

**Victimization by bullying and non-bullying aggression: An evolutionary
psychological perspective**

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Psychology

Submitted in partial fulfilment
of the requirements for the degree of
Master of Arts

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Abstract

Using an evolutionary psychological perspective, I investigated the correlates of two kinds of peer victimization with differential power relations between the perpetrator and victim. Bullying is goal-directed aggression towards an individual with less power than the perpetrator. In contrast, non-bullying aggression is aimed towards an individual of equal or greater power than the perpetrator. Specifically, I examined the relation between psychosocial vulnerability and evolutionary advantages with both types of victimization. A total of 627 adolescents aged 9-14 years ($M = 11.93$; $SD = 1.40$) completed self-report and peer nomination measures. Indicators of psychosocial vulnerability included emotional problems and fewer close friendships. Evolutionary advantages were assessed by measuring peer-nominated physical attractiveness, dating popularity, perceived popularity, and respect by others. Victimization by bullying was not related to psychosocial vulnerability, but was negatively associated with physical attractiveness, perceived popularity, and respect. As predicted, victimization by non-bullying aggression was positively associated with all four evolutionary advantages. The results demonstrate the importance of measuring the power relation between the perpetrator and victim when studying peer victimization. Adolescents victimized by those with greater power may be targeted due to the vulnerability of having fewer evolutionary advantages. In contrast, adolescents victimized by those of equal or less power may be targeted due to competition and rivalry, insofar as they possess greater evolutionary advantages than their peers, which mark them as rivals.

Keywords: Victimization by bullying, Victimization by non-bullying aggression, Power balance, Evolutionary psychology, Psychosocial vulnerability

Acknowledgements

Firstly, I would like to express my gratitude to my research supervisor, Dr. Drew Dane, whose patience, knowledge, and guidance over the past two years have been invaluable. Thank you for your continuous confidence in me and for providing me with a positive and encouraging environment to learn in. I would also like to thank my committee members, Dr. Tony Volk and Dr. Angela Book for their advice, feedback, and continuous support throughout my thesis. I would also like to thank my external examiner, Dr. Heather Chalmers, for her thoughtful and interesting questions which helped me think about my research with a more critical lens.

I would also like to thank my lab mates for helping collect the data used for my thesis and for making my graduate experience fun and memorable. A special thank you to Natalie, Kiana, and Hannah for helping me prep for my thesis defence. I would also like to thank my classmates for their camaraderie and support over the past two years.

Finally, this accomplishment would not have been possible without my strong support system. Thank you to my family and friends for their patience, compassion, generosity, and kindness. Thank you to my parents and brother for always believing in me and motivating me to achieve my dreams. Thank you to my friends for always lending me an ear and making me laugh when I was stressed. I am grateful for everyone in my life who has helped make this experience rewarding.

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Introduction

Victimization by aggression is a common phenomenon occurring within peer groups, which has detrimental consequences to an individual's psychosocial adjustment and well-being. Peer victimization is associated with many negative consequences and psychological maladjustment, including anxiety, depression, psychosocial maladjustment, loneliness, peer rejection, drug use, delinquency, and poor academic performance (Craig, 1998; Juvonen, Nishina, & Graham, 2000; Nakamoto & Schwartz, 2010; Stapinski, Araya, Heron, Montgomery, & Stallard, 2015; Sullivan, Farrell, & Kliewer, 2006). Although many youths have reported being victimized at least once in their life, approximately 10 - 20% of youth experience chronic victimization (Craig et al., 2009; Storch & Ledley, 2005). Those who are repeatedly victimized experience more debilitating consequences than those who face victimization occasionally (Ybarra et al., 2014). Understanding the risk factors for victimization and how aggressors select their victims may aid in developing interventions to decrease peer aggression in schools and communities.

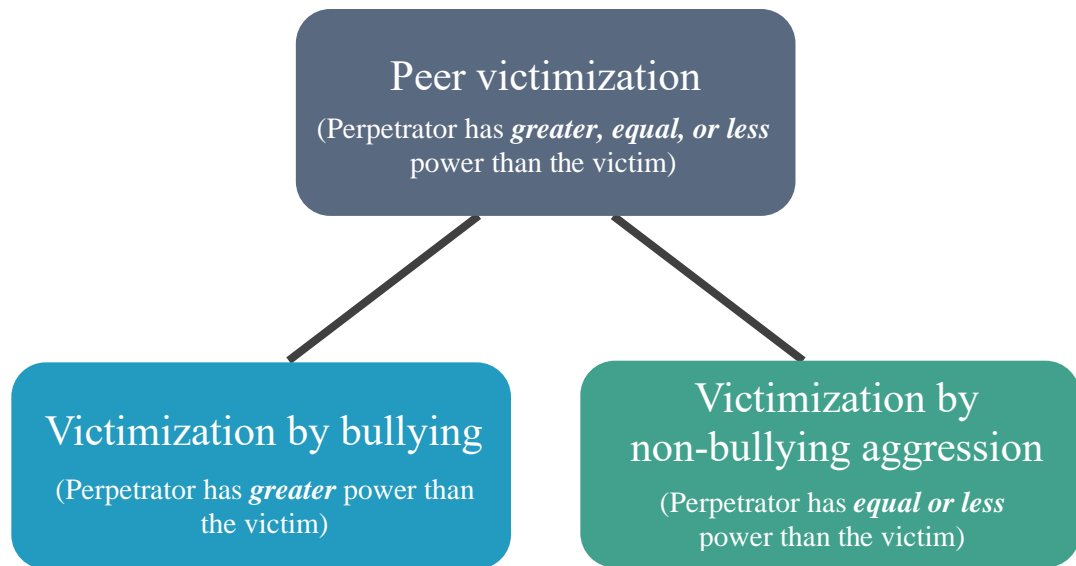
Peer victimization has often been studied by examining the form of aggression perpetrated against the victim and the frequency of victimization (Gallup et al., 2009; Gradinger et al., 2012). Children and adolescents can be victimized by direct and indirect forms of aggression. Direct forms of aggression are those where the aggressor clearly confronts the victim and include physical (e.g., hitting, kicking, damaging possessions) and verbal acts (e.g., verbal insults and threats). Indirect forms of aggression are those where the aggressor does not directly confront the victim and include relational (e.g., spreading malicious rumours, social exclusion) and cyber attacks (e.g., using the internet

to insult or spread rumours, posting embarrassing or hurtful pictures; Card et al., 2008; Lapierre & Dane, 2020). Although both direct and indirect forms of aggression are exhibited by children as young as kindergarten (Kochenderfer & Ladd, 1996; Renouf et al., 2009), research suggests children shift from using direct forms of aggression to more indirect forms during middle childhood to preadolescence (Björkqvist et al., 1992; Cleverley et al., 2012; Côté et al., 2007). Once children enter preadolescence, social networks become more intimate which provides opportunities to manipulate social relationships (Björkqvist et al., 1992). Furthermore, sex segregation decreases during this time in development as early adolescents become interested in romantic relationships (Neal, 2007). This adds an extra dimension and motivation to manipulate social relationships.

The power balance between the perpetrator and victim is often not measured when studying general peer victimization (Gallup et al., 2009; Sheppard et al., 2019; Sullivan et al., 2006; van Geel et al., 2018). The power imbalance typically is only focused on in research examining the effects of bullying. Bullying is a type of peer aggression where the aggressive behaviour is goal-directed and perpetrated by someone of greater power than the victim (Olweus, 1993; Volk et al., 2014). The nature of victimization defined by other power relations is unclear. Non-bullying aggression refers to intentional aggression perpetrated by an individual with equal or less power than the victim (Lapierre & Dane, 2020). Figure 1 provides a summary of the definitions used in my thesis for the following victimization terms: peer victimization, victimization by bullying, and victimization by non-bullying aggression.

Figure 1

Definitions for victimization terms



It is important to examine similarities and differences in risk factors for victimization by bullying versus non-bullying aggression to understand which individuals will be targeted. The purpose of my thesis was to differentiate the correlates of victimization by bullying from those of victimization by non-bullying aggression with the aim to better understand the risk factors leading to each type of victimization. To understand these risk factors, I believe that it is important to understand why adolescents choose to engage in aggression and what adaptive outcomes they can obtain.

Evolutionary Psychological Perspective of Aggression and Victimization

Aggression as an Evolved Adaptation

Theories of evolutionary psychology suggest that aggression may have evolved to solve a multitude of adaptive problems, such as co-opting resources from others, deterring rivals from future aggression, defending against attack, negotiating power

hierarchies, and inflicting costs on intrasexual rivals (Buss & Shackelford, 1997). Some researchers suggest that adolescents may engage in aggression to solve similar problems among their peer groups (Volk et al., 2012). For example, aggression used as a means for establishing one's position in the dominance hierarchy becomes especially apparent during transitions from childhood to adolescence when young adolescents enter middle or high school. Research suggests that boys report higher levels of physical aggression at the start of middle school, which then declines throughout the year (Pellegrini & Long, 2003; Pellegrini & Bartini, 2001). These findings suggest that early adolescents use aggression to establish dominance hierarchies when transitioning into a new school and academic year with a new peer group, which may aid in deterring future aggression from rivals later on throughout the year.

Additionally, adolescent boys who were more aggressive at the start of the term were more likely to be involved in dating relationships later in the year, indicating the adaptive outcomes associated with aggression in adolescence (Pellegrini & Bartini, 2001). Adolescent girls who reported high levels of indirect aggression were more likely to start dating at earlier ages and report a greater number of dating and sexual partners, whereas adolescent boys who reported high levels of indirect aggression were more likely to report a greater number of dating and sexual partners (Dane et al., 2017; Gallup et al., 2011; Lapierre & Dane, 2020).

Furthermore, those who possess greater power may be better able to use aggression to achieve their goals, which is why bullying has been associated with evolutionary advantages such as reputation, reproductively relevant outcomes, and resource control (Volk et al., 2014). The power imbalance between the perpetrator and

victim is an inherent property of bullying. Adolescents with greater power often target those of lower power to maintain their dominance and position within the social hierarchy. Although it seems counterintuitive that a powerful individual can maintain their dominance by aggressing against their weaker peers, evolutionary theories of dominance signalling suggest otherwise (Volk et al., 2014). Specifically, theories on dominance signalling suggest that bullies are likely to target individuals of lesser power in front of their peer group in order to signal their dominance to their other peers (Cronk, 2005; van der Ploeg et al., 2020; Volk et al., 2014). These demonstrations of aggression allow the perpetrator to cultivate an aggressive and tough reputation that can deter rivals from future aggression (Archer & Benson, 2008). Potential rivals are less likely to challenge these individuals after viewing the defeat of their fellow peers. Research indicating that adolescent bullies tend to engage in aggression in front of an audience support this theory that these aggressive acts could simply be a way to signal their dominance, deter future aggression, and maintain their position in the dominance hierarchy (Salmivalli, 2010). Adolescents who are nominated by their peers as bullies are also nominated for having high perceived popularity among their peer group (Cillessen & Mayeux, 2004; Juvonen et al., 2003). Popular adolescents have a high degree of influence among their peer group making it a valuable goal to strive for (Cillessen & Rose, 2005).

Sex Differences in Aggression

Darwin's (1871) theory of sexual selection refers to the choice of members of one sex by members of the opposite sex, as well as competition between members of one sex for access to mating opportunities with the opposite sex. According to this theory, both males and females compete with members of their own sex for reproductive access to the

opposite sex. As previously mentioned, aggression may be an evolved adaptation for both males and females as it can be used to inflict costs upon one's rivals when competing for mates. However, Trivers (1972) suggests that the frequency and form of aggression is likely to differ between males and females, depending on their level of parental investment for their offspring. Specifically, parental investment theory suggests that the sex who offers greater parental investment for the survival of their offspring is providing a valuable and limited resource, which members of the opposite sex will compete to obtain (Trivers, 1972). Female mammals provide greater parental investment for their offspring than their male counterparts (Trivers, 1972). Gestation, nourishment, lactation, feeding, and protection are examples of the high degree of parental investment women provide in order to ensure the survival of their offspring until reproductive age (Buss & Schmitt, 1993). According to this theory, men will engage in greater intrasexual competition in order to obtain this valuable resource to ensure their reproductive success. In addition to using aggression to inflict costs upon rivals in intrasexual competition, men's aggression can also be used to obtain dominance and resources that are highly preferred by women seeking a long-term mate (Archer, 2009; Campbell, 2013).

Parental investment theory also suggests that women are less likely to engage in physical aggression because they are more averse to risks, such as death and physical injury (Trivers, 1972). Considering women's high parental investment, maternal survival is a key predictor for the survival of their offspring. By engaging in physical aggression, women put themselves at risk for injury or death which could be detrimental to the survival of their offspring. Indirect aggression, on the other hand, can be used anonymously and discreetly, which decreases the aggressor's risk of identification and

subsequent retaliation (Vaillancourt, 2013). Furthermore, the potential anonymity of indirect aggression allows the perpetrator to deny accusations or skillfully argue their intention to harm to avoid the risk of retaliation. Even if anonymity is not achieved, retaliation will most likely take the same form of indirect aggression, which is less likely to physically harm the victim in comparison physical aggression.

Costs of Aggression

Despite the adaptive outcomes, bullying is still considered to be an antisocial behaviour which may not always be accepted by the peer group. For example, although adolescent bullies are perceived to be popular and possess high social status, they do not receive many nominations for social acceptance and peer liking (de Bruyn et al., 2010). In order to maximize the rewards and minimize the costs associated with aggression, bullies are selective when choosing their target. Bullies minimize the costs by selecting a weaker individual who is less likely to successfully retaliate back and someone who is rejected by their peers so that the bully does not lose the affection of their peers (Olweus, 1978; Schwartz et al., 2001; Veenstra et al., 2010). These are important risk factors to consider when examining which children and adolescents are at greater risk of victimization by bullying.

Victimization by Bullying

A plethora of research has examined whether victims of bullying share similar characteristics, with the hope of establishing potential predictors and risk factors of victimization. Main areas of focus include emotional maladjustment, behavioural problems, and social vulnerability.

Internalizing and Externalizing Problems

Internalizing problems encompass a range of symptoms, such as loneliness, withdrawal, depression, anxiety, and somatic complaints (Reijntjes et al., 2010). These symptoms are often found in children and adolescents who experience peer victimization and victimization by bullying. Many studies have examined whether internalizing problems are antecedents or consequences of peer victimization (Reijntjes et al., 2010). Peer abuse and victimization has harrowing consequences on an individual's development and psychosocial adjustment. Chronic victimization can debilitate an individual's self-esteem and ability to cope with daily social demands, leading to internalizing symptoms, such as depression and anxiety (Stapinski et al., 2015). However, a reciprocal relationship between victimization and internalizing problems also exists, in that adolescents who are withdrawn, anxious, and fearful are at risk for victimization (Veenstra et al., 2007). Bullies may target these adolescents because their internalizing symptoms suggest an inability to defend themselves and effectively fight back when harassed. Overall, research suggests that a bidirectional relationship exists between peer victimization and internalizing problems in children (Reijntjes et al., 2010). Withdrawn and fearful children may be more vulnerable to victimization, which may lead to the maintenance or exacerbation of further internalizing symptoms, initiating a vicious cycle (Hodges & Perry, 1999).

Children with externalizing problems may also be at risk for victimization for different reasons than their peers with internalizing problems. Externalizing problems can be characterized by symptoms of hyperactivity, impulsivity, disruptiveness, and aggression, and these characteristics often provoke maltreatment from their peers (Hodges et al., 1999). Due to their emotional dysregulation and externalizing behaviours,

these children unintentionally invite conflicts with their peers which may lead to peer victimization (Schwartz et al., 2001). Social information processing theory suggests that some youths may exhibit deficits when processing social information and demonstrate a hostile attribution bias (Crick & Dodge, 1994). This bias refers to a tendency to attribute hostile intent to ambiguous social interactions. Children who demonstrate a hostile attribution bias are more likely to act aggressively during peer interactions which may provoke others, leading to retaliation and subsequent victimization. These children are often characterized as aggressive victims, as they are often involved in aggressive behaviour and experience victimization (Schwartz et al., 2001). A meta-analysis examining the link between externalizing problems and peer victimization demonstrated that externalizing problems were both an antecedent and a consequence of peer victimization (Reijntjes et al., 2011). Recurrent peer victimization is a stressful experience which may cause children and adolescents to act out behaviourally or develop aggressive tendencies as a way to defend themselves from future attack. Overall, research suggests that there are reciprocal links between peer victimization and internalizing or externalizing problems, often creating a vicious cycle (Reijntjes et al., 2010, 2011). Regardless of whether these issues arose before or after initial peer victimization, the presentation of internalizing and externalizing problems makes children and adolescents vulnerable to future occurrences of victimization by bullying.

Social Vulnerability

Victims of bullying are more likely to be rejected by their peers, socially vulnerable, and have fewer close friendships (Bollmer et al., 2005; Veenstra et al., 2007). Although adolescents who present with internalizing and externalizing behaviours are

more likely to be targeted by bullies, their chance of victimization decreases for those who have a best friend, especially a best friend who can provide high protection for the potential victim (Hodges et al., 1999). This research suggests close friendships protect adolescents from victimization because they will be less socially vulnerable. Bullies are also less likely to select targets with friends who offer high protection (Hodges et al., 1999), suggesting that bullies target isolated and socially vulnerable individuals because there is a smaller likelihood of retaliation.

In addition to choosing isolated and socially vulnerable targets, bullies also select victims who are rejected by their peers (Veenstra et al., 2007). Rejected adolescents may not gain much sympathy from their peers when they are victimized, and therefore bullies do not lose social approval by selecting these individuals for victimization. Bullies strategically target rejected adolescents to signal their dominance and exert their power without risking their reputation and losing social approval from their peers (Veenstra et al., 2007). Veenstra and colleagues (2010) suggest that bullies likely split their peer group by those who may provide them with affection versus those they can dominate because their sources of affection do not care for these rejected peers. Specifically, bullies were more likely to victimize their peers who were rejected by their same gender peers in middle childhood (Veenstra et al., 2010). This makes sense because at this age, children are more likely to be friends with peers of their same gender. Therefore, by selecting targets who are rejected by same gender peers, bullies are less likely to lose their affection and social approval. Bullies also select vulnerable victims characterized by fearfulness and isolation to lower their chances of retaliation which could threaten their social dominance and status (Veenstra et al., 2007).

Although peer rejection has been found to be a risk factor for victimization, not all rejected adolescents are victimized by their peers. It seems that possessing characteristics highly valued by your peers moderated the relation between peer rejection and victimization (Knack et al., 2012). Specifically, rejected adolescents who lack peer-valued characteristics, such as physical attractiveness, wealth, athletic competence, and academic ability, were more likely to be victimized by their peers (Knack et al., 2012). Characteristics and competencies which are highly valued by the peer group have been found to be correlated with popularity (Vaillancourt & Hymel, 2006). Lacking these peer-valued characteristics may indicate that individual's vulnerability and put them at risk for victimization.

Victimization due to Competition and Rivalry

Another reason to why adolescents may be targeted by aggression is for competition and rivalry. Specifically, it seems that adolescents who possess certain evolutionary advantages such as high social status and dating popularity may be at risk for non-bullying victimization because they are seen as a rival.

Social Status

Adolescents who are rejected by their peers and have low social status are not the only individuals at risk for victimization. A small body of literature has found that high-status adolescents are also at risk for victimization, but for different reasons than their rejected peers (Closson et al., 2017; de Bruyn et al., 2010; Prinstein & Cillessen, 2003). Prinstein and Cillessen (2003) found a U-shaped curve when examining the relation between popularity and victimization, in that both adolescents with low and high levels of popularity experienced greater levels of reputational victimization. Adolescents with high

perceived popularity often possess admirable qualities and high influence over their peers, which may evoke envy from their lower status or other high-status peers. Victimization of high-status peers seems to arise from competition and rivalry. Popular adolescents with high peer conformity goals are at even greater risk of reputational victimization, suggesting that these adolescents may possess peer-valued characteristics which evoke envy from their peers (Closson et al., 2017). Reputational aggression consists of spreading rumours and gossip with the intention of ruining an individual's reputation. By derogating the reputation of a high-status peer, adolescents with lower social status have the opportunity to diminish the status of their target and ascend the social hierarchy themselves. Although perceived popularity often predicts aggression, there is evidence that the reciprocal relation also exists, especially for relational aggression (Cillessen & Mayeux, 2004). Relational aggression may be used by adolescents to achieve social dominance, influence, and perceived popularity among their peer group (Mayeux, 2014). However, targeting peers with high status and power can be risky for the aggressor if their identity is revealed. Relational or reputational aggression can be covert and anonymous which decreases the aggressor's risk of identification and subsequent retaliation.

Intrasexual Competition

In addition to competing for high status and power, adolescents may also engage in aggression to compete for mates. Intrasexual competition occurs when members of the same sex compete with each other for mating opportunities. Two strategies of intrasexual competition include methods to enhance one's own appeal to attract mates, as well as methods to decrease the attractiveness and appeal of their rivals (Buss, 1988; Fisher &

Cox, 2011). Aggressive tactics, such as derogation and inflicting harm on rivals, are one way to diminish the attractiveness of one's competitors. Approximately 85% of peer victimization is perpetrated by members of the same sex (Gallup et al., 2009), which suggests that the majority of peer aggression may be due to intrasexual competition. Adolescents who have greater access to mates or possess more qualities to attract mates may be seen as rivals in intrasexual competition and are at risk of victimization (Dane et al., 2017; Lapierre & Dane, 2020; Leenaars et al., 2008; Polo et al., 2018; Vaillancourt & Sharma, 2011). The association between victimization and dating or sexual experiences differ for males and females. Female adolescents who report a greater number of sexual partners and an earlier age of their first sexual experience are more likely to be victimized by their peers (Dane et al., 2017; Gallup et al., 2009). This research suggests that females with earlier or greater sexual experiences are more likely to be seen as rivals in intrasexual competition and evoke victimization by peers who want to weaken their chances for mating opportunities.

Even characteristics that increase a female's chances to attract mates evoke rivalry from other females. For example, physical attractiveness, slimmer body types, and provocative clothing are all characteristics which indicate high mate value or a greater ability to attract attention from males (Buss, 1989). Therefore, women who possess these qualities are at greater risk of victimization, especially by indirect aggression (Leenaars et al., 2008; Vaillancourt & Sharma, 2011). An experimental study, conducted by Vaillancourt and Sharma (2011), examined whether females would engage in intrasexual competition by derogating rivals who possessed characteristics more likely to attract males. When introduced to an attractive female research assistant wearing provocative

clothing versus conservative clothing, female participants were more likely to disparage this woman by expressing avoidant behaviour, sarcasm, and negative facial expressions, such as disgust and eye rolling in the provocative clothing condition (Vaillancourt & Sharma, 2011). This experimental paradigm demonstrated how females were more likely to victimize other females when they were dressed provocatively in comparison to when dressed conservatively. Considering that men highly value attractiveness in a potential mate, it follows that women are more likely to identify attractive women as their rivals in mate selection and may engage in tactics, such as indirect aggression, to decrease their mating opportunities (Buss, 1989; Vaillancourt, 2013).

Indirect aggression can be a useful strategy to facilitate intrasexual competition since it involves damaging the reputation of rivals through spreading rumours, disparaging, and making accusations of promiscuity and infidelity. These rumours and accusations may weaken the rival's chance at attracting mates or even turn away current partners. Men are more likely to be influenced by negative statements about a woman's attractiveness in comparison to positive or neutral statements, especially when these statements were provided by an attractive woman. Specifically, when an attractive woman derogated the physical appearance of another woman, men were more likely to decrease their rating of attractiveness as well (Fisher & Cox, 2011). This research demonstrates the usefulness of indirect aggression in the form of derogation tactics when women attempt to decrease the mate value of their rivals in intrasexual competition.

Additionally, the negative consequences from indirect victimization, such as anxiety and depression, may weaken the rival's ability to compete for mates, which provides more opportunities for the aggressor (Craig, 1998; Stapinski et al., 2015;

Vaillancourt, 2013). Indirect aggression inflicts harms upon its victims and lowers their self-esteem which could debilitate their ability or willingness to compete for dating and sexual partners (Salmivalli et al., 1999; White et al., 2010). Cyber aggression is a form of indirect aggression which women find to be more harmful than men (Wyckoff et al., 2019).

These findings regarding intrasexual competition are not consistent across gender. Associations between number of sexual partners and victimization for males differ across studies. For example, male adolescents who report a greater number of sexual partners were more likely to be victimized; a finding which is consistent with females (Leenaars et al., 2008). However, other research demonstrates a negative correlation between peer victimization and number of sexual partners in adolescence, such that male adolescents who are targeted by peer aggression have a lower number of sexual partners throughout their lifetime (Gallup et al., 2009). Furthermore, contrary to females, physical attractiveness seems to be a protective factor against victimization for male adolescents (Leenaars et al., 2008). This research suggests that either physical attractiveness is not a threat in intrasexual competition for males, or that attractive males have other characteristics which may deter rivals from targeting them. From an evolutionary perspective, height has been found to be a more salient characteristic in mate selection for men as it has been found to be associated with physical strength and aggression (Archer & Thanzami, 2007; Polo et al., 2018). From an evolutionary psychological perspective, when selecting a long-term mate, women seek men who are able to protect and provide for their offspring and physical strength is a good indicator of a man's ability to do so. A negative association between height and intrasexual competition in men suggest that

shorter men are more likely to engage in intrasexual competition because they feel threatened by their prospects in mate selection (Polo et al., 2018). Taller men may be less likely to engage in intrasexual competition because they already possess a physically attractive trait which gives them an advantage when attracting mates (Polo et al., 2018).

In summary, adolescents may be motivated to use aggression against those of equal or greater power than themselves as a strategy to negotiate power and status hierarchies, engage in intrasexual competition, or even retaliate to demonstrate that they will not be an easy target. Therefore, another group of individuals who are at risk of victimization are those who have power and other characteristics which evoke envy and competition.

Purpose of Thesis

The literature examining peer victimization reveals two trends as to why victims may be targeted. The first line of research suggests that victims may be selected due to risk factors of psychosocial vulnerability, such as internalizing problems, externalizing problems, few close friendships, and rejection from peers. Individuals characterized by psychosocial vulnerability may be at risk of victimization because they are less likely to retaliate and lack protection due to fewer close friendships. Furthermore, perpetrators are more likely to select rejected peers to dominate as it minimizes any losses of social approval or affection from peers. Therefore, individuals characterized by psychosocial vulnerability unwillingly present themselves as easy targets for their peers of higher status to victimize and dominate.

The second line of research presents a different trend and suggests that a subset of adolescents is being targeted for having evolutionary advantages, such as high social

status, reproductively relevant characteristics, and greater access to dating and sexual partners. Rather than being an easy target to dominate, it seems that these individuals are targeted due to rivalry and competition. Aggression may be used against these individuals because they are seen as a rival in intrasexual competition or to negotiate status hierarchies. As outlined, the literature presents two different groups of children and adolescents who are at risk for victimization for different reasons. My thesis will examine whether these two different categories of risk factors can be differentiated by the power balance between the perpetrator and the victim.

The purpose of my thesis is to examine the correlates associated with victimization by bullying and victimization by non-bullying aggression. Specifically, I will investigate whether individuals are targeted by bullying due to indicators of psychosocial vulnerability and a lack of evolutionary advantages, and whether individuals are targeted by non-bullying aggression due to possessing evolutionary advantages.

Hypotheses and Predictions

My thesis examines four main research questions. First, how are indicators of psychosocial vulnerability associated with victimization by bullying and non-bullying aggression? Given that the literature has demonstrated that adolescents target their psychosocially vulnerable peers due to their lack of power to retaliate and social rejection, I predicted that indicators of psychosocial vulnerability would be positively associated with victimization by bullying aggression.

The second research question explores how evolutionary advantages of status and reproductively relevant indicators are associated with victimization by bullying and

non-bullying aggression. I predict evolutionary advantages to be negatively associated with victimization by bullying. Lacking evolutionary advantages related to status and reproductively relevant characteristics (such as physical attractiveness and dating popularity) may indicate that these individuals are not held in high esteem by their peers. Therefore, bullies, who seek to minimize the loss of peer affection, may be more likely to target their peers with fewer evolutionary advantages. I also predict evolutionary advantages to be positively associated with victimization by non-bullying aggression. Previous research suggests that adolescents with high social status and access to dating opportunities are often targeted due to competition and rivalry. Adolescents may aggress against their peers of equal or higher power than themselves to negotiate status hierarchies and inflict costs upon rivals in intrasexual competition. I also predict that the positive association between evolutionary advantages and victimization by non-bullying aggression to be more strongly associated with indirect forms of victimization in comparison to direct forms of victimization. Additionally, I predict that the positive association between reproductively relevant evolutionary advantages (physical attractiveness and dating popularity) and victimization by non-bullying aggression will be more strongly associated for females than for males.

Methods

Participants

A sample of 708 participants (300 boys and 324 girls) between the ages 9 to 14 years old ($M = 11.92$; $SD = 1.39$) had permission to participate in the study. Participants were recruited from five elementary schools and one high school in Southern Ontario, Canada. Of these 708 participants, 61 participants were absent, 15 participants provided

late consent, and 5 participants only completed the self-report surveys due to technical difficulties. Analyses were conducted on the remaining 627 participants (287 males and 312 females) between the ages 9 to 14 years ($M = 11.93$; $SD = 1.40$). Within this sample, approximately 56% of participants identified as White, 13% of participants identified as Mixed, 2% of participants did not identify an ethnicity, and the remaining 29% of participants identified other groups of diverse ethnicities, including East Asian, Southeast Asian, South Asian, West Asian or Arab, South American, Native Canadian, Black African/Caribbean/Canadian/American, Native Canadian, and Other. Within this sample, 18 participants were not provided peer nomination questions about dating and physical attractiveness at the request of the school principal to not provide these questions to grade 5 students. These individuals were not included in analyses examining dating popularity and physical attractiveness.

Procedure

With approval from the Research Ethics Board at Brock University, and that of the school board, participants in grades 5 to 8 were recruited from 5 elementary schools and participants in grade 9 were recruited from 1 high school in Southern Ontario, Canada. A couple weeks prior to visiting elementary schools for data collection, students were verbally introduced to the study and provided with a package containing a description of the purpose of the study, as well as forms for parental consent (Appendix A). In the consent forms, students and their parents were ensured that responses would be kept confidential and they were allowed to withdraw from the study at any time without penalty. An average of 77% of students from grade 5 to 8 provided consent to participate in elementary schools. Schools were compensated \$5-10 for each consent form signed

and returned to the school, regardless of whether the student provided consent or not. For each consent form returned, schools that reached a minimum consent rate of 85% received \$10 per student, and schools that reached a consent rate lower than 85% received \$5 per student. Students who brought back their consent form were entered in a draw for the chance to win gift cards that equalled \$10 per returned consent form. Similar to elementary schools, our research team described the purpose of the study to grade 9 students at the high school prior to conducting the study. Passive consent was permitted to be used with grade 9 students, so parental consent forms were not required. Parents were informed that they could ask for their child to be excluded from the study, although none of the parents chose this option. On the day of data collection, assent was obtained from all elementary and high school students before they were allowed to participate in the study. Participants were also provided with a debriefing form describing the intention of the study, confidentiality, and contact information to keep in their records (Appendix B for elementary school participants; Appendix C for secondary school participants).

Researchers visited the schools and provided both self-report and peer nomination measures for participants to answer electronically on tablets. Peer nomination measures allowed participants to nominate other students in their grade also participating in the study. For participants in elementary schools, nomination rosters for each grade included the names of students with permission to participate in the study. Participants were allowed to nominate as many people as they wished for each item, including no one. For participants in high school, they were provided with a list of students in their grade. For each peer nomination question, participants in high school were allowed to nominate 0 to

10 peers. All nominations were standardized for each grade in each school to allow comparisons across all grades and schools.

Materials

The participants completed both self-report and peer nominations measures. Self-report measures included the demographic questionnaire (Appendix D) and the Emotional Problems subscale of the Strengths and Difficulties Questionnaire (Goodman, 1997; Appendix E). Peer nominations measures include nominations of victimization by bullying aggression, victimization by non-bullying aggression, close friendships, physical attractiveness, dating popularity, perceived popularity, and respect.

Victimization Measures

Victimization by bullying was measured by nominations for the question, “Who is someone who is less popular or strong than you, who you have done these things to?”. Those who were nominated were identified as victims of bullying. This question was asked separately for direct forms and indirect forms of aggression. Examples of both forms of aggression were listed for participants (Appendix F). Direct forms of aggression included examples of physical (i.e., “hitting, kicking, shoving, using physical force”) and verbal aggression (i.e., “threatening or saying mean things”). Indirect forms of aggression included examples of relational (i.e., “spreading negative rumours, leaving you out of a group activity”) and cyber aggression (i.e., “using a cell phone or internet to send or post hurtful or embarrassing things to someone, or about someone”). Victimization by non-bullying aggression was measured using nominations for the question “Who is someone who is equally or more popular or strong than you, who you have done these things to?”.

Participants were specifically asked about direct and indirect forms of aggression separately, as above for victimization by bullying.

Psychosocial Vulnerability

Psychosocial vulnerability was assessed by measuring emotional vulnerability and close friendships. Emotional vulnerability was measured using the emotional problems subscale in the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), a self-report measure. The emotional problems subscale consists of 5 items (e.g., “I have many fears. I am easily scared.”; $\alpha = .75$). Participants were asked to read and rate each item as being “not true”, “somewhat true”, and “certainly true”. A composite was created averaging responses for all 5 items in the emotional problems subscale of the SDQ. Close friendship was measured using the number of reciprocal peer nominations of best friends (“Who are your best or closest friends?”). This number was then standardized within each grade for each school.

Evolutionary Advantages

Evolutionary advantages were assessed with peer nominations for physical attractiveness (“Who is good looking?”), dating popularity (“Who would you most like to go on a date with?”), perceived popularity (“Who are the most popular people in your grade?”), and respect (“Who do others look up to and respect?”). The number of nominations for each question was then standardized within each grade for each school.

Plan of Analysis

To test the hypotheses for the study, 12 multiple linear regressions were conducted in total. Firstly, indicators of psychosocial vulnerability (emotional problems and close friendships) and evolutionary advantages (physical attractiveness, dating

popularity, perceived popularity, and respect) were each regressed on direct victimization by bullying and direct victimization by non-bullying aggression. This resulted in 6 multiple regression analyses. Secondly, indicators of psychosocial vulnerability (emotional problems and close friendships) and evolutionary advantages (physical attractiveness, dating popularity, perceived popularity, and respect) were each regressed on indirect victimization by bullying and indirect victimization by non-bullying aggression. This resulted in 6 additional multiple regression analyses. For each analysis, age, gender, and socioeconomic status were included as covariates. To reduce familywise error, only effects significant at a p-value of equal or less than .01 were interpreted.

I followed procedures outlined by Aiken and West (1991) to examine interactions among victimization variables and either gender or age. After entering age, gender, and socioeconomic status as covariates in the first step, victimization by bullying and victimization by non-bullying aggression were entered into the second step. At the third step, two-way interactions between both victimization variables, and two-way interactions between each victimization variable and sex or gender were entered. At the fourth step, three-way interactions between both victimization variables and age or gender were entered. Significant age interactions with a s^2 value greater than .01 were interpreted by examining the relation of the victimization variable and dependent variable at values of age that fell 1 SD below and 1 SD above its mean. For significant gender interactions, the relation between the victimization variable and dependent variable were examined for males and females.

Results

Preliminary Analyses

Descriptive statistics of the independent, covariate, and dependent variables are presented in Table 1. To assess assumptions of normality, an examination of the skewness and kurtosis values in descriptive statistics revealed that indirect victimization by bullying, indirect victimization by non-bullying aggression, and dating popularity were positively skewed. Since histograms revealed that these variables were positively skewed due to extreme outliers, the variables were Winsorized to 3 standard deviations from the mean which resulted in relatively normal distributions (Field, 2013). To assess assumptions of linearity and homoscedasticity, the standardized residuals were plotted for each of variable. Visual examination of these plots revealed that both assumptions were met. Correlational analyses between independent, covariate, and dependent variables are presented in Table 2. The predictor variables for the regression analyses were not highly correlated, suggesting that the assumption of multicollinearity was met. Furthermore, for

Table 1

Descriptive statistics for independent, covariate, and dependent variables

Variable	M	SD	Range
Age	11.93	1.40	9 - 14
Socioeconomic status	3.02	.72	1 - 5
Direct victimization by bullying	-0.02	0.96	-1.51 – 6.04
Indirect victimization by bullying	0.00	0.98	-1.58 – 6.06
Direct victimization by non-bullying aggression	0.00	0.98	-1.16 – 5.7
Indirect victimization by non-bullying aggression	-0.02	0.95	-1.72 – 6.73
Emotional problems	1.78	0.53	1 - 3
Best friends	0.00	0.98	-2.43 – 2.97
Physical attractiveness	-0.01	0.96	-1.88 – 4.73
Dating popularity	-0.02	0.95	-0.87 – 5.25
Perceived popularity	0.00	0.97	-1.54 – 4.79
Respected by others	0.00	0.99	-2.21 – 6.10

Table 2*Correlations between independent, covariate, and dependent variables*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Age	1												
2 Gender	-.12**	1											
3 SES	.05	-.11**	1										
4 DVB	-.01	-.14***	.06	1									
5 IVB	.00	.02	.09*	.48***	1								
6 DVNB	.00	-.18***	.13***	.46***	.33***	1							
7 IVNB	-.01	-.03	.03	.32***	.35***	.52***	1						
8 EP	.04	.29***	-.15***	-.05	-.01	-.07	.00	1					
9 CF	.01	.17***	.07	-.10*	-.06	-.03	-.04	.02	1				
10 PA	.01	.11*	.06	-.05	.02	.14***	.11**	-.06	.37***	1			
11 Date	-.01	-.04	.07	.01	.02	.11**	.09*	-.04	.18***	.66***	1		
12 Popular	-.01	-.09*	.14***	.06	.11**	.40***	.26***	-.11*	.28***	.63***	.42***	1	
13 Respect	-.01	.15***	.04	-.18***	-.10*	.02	-.02	-.03	.45***	.54***	.34***	.53***	1

Note: SES = Socioeconomic status, DVB = Direct victimization by bullying, IVB = Indirect victimization by bullying, DVNB = Direct victimization by non-bullying aggression, IVNB = Indirect victimization by non-bullying aggression, EP = Emotional problems, CF = Close friendship; PA = Physical attractiveness.

*** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$

all regression analyses, predictors revealed a tolerance values over .02 and a variance inflation factor (VIF) less than 10 (Menard, 1995; Myers, 1990). For the following analyses, age, and socioeconomic status were centered at the mean.

Direct Forms of Victimization by Bullying and Non-bullying Aggression

Psychosocial Vulnerability

To examine the relation between psychosocial vulnerability and direct victimization variables, close friendship and emotional problems were regressed on direct victimization by bullying and non-bullying aggression. The results of these two regression analyses are presented in Table 3. No main effects of close friendship or emotional problems were found on either direct victimization variable. Analyses did not reveal any two-way or three-way interactions with age or gender.

Evolutionary Advantages

Next, I conducted multiple regression analyses to examine the relation between evolutionary advantages and direct victimization variables. Specifically, physical attractiveness, dating popularity, perceived popularity, and respect were regressed on direct victimization by bullying and non-bullying aggression. The results of these four regression analyses are displayed in Table 4. The results indicated that direct victimization by non-bullying aggression was positively associated with all four indicators of evolutionary advantages. Specifically, when controlling for age, gender, socioeconomic status (SES), and direct victimization by bullying, direct victimization by non-bullying aggression was positively related to attractiveness, dating popularity, perceived popularity, and respect. Direct victimization by non-bullying aggression explained more variance in perceived popularity (16%) than attractiveness (4%), dating

Table 3*Direct victimization by bullying and non-bullying aggression in relation to psychosocial vulnerability*

Predictors	β	Close friendship		β	Emotional problems	
		s_r^2	R^2		s_r^2	R^2
Step 1			.04			.11
Age	.04	.00		.09*	.01	
Gen	.20***	.04		.30***	.09	
SES	.09*	.01		-.10*	.01	
Step 2			.05			.11
VicB	-.09*	.01		-.02	.00	
VicNB	.05	.00		.00	.00	
Step 3			.06			.13
Gen*VicB	-.04	.00		.07	.00	
Gen*VicNB	.00	.00		.11	.01	
Age*VicB	.03	.00		-.07	.00	
Age*VicNB	-.01	.00		-.05	.00	
VicB*VicNB	-.09	.00		.06	.00	
Step 4			.06			.14
Gen*VicB*VicNB	.06	.00		-.12*	.01	
Age*VicB*VicNB	.04	.00		-.02	.00	

Note: Gen = Gender, SES = Socioeconomic status, VicB = Victimization by bullying, VicNB = Victimization by non-bullying aggression

*** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$

Table 4*Direct victimization by bullying and non-bullying aggression in relation to evolutionary advantages*

Predictors	Attractiveness			Dating popularity			Perceived popularity			Respect		
	β	s_r^2	R^2	β	s_r^2	R^2	β	s_r^2	R^2	β	s_r^2	R^2
Step 1			.02			.01			.02			.03
Age	.01	.00		-.02	.00		-.02	.00		.01	.00	
Gen	.11*	.01		-.05	.00		-.09*	.01		.16***	.03	
SES	.08	.01		.06	.00		.12**	.01		.05	.00	
Step 2			.06			.02			.19			.07
VicB	-.13**	.01		-.05	.00		-.17***	.02		-.23***	.04	
VicNB	.23***	.04		.13**	.01		.46***	.16		.15***	.02	
Step 3			.07			.04			.22			.10
Gen*VicB	.09	.00		.15*	.01		.09	.00		.02	.00	
Gen*VicNB	-.01	.00		.01	.00		-.05	.00		.00	.00	
Age*VicB	.07	.00		.07	.00		.12**	.01		.16***	.02	
Age*VicNB	-.06	.00		.00	.00		-.09*	.01		-.01	.00	
VicB*VicNB	.03	.00		.17**	.02		-.13*	.01		-.10	.01	
Step 4			.07			.05			.22			.11
Gen*VicB*VicNB	.04	.00		.01	.00		.08	.01		.06	.00	
Age*VicB*VicNB	-.08	.00		-.15**	.01		-.07	.00		-.05	.00	

Note: Gen = Gender, SES = Socioeconomic status, VicB = Victimization by bullying, VicNB = Victimization by non-bullying aggression

*** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$

popularity (1%), and respect (2%). In contrast, direct victimization by bullying was negatively associated with three indicators of evolutionary advantages. Specifically, when controlling for age, gender, SES, and direct victimization by non-bullying aggression, direct victimization by bullying was negatively associated with attractiveness, perceived popularity, and respect. Direct victimization by bullying explained more variance in respect (4%) than attractiveness (1%) and perceived popularity (2%).

Furthermore, three significant two-way interactions were revealed. As displayed in Figure 2, age moderated the relation between direct victimization by bullying and perceived popularity, $t(586) = 2.92, p = .004$. Direct victimization by bullying had a significant negative relation with perceived popularity for younger participants ($\beta = -.33, s_r^2 = .02, p < .001$). This relation was not significant for older participants ($\beta = -.07, s_r^2 = .00, p = .325$). As displayed in Figure 3, age also moderated the relation between direct victimization by bullying and respect, $t(586) = 3.65, p < .001$. Direct victimization by bullying had a significant negative relation with respect for younger participants ($\beta = -.38, s_r^2 = .03, p < .001$). This relation was not significant for older participants ($\beta = -.04, s_r^2 = .00, p = .592$).

As displayed in Figure 4, direct victimization by non-bullying aggression moderated the relation between direct victimization by bullying and dating popularity, $t(568) = 2.92, p = .004$. Direct victimization by bullying had a significant negative relation with dating popularity for participants who experienced low levels of direct victimization by non-bullying aggression ($\beta = -.30, s_r^2 = .02, p = .001$). The negative relation between direct victimization by bullying and dating popularity was only marginally significant for participants who experienced high levels of direct victimization by non-bullying

Figure 2

Relation between direct victimization by bullying and perceived popularity moderated by age

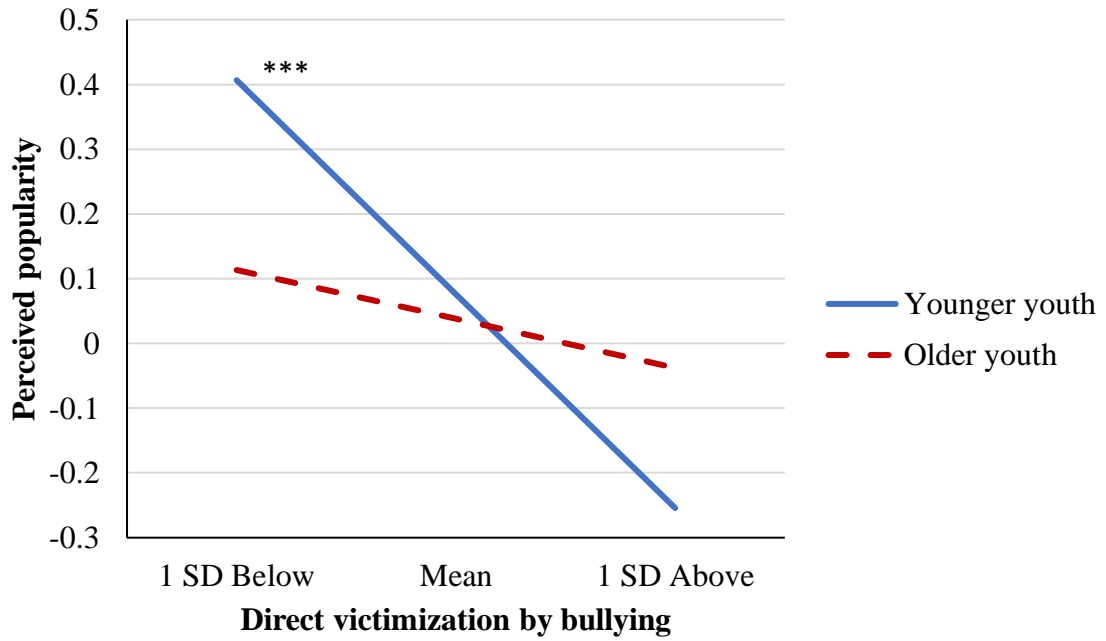


Figure 3

Relation between direct victimization by bullying and respect moderated by age

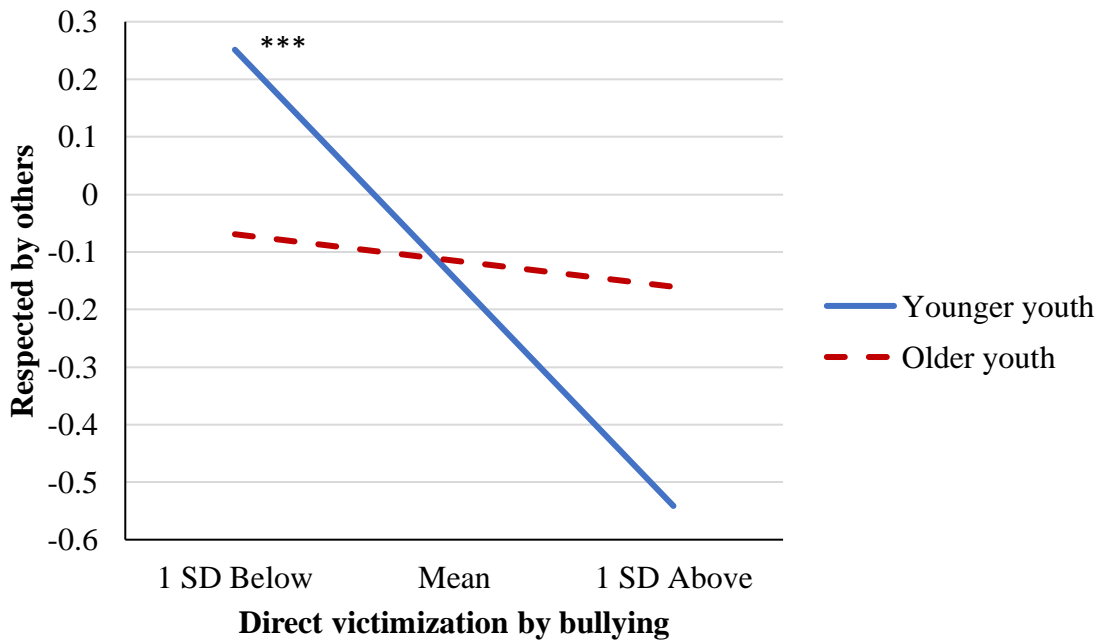
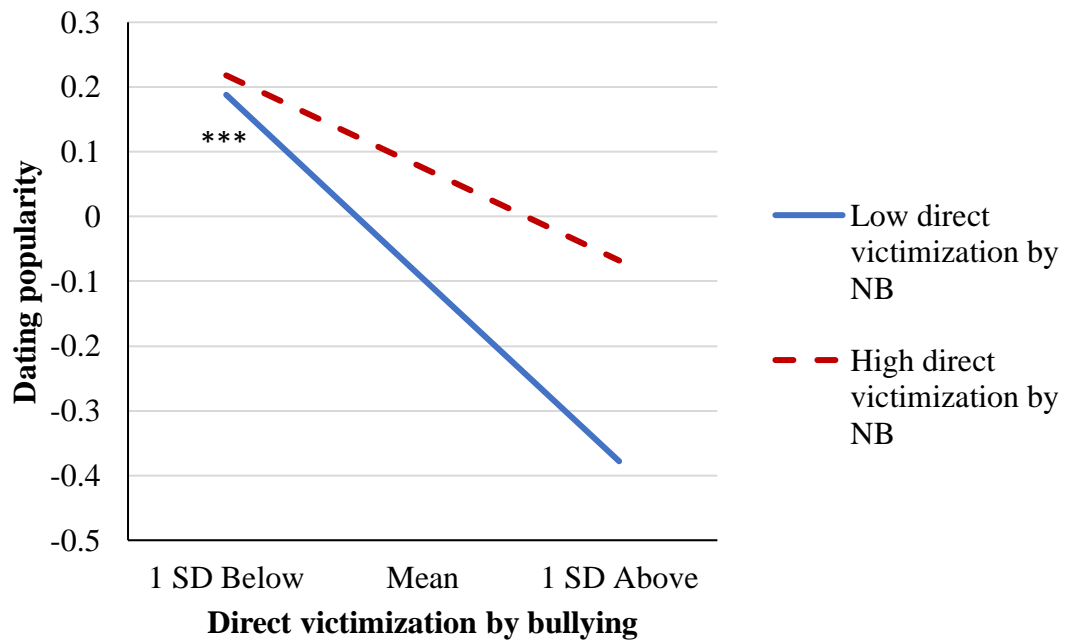


Figure 4

Relation between direct victimization by bullying and dating popularity moderated by direct victimization by non-bullying aggression



aggression, ($\beta = -.15$, $s_r^2 = .01$, $p = .022$). The results indicate that this two-way interaction was further moderated by age to reveal a significant three-way interaction, $t(568) = -2.79$, $p = .005$. As shown in Figure 5, for younger participants, there was a significant negative relation between direct victimization by bullying and dating popularity at low levels of victimization by non-bullying aggression ($\beta = -.51$, $s_r^2 = .03$, $p < .001$). This relation was only marginally significant for younger participants with high levels of victimization by non-bullying aggression ($\beta = -.23$, $s_r^2 = .01$, $p = .014$). Victimization by bullying was not significantly related to dating popularity for older participants at either low ($\beta = -.08$, $s_r^2 = .00$, $p = .453$) or high ($\beta = -.12$, $s_r^2 = .00$, $p = .109$) levels of direct victimization by non-bullying aggression.

Indirect Forms of Victimization by Bullying and Non-bullying Aggression

Psychosocial Vulnerability

Regression analyses were conducted to examine the relation between psychosocial vulnerability and indirect forms of victimization. Similar to direct forms of victimization, indirect victimization by bullying and non-bullying aggression were not significantly associated with close friendship or emotional problems. The results of these two regression analyses are presented in Table 5. Analyses did not reveal any two-way or three-ways interactions with age or gender.

Evolutionary Advantages

As presented in Table 6, the results indicated that indirect victimization by non-bullying aggression was significantly related to attractiveness and perceived popularity, and not significantly related to dating popularity and respect. Specifically, controlling for age, gender, SES, and indirect victimization by bullying, indirect victimization by

Figure 5

Relation between direct victimization by bullying and dating popularity moderated by direct victimization by non-bullying aggression and age

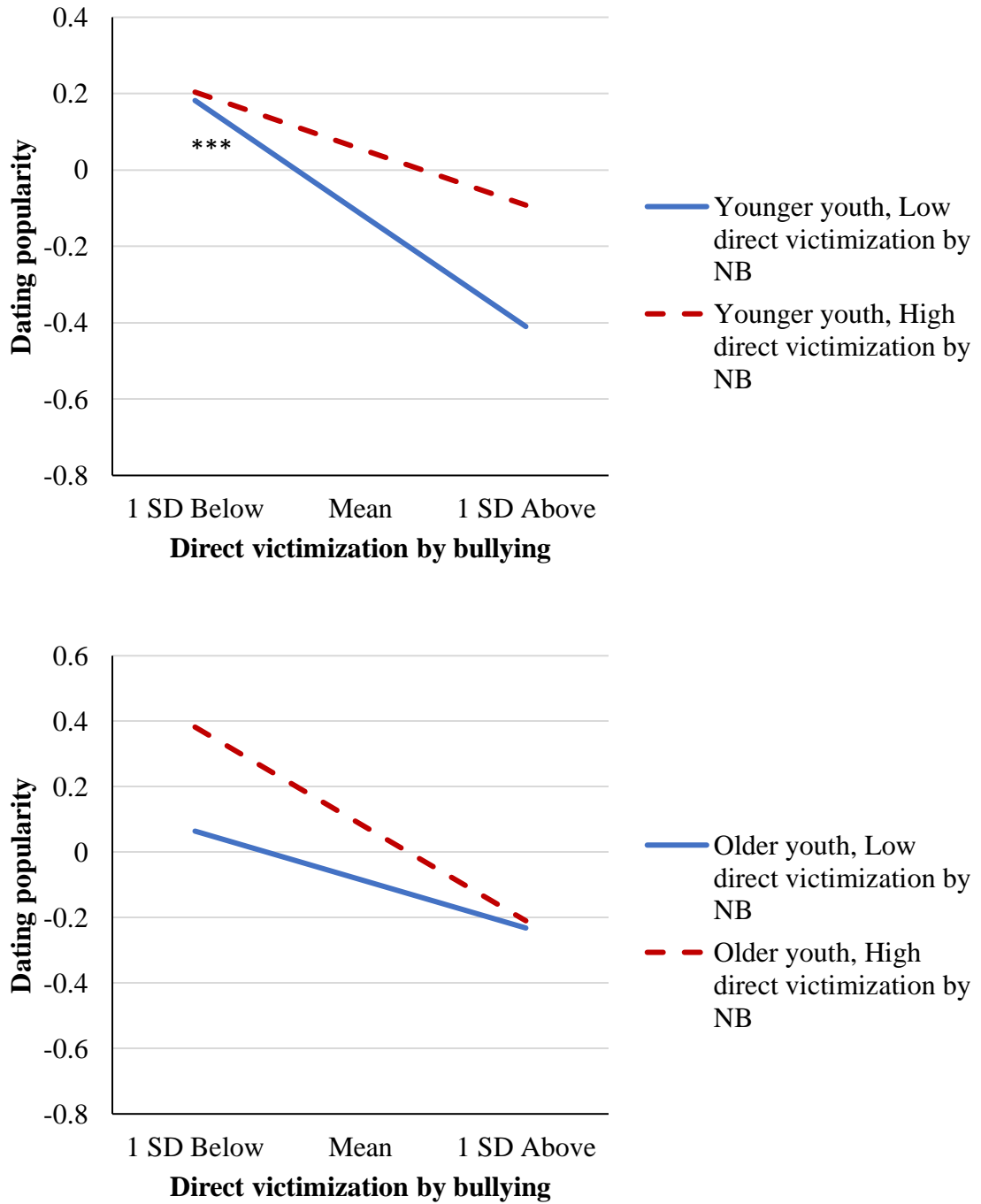


Table 5*Indirect victimization by bullying and non-bullying aggression in relation to psychosocial vulnerability*

Predictors	β	Mutual best friends		β	Emotional problems	
		s_r^2	R^2		s_r^2	R^2
Step 1			.05			.11
Age	.03	.00		.10*	.01	
Gender	.20***	.04		.29***	.08	
SES	.10*	.01		-.12**	.02	
Step 2			.05			.11
VicB	-.08	.01		-.02	.00	
VicNB	.00	.00		.00	.00	
Step 3			.06			.11
Gen*VicB	-.07	.00		.03	.00	
Gen*VicNB	-.01	.00		.04	.00	
Age*VicB	.06	.00		.02	.00	
Age*VicNB	-.04	.00		-.06	.00	
VicB*VicNB	-.08	.00		.00	.00	
Step 4			.06			.11
Gen*VicB*VicNB	-.02	.00		.00	.00	
Age*VicB*VicNB	.02	.00		.04	.00	

Note: Gen = Gender, SES = Socioeconomic status, VicB = Victimization by bullying, VicNB = Victimization by non-bullying aggression

*** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$

Table 6*Indirect victimization by bullying and non-bullying aggression in relation to evolutionary advantages*

Predictors	Attractiveness			Dating popularity			Perceived popularity			Respect		
	β	s_r^2	R^2	β	s_r^2	R^2	β	s_r^2	R^2	β	s_r^2	R^2
Step 1			.02			.01			.02			.03
Age	.01	.00		-.03	.00		-.02	.00		.01	.00	
Gender	.11**	.01		-.05	.00		-.07	.01		.16***	.03	
SES	.07	.01		.07	.00		.11**	.01		.06	.00	
Step 2			.03			.02			.08			.04
Vic by B	-.01	.00		.01	.00		.02	.00		-.12**	.01	
Vic by NB	.14**	.02		.09*	.01		.25***	.05		.04	.00	
Step 3			.06			.03			.10			.07
Gen*VicB	-.08	.00		.05	.00		-.08	.00		-.02	.00	
Gen*VicNB	.00	.00		.01	.00		.01	.00		-.04	.00	
Age*VicB	.17***	.02		.11*	.01		.12**	.01		.16***	.02	
Age*VicNB	-.06	.00		-.03	.00		.01	.00		.04	.00	
VicB*VicNB	-.01	.00		.08	.00		-.04	.00		.03	.00	
Step 4			.06			.05			.13			.07
Gen*VicB*VicNB	-.05	.00		-.16**	.01		-.18**	.01		.02	.00	
Age*VicB*VicNB	-.01	.00		-.08	.00		.12*	.01		-.03	.00	

Note: Gen = Gender, SES = Socioeconomic status, VicB = Victimization by bullying, VicNB = Victimization by non-bullying aggression

*** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$

non-bullying aggression was positively associated with attractiveness and perceived popularity. Indirect victimization by non-bullying aggression explained more variance in perceived popularity (5%) than attractiveness (2%). Indirect victimization by bullying was significantly related to respect, but not significantly related to physical attractiveness, dating popularity, and perceived popularity. Specifically, controlling for age, gender, SES, and indirect victimization by non-bullying aggression, indirect victimization by bullying was negatively associated with respect, accounting for 1% of the variance.

Furthermore, analyses revealed three significant two-way interactions. Firstly, a significant two-way interaction was found for age by indirect victimization from bullying in relation to attractiveness, $t(557) = 3.50, p = .001$. For older participants, victimization by bullying had a marginally significant positive relation with attractiveness ($\beta = .19, s_r^2 = .01, p = .017$). This relation was negative but non-significant for younger participants ($\beta = -.15, s_r^2 = .00, p = .120$). Secondly, Figure 6 displays a significant two-way interaction for age by indirect victimization from bullying in relation to respect, $t(557) = 2.94, p = .003$. For younger participants, victimization by bullying had a significant negative relation with respect ($\beta = -.27, s_r^2 = .01, p = .004$), but this relation was non-significant for older participants ($\beta = .04, s_r^2 = .00, p = .593$). As displayed in Figure 7, age also moderated the relation between indirect victimization by bullying and perceived popularity, $t(575) = 2.58, p = .010$. For older participants, indirect victimization by bullying had a significantly positive relation with perceived popularity ($\beta = .20, s_r^2 = .01, p = .010$), but this relation was not significant for younger participants ($\beta = -.04, s_r^2 = .00, p = .689$).

Figure 6

Relation between indirect victimization by bullying and respect moderated by age

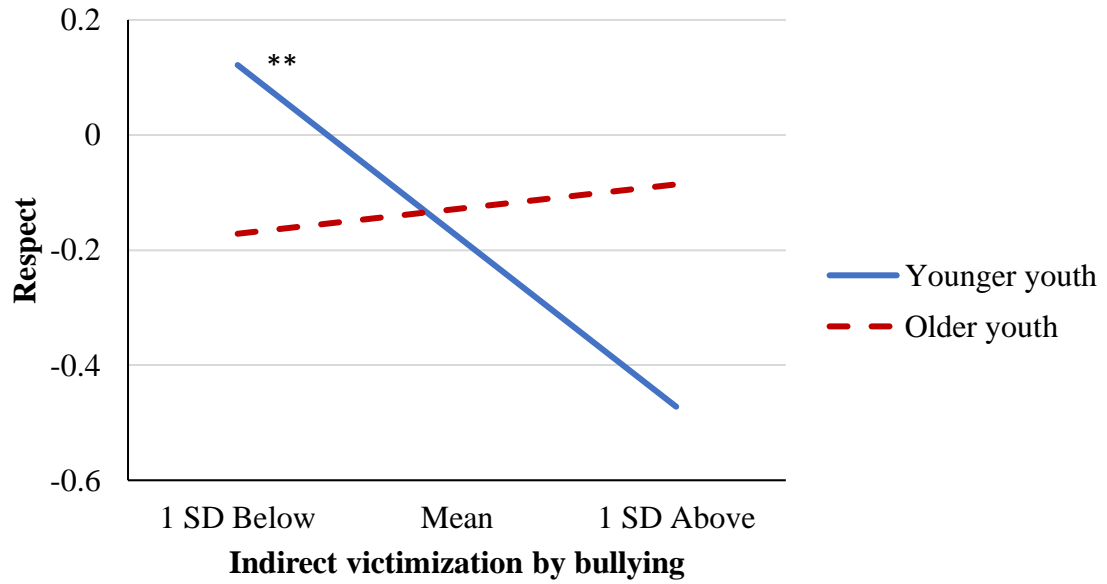
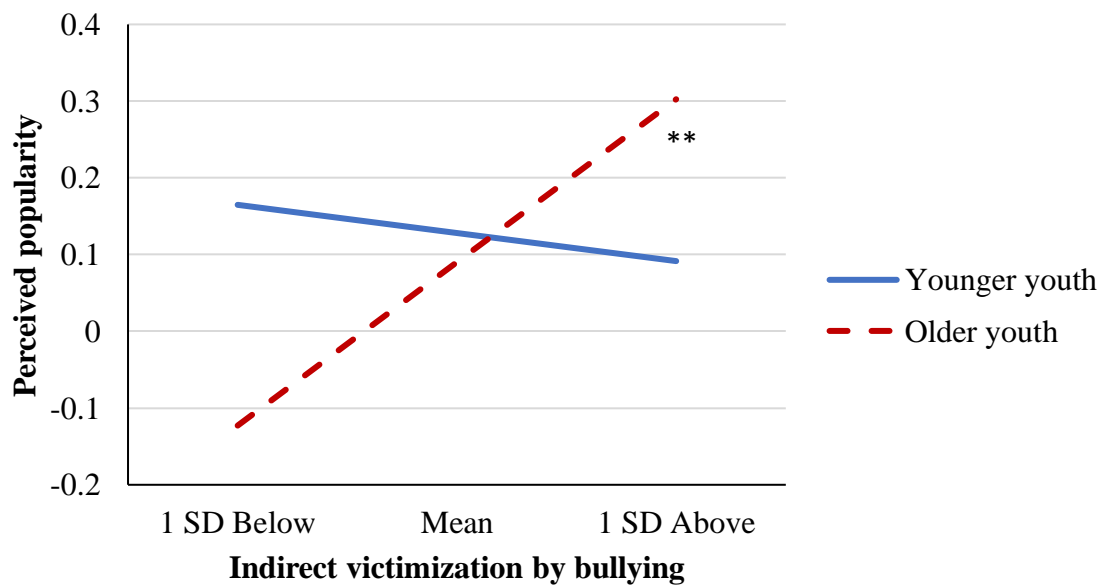


Figure 7

Relation between indirect victimization by bullying and perceived popularity moderated by age



The results also indicated two significant three-way interactions when examining the relation between indirect victimization and evolutionary advantages. Firstly, there was a significant three-way interaction with gender and indirect victimization by non-bullying aggression moderating the relation between indirect victimization by bullying and dating popularity, $t(557) = -2.70, p = .007$. For male participants, indirect victimization by bullying had a marginally significant negative relation with dating popularity at low levels of indirect victimization by non-bullying aggression ($\beta = -.23, s_r^2 = .01, p = .019$), but was not related to dating popularity at high levels of indirect victimization by non-bullying aggression ($\beta = .03, s_r^2 = .00, p = .655$). This relation was non-significant for females at low ($\beta = .07, s_r^2 = .00, p = .419$) and high ($\beta = -.05, s_r^2 = .00, p = .520$) levels of indirect victimization by non-bullying aggression.

Secondly, there was a significant three-way interaction for gender by indirect victimization from bullying by indirect victimization from non-bullying aggression in relation to perceived popularity, $t(575) = -3.04, p = .002$. Further analyses indicated that none of the conditional effects were significant. Specifically, for male participants, the relation between indirect victimization by bullying and perceived popularity was non-significant at low ($\beta = -.03, s_r^2 = .00, p = .767$) and high ($\beta = .11, s_r^2 = .00, p = .122$) levels of indirect victimization by non-bullying aggression. This relation was non-significant at low ($\beta = .14, s_r^2 = .00, p = .086$) and high ($\beta = -.12, s_r^2 = .00, p = .095$) levels of indirect victimization by non-bullying aggression for females as well. Although the conditional effects were non-significant, the valence of the association between indirect victimization by bullying and perceived popularity differed depending on sex and level of indirect non-bullying victimization

Discussion

My thesis utilized an evolutionary psychological perspective to investigating whether the risk factors for victimization differed depending on the power relation between the perpetrator and victim. The results were largely consistent with my hypotheses, suggesting that victimization by bullying and victimization by non-bullying aggression were associated with different risk factors. Specifically, my findings predominantly suggest that victims of bullying are targeted due to their vulnerability of lacking evolutionary advantages, whereas victims of non-bullying aggression are targeted due to competition and rivalry for possessing evolutionary advantages. Both types of victimization were not related to indicators of psychosocial vulnerability.

Evolutionary Advantages

Bullying is considered to be a strategy used to gain benefits such as dominance and social status in adolescence (Pellegrini & Long, 2002; Volk et al., 2014). By selecting vulnerable and rejected targets, bullies can obtain dominance, deter future aggression, and attract mates without losing social approval and affection from their peers (Pellegrini & Bartini, 2001; Veenstra et al., 2010). I predicted that peer nominations for evolutionary advantages related to reproduction and reputation would negatively associate with victimization by bullying and positively associate with victimization by non-bullying aggression. The results largely supported this prediction. Victimization by bullying, in which the victim has less power than their perpetrator, was negatively associated with peer nominations of physical attractiveness, perceived popularity, and respect. Also, victimization by non-bullying aggression, in which the victim has equal or

greater power than their perpetrator, was positively associated with peer nominations of physical attractiveness, dating popularity, perceived popularity, and respect.

Characteristics such as physical attractiveness and perceived popularity are highly valued by adolescents, and therefore individuals lacking these characteristics may not be respected or admired by their peers (Vaillancourt & Hymel, 2006). Peer-valued characteristics have been found to moderate the relation between peer rejection and peer victimization, such that rejected children who also lacked peer-valued characteristics were at greater risk of being victimized by their peers (Knack et al., 2012). The findings of my thesis suggest that adolescents who lack evolutionary advantages may be more vulnerable to victimization by bullying because they are not protected by the esteem of their peers. Bullies are more likely to target these individuals to obtain dominance and deter aggression while minimizing the cost of losing their peers' affections (Veenstra et al., 2007, 2010). Furthermore, lacking peer-valued characteristics (such as physical attractiveness and perceived popularity) provides content that bullies can use to tease their victims with witty remarks and other demonstrations of dominance.

The correlates of victimization by non-bullying aggression have not been extensively studied, especially in comparison to victimization by bullying. However, the literature examining general peer victimization reveals competition and rivalry as a potential motivation for engaging in peer aggression (Cillessen & Mayeux, 2004; Leenaars et al., 2008; Prinstein & Cillessen, 2003; Vaillancourt, 2013). Adolescents who possess high social status or have greater access and ability to attract dating partners are likely to be victimized by their peers (Gallup et al., 2009; Lapierre & Dane, 2020; Leenaars et al., 2008; Prinstein & Cillessen, 2003). I theorized that adolescents may

perceive these peers as rivals and engage in aggression as a strategy to inflict costs upon their rival while competing for status and mates. As predicted, victimization by non-bullying aggression was positively associated with evolutionary advantages, specifically physical attractiveness, dating popularity, perceived popularity, and respect. The current study demonstrates that lacking or possessing evolutionary advantages can put adolescents at risk for victimization, but the direction of this relation depends on the power relation between the perpetrator and victim. Individuals who lack evolutionary advantages tend to be targeted by those of greater power and individuals who possess evolutionary advantages tend to be targeted by those of equal or less power.

Physical attractiveness is evolutionarily advantageous because it indicates high mate value, increases one's ability to attract mates, and in turn, correlates to high reproductive success (Buss, 1989). Physical attractiveness is also highly valued by adolescents (Knack et al., 2012; Vaillancourt & Hymel, 2006). Low levels of self-perceived and peer nominated physical attractiveness have been associated with general peer victimization and bullying victimization (Knack et al., 2012; LaFontana & Cillessen, 2002; Leenaars et al., 2008; Rosen et al., 2011). A lack of physical attractiveness is a salient and visible characteristic making it an easy characteristic for adolescents to tease others about. However, high levels of physical attractiveness have also been associated with general peer victimization when competing for mates in intrasexual competition, especially for females (Leenaars et al., 2008; Vaillancourt & Sharma, 2011). The current study has replicated both these findings and extended the literature to demonstrate that an adolescent's level of physical attractiveness correlates to victimization by individuals of different power relations to the victim. Both male and female adolescents who received

fewer nominations of physical attractiveness were more likely to be targeted by those of greater power, and adolescents who received more nominations for physical attractiveness were more likely to be targeted by those of equal or less power.

Dating popularity indicates how desirable of a dating partner an individual is perceived to be by their peers. Previous literature has established the link between peer victimization and dating and sexual behaviour, such as the number of dating or sexual partners and age of first sexual experience (Dane et al., 2017; Gallup et al., 2009; White et al., 2010). The current study extends this research by demonstrating that an individual's peer-nominated desirability as a dating partner is also linked to peer victimization. Specifically, those who were nominated for being a highly desirable dating partner were more likely to be victimized by non-bullying aggression. This finding adds to the literature by corroborating the use of aggression in adolescent intrasexual competition. Also, victimization by bullying was negatively associated with dating popularity for younger youth who experience low levels of non-bullying aggression. This finding suggests that for early adolescents who may not be seen as a rival in intrasexual competition and have low dating popularity are being targeted by bullies due to their vulnerability in the peer group.

Previous research examining the use of aggression in intrasexual competition has found inconsistent results for male and female participants. For example, females who reported a greater number of past dating and sexual partners, an earlier age of first sexual experience, and higher levels of physical attractiveness were at greater risk of being victimized by their peers (Dane et al., 2017; Gallup et al., 2009; Lapierre & Dane, 2020; Leenaars et al., 2008). These findings have not been consistently demonstrated for males.

Based on this literature, I predicted that the positive relation between non-bullying victimization and reproductively relevant evolutionary advantages (physical attractiveness and dating popularity) would only be significant for females and not for males. The results did not support this prediction. Instead, both males and females who were nominated for being physically attractive or highly desirable as a dating partner were at risk for victimization by non-bullying aggression. When examining predictors of victimization in intrasexual competition, previous studies did not measure the power relation between the perpetrator and victim, which may explain the inconsistent findings between males and females (Gallup et al., 2009; Leenaars et al., 2008; White et al., 2010). My thesis demonstrates the importance of measuring the power relation in peer victimization when examining intrasexual competition. Regardless of gender, those who receive more nominations for physical attractiveness and dating popularity are at risk for victimization by those of equal or lesser power than themselves. In contrast, those who receive fewer nominations for physical attractiveness are at risk for victimization by those of greater power.

In addition to risk factors related to reproduction, the current study also found varying levels of reputation-related risk factors to be associated with both types of victimization. Victimization by non-bullying aggression was positively related to perceived popularity. This is consistent with previous literature demonstrating that individuals who are perceived by their peers as being popular are sometimes targeted by peer aggression due to competition and rivalry (Closson et al., 2017; Prinstein & Cillessen, 2003). Additionally, previous literature has found victimization by bullying to be negatively related with perceived popularity (de Bruyn et al., 2010; Sentse et al.,

2015), which was replicated in the current study for direct forms of victimization in younger participants. However, indirect victimization by bullying was positively associated with perceived popularity for older participants. The power relation between the perpetrator and victim, based on strength and popularity, is an inherent property of victimization by bullying and non-bullying aggression. This power balance between the perpetrator and victim is based on relative power, not the individual's absolute power. This follows that although bullying refers to aggression perpetrated by someone of greater power than their victim, this does not preclude popular individuals from being bullied, which is demonstrated in this study. Popular adolescents may bully other popular peers of slightly lower status than themselves as a way to deter aggression and maintain their position in the hierarchy. Research has demonstrated that popular adolescents who are able to maintain their popularity over time exhibit the greatest levels of proactive aggression, which suggests that these individuals may possess the social competence and emotion regulation to utilize aggressive tactics to meet their goals (Crick & Dodge, 1996; van den Berg et al., 2019). Furthermore, indirect forms of aggression, such as manipulating social relationships, social exclusion, and derogation of reputation, have been found to be especially useful when targeting high status individuals (Prinstein & Cillessen, 2003).

This also highlights the advantage of using peer nomination questions that directly ask participants to identify peers in their grade whom they have victimized. By directly asking one of the individuals in the perpetrator-victim dyad instead of all individuals in the social network, I can better assess the participant's perception of the power relation between the two individuals.

In addition to perceived popularity, I also measured peer nominations of respect and admiration to assess reputation. Being respected and admired by peers is considered to be an indicator of one's social attention holding power, which refers to one's ability to accumulate favourable attention towards themselves (Gilbert et al., 1995). The ability to hold social attention is an important resource as it is highly useful to pursue favourable social interactions, form alliances, and attract mates. Individuals who are admired and respected by their peers possess high prestige in their peer group (Henrich & Gil-White, 2001). Prestige and dominance both refer to social standing in the hierarchy but differ in how each is acquired. Dominance is obtained forcefully through coercion and fear, whereas prestige is freely conferred deference by peers (Henrich & Gil-White, 2001). Prestigious individuals have earned the affection and esteem of their peers and have a high degree of influence in their peer group.

Consistent with my predictions, adolescents who received fewer nominations for respect and admiration were more likely to be victimized by those of greater power, and those who received more nominations were more likely to be victimized by those of equal or less power. The findings of the current study align with previous research by Andrews and colleagues (2016), which demonstrated a curvilinear relation between prestige and physical and relational victimization in early adolescent social networks. Specifically, females who possessed high prestige in their social network were likely to be victimized by their peers. Both male adolescents who possessed low or high social network prestige were at risk of victimization (Andrews et al., 2016). Furthermore, targeting victims with high social network prestige increased the aggressor's own social network prestige, which demonstrates the effectiveness of using aggression to ascend the

social hierarchy (Andrews et al., 2017). Although the findings of the current study align with this research, there are methodological differences in measuring prestige. Andrews and colleagues (2016; 2017) conceptualized and measured social network prestige as the number of friendship nominations an individual received, as well as their proximity to other peers in the social network. The measure used in my thesis aligns more closely with the concept of prestige described by Henrich and Gil-White (2001), as it specifically measured participants' level of admiration and respect received from their peers rather than inferred freely conferred deference from friendship nominations.

Aggressing against peers of equal or greater power can be risky, and indirect forms of aggression allow for anonymity, which may reduce this risk. Consistent with this notion, previous research has found that indirect forms of aggression were more likely used against those of high social status or with characteristics indicating high mate value (Closson et al., 2017; Prinstein & Cillessen, 2003; Vaillancourt, 2013; Vaillancourt & Sharma, 2011). The results did not support my prediction that indirect forms of victimization would more likely be used than direct forms when aggressing against those of equal or greater power. Indirect victimization by non-bullying aggression was positively associated with physical attractiveness and perceived popularity, however, direct forms of non-bullying victimization were positively associated with all four evolutionary advantages examined. Moreover, for physical attractiveness and perceived popularity, direct forms of non-bullying aggression explained more variance than indirect forms.

Indirect forms of victimization include relational and cyber forms of aggression which tend to increase in prevalence during early adolescence when friendships and

social networks become more intimate and complex (Björkqvist et al., 1992; Cleverley et al., 2012). My thesis examined youth between the ages of 9 to 14, when direct forms of aggression may still be more prevalent than indirect forms for the younger participants. Previous studies examining the use of indirect aggression in intrasexual competition and competition for status was conducted on samples of either high school or undergraduate students (Leenaars et al., 2008; Prinstein & Cillessen, 2003; Vaillancourt & Sharma, 2011). Future research should examine differences in direct and indirect forms of victimization in relation to evolutionary advantages in a sample of older adolescents. The likelihood to use indirect forms of victimization in competition and rivalry against those of equal or greater power than the aggressor may increase in this age group.

Psychosocial Vulnerability

I predicted that victimization by bullying would be positively associated with psychosocial vulnerability, characterized by fewer close friendships and greater emotional problems. The data did not support this prediction. Number of close friendships and emotional problems were not associated with victimization by bullying. The friendship protection hypothesis refers to the protective function that close friendships can have on peer victimization (Boulton et al., 1999). Close friendships help minimize psychosocial maladjustment, such as internalizing problems, which then lowers the risk of victimization in childhood and adolescence (Hodges et al., 1997). Secondly, close friends are more likely than other peers to defend their friend from bullies (Forsberg et al., 2014; Spadafora et al., 2020). Previous research has demonstrated this negative association between the number of reciprocated friendships and peer victimization (Cardoos & Hinshaw, 2011; Hodges et al., 1999; Malcolm et al., 2006; Scholte et al.,

2009), but this link was not replicated in the current study. The current study examined the number of reciprocal close friendships, but perhaps examining the nature of these close friendships might reveal more about its relation to victimization by bullying. In a study conducted by Scholte and colleagues (2009), victims had fewer reciprocal friendships than their uninvolved peers and these close friends were found to be socially less well adjusted. It is possible that victimization by bullying was not associated with close friendship because these friends were not able to provide support to decrease the victim's risk factor.

For my thesis, I hypothesized that bullies would be more likely to choose victims with fewer close friendships because there was a lower likelihood of friends defending and retaliating on the behalf of their friend. However, the victim's friends may not be in the position to provide this social and physical protection for their victimized friend. Hodges and colleagues (1997) demonstrate that the behavioural qualities of the victim's close friend play a role in the protective function of close friendship on peer victimization. The protective function of close friendships was less effective when the victim's friends lacked the physical ability to defend, were also victimized, and had externalizing problems (Hodges et al., 1997). Furthermore, friends with externalizing problems were more likely to jump in to defend their friend from victimization. In contrast, friends with internalizing problems may be less likely to intervene and defend their friend (Malone & Perry, 1995, as cited in Hodges et al., 1997).

Emotional problems have been linked to peer victimization as both an antecedent and consequence (Dhami et al., 2005; Hodges et al., 1999; Hodges & Perry, 1999; Malti et al., 2010). Emotional problems are an aspect of internalizing problems, which also has

been shown to predict victimization (Reijntjes et al., 2010). The current study assessed emotional problems with a the 5-item subscale using a Strengths and Difficulties Questionnaire (Goodman, 1997). More comprehensive measures of emotional difficulties which assess anxiety and depression separately or assess different facets of anxiety may yield different findings in its relation to bullying victimization. Furthermore, it is possible that the relation between emotional problems and bullying victimization was mitigated by moderator variables not measured in this study. Research has shown that the emotional distress associated with bullying victimization was buffered by maternal or peer social support and a greater presence of other vulnerable peers (characterized as overweight, had a disability, or identified as lesbian, gay, bisexual, or questioning; LGBTQ) in the school (Eisenberg et al., 2016; Holt & Espelage, 2007).

Implications

The findings of my thesis demonstrate the importance of measuring the power relation between the perpetrator and victim when assessing the risk factors associated with peer victimization, as the risk factors associated with victimization by bullying and non-bullying aggression differ. Research examining general peer victimization, where the power balance was not measured, has found a wide range of correlates which often conflict with each other. For example, general peer victimization has been associated with both high and low levels of social status, prestige, dating and sexual outcomes, and physical attractiveness (Andrews et al., 2016; Gallup et al., 2009; Leenaars et al., 2008; Prinstein & Cillessen, 2003). In these studies, victimization was assessed by asking participants to self-report how they have been victimized or by asking participants to identify victims in their social network without regard to the power relation. The current

study focused on measuring the power relation between the perpetrator and victim by specifically asking participants to identify peers in their grade whom they have victimized and whether these individuals had less power than themselves (bullying victimization) or equal or greater power than themselves (non-bullying victimization). By asking an individual within the perpetrator-victim dyad, we are better able to understand the true nature of the power relation between the two.

By measuring peer victimization of different power relations, my thesis demonstrated that victimization by bullying was generally associated with fewer evolutionary advantages, specifically physical attractiveness, perceived popularity, and respect by others. In contrast, victimization by non-bullying aggression was associated with greater evolutionary advantages, specifically physical attractiveness, dating popularity, perceived popularity, and respect by others. This study has demonstrated different characterizations for both types of victims which may reveal different motivations for both types of victimizations. Future research should directly assess motivations of bullying and non-bullying aggression by asking the perpetrators their reasons for targeting victims. This knowledge can be applied to interventions which address risk factors of victimization and aid in decreasing the negative consequences associated with victimization.

Secondly, the findings of my thesis demonstrate that both males and females are victimized by non-bullying aggression for possessing characteristics indicating high mate value. Previously, studies of peer victimization in intrasexual competition involving males have demonstrated inconsistent findings and the current study suggests that this inconsistency may be attributable to not measuring the power relation in the perpetrator-

victim dyad. For both males and females, those who lacked reproductively relevant evolutionary advantages were victimized by those of greater power and those who possessed reproductive-relevant evolutionary advantages were victimized by those of equal or less power.

Limitations and Future Directions

As with many studies, my thesis has limitations that need to be addressed in future research. Firstly, I used a cross-sectional research design, and therefore, the directional nature of the effects cannot be determined. Longitudinal research needs to be conducted to ascertain whether the possessing or lacking evolutionary advantages is an antecedent or consequence of peer victimization.

Secondly, I did not control for aggression when examining the correlates of both types of victimization. The focus of my thesis was to examine the differences in the power balance between the perpetrator and victim, and as such, I chose to control for these differences in power balances between both types of victimization. Although controlling for aggressive behaviour, in addition to power balance, was beyond the scope of this study, future research should address the role of aggression in the correlates of bullying and non-bullying victimization. There is a possibility that individuals may aggress against those of equal or greater power than themselves in defence or retaliation against previous aggression. In other words, they may be retaliating against bullies who possess evolutionary advantages as a result of their aggressive behaviours. Person-oriented research examining aggression-victimization groups may help determine whether some experiences of bullying or non-bullying victimization involve retaliation on the part of the perpetrator.

Thirdly, the current study grouped victimization towards those of equal power to the perpetrator and victimization towards those of greater power than the perpetrator into victimization by non-bullying aggression. The purpose of my thesis was to examine how victimization by bullying differed from victimization by non-bullying aggression. I predicted that victimization against those of equal and greater power than the perpetrator would both be motivated by competition and rivalry. Therefore, conceptually, it made sense to combine the two power balances of victimization together. Also, victimization towards those of equal and greater power were grouped together to maintain the time constraints that participants had to complete the survey. However, future research could examine whether the correlates of victimization towards those of equal power to the perpetrator differs from victimization towards those of greater power than the perpetrator.

Future research should also examine the negative consequences associated with both types of victimization. Bullying has been shown to have detrimental effects to victims' psychosocial adjustment and well-being (Juvonen et al., 2000; Stapinski et al., 2015). Future research should investigate whether victims of non-bullying aggression face the same negative consequences. Some research suggests the power balance between the perpetrator and victim does influence the level of psychosocial impairment that the victim experiences (Kaufman et al., 2020; Ybarra et al., 2014). Victims who reported a power imbalance were more likely to experience emotional, relational, and social maladjustment (Kaufman et al., 2020). Furthermore, adolescents who are victimized by repeatedly by those of greater power are more likely to report conflicts in their relationships with family and friends, interference with their school work, a sense of hopelessness, and helplessness about their victimization, in comparison to adolescents

who are victimized but not repeatedly or by those of greater power (Ybarra et al., 2014).

This demonstrates that victimization may be especially detrimental or impairing when the victim has less power than their perpetrator. Additional research should be conducted to further examine these negative consequences.

Conclusions

Overall, my thesis data demonstrate that the power relation between the perpetrator and victim relates to differential risk factors for peer victimization, consistent with an evolutionary psychological perspective. Specifically, individuals who lack evolutionary advantages may not be held in high esteem by their peers which makes them vulnerable to victimization by those of greater power who seek dominance, as well as social affection from peers. Conversely, individuals who possess greater evolutionary advantages are at risk for victimization by those of equal or less power than themselves. These individuals possess characteristics which demonstrate their high position in the social hierarchy and their ability to attract and gain access to mates which mark them as rivals to their peers. My data demonstrates the importance of examining the power relation in peer victimization and suggest that future research should measure victimization similarly or at least be mindful of the limitation of measures which do not assess the power relation.

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Appendices

Appendix A Parental Consent Form

Brock University Adolescent Relationships Study: Parental Consent Form

Principal Investigator:

Dr. Anthony Volk, Professor

Department of Child and Youth Studies, Brock University

905-688-5550 xt. 5368

tvolk@brocku.ca

CONSENT FORM FOR PARENT/GUARDIAN

PLEASE CHECK ONE OF THE BOXES BELOW

I agree that my son/daughter(s) may participate in this study.

I *DO NOT* agree that my son/daughter(s) may participate in this study.

I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time and request that my son/daughter's data be removed from the study by contacting the researchers.

Son/daughter(s) Name _____

Parent Name: _____

Signature: _____ Date: _____

Please return this form regardless of whether you have provided consent or not. **A returned form allows your son/daughter to participate in a draw for prizes and earns funding for the school and classroom**, regardless of whether you give consent.

You can also give online consent at:

<https://www.surveymonkey.com/r/brockteens>

Please see details about the study below.

Your son/daughter will be invited to participate in a study that involves research into adolescent relationships. This research is funded by a research grant ranked as the top application by the federal government, and it has been designed with the input and support of the Niagara Catholic School Board to meet the needs of their students. The purpose of our study is to understand how children and adolescents can learn to use prosocial strategies, such as cooperation and leadership skills, instead of strategies like bullying, to achieve key social and personal goals.

Our previous research has shown that adolescents achieve benefits like popularity and social influence from both prosocial behaviour and coercive strategies like bullying. The current study is designed to better understand the individual and social factors that allow adolescents to see the greater benefits of being kind, cooperative and respectful with one another, rather than exploiting power to achieve short-term goals at the expense of healthy relationships. This research also supports understanding and identifying potential improvements to positive school climate.

WHAT'S INVOLVED

As a participant, your son/daughter will be asked to fill out questionnaires about themselves, their peers (e.g., friendships), school (e.g., classroom harmony), parents (e.g., levels of support), and basic demographic information (e.g., age). We use a broad range of measures because we think adolescent choices can be complicated, so we need to see the whole picture. For the same reason, we also ask the adolescents to rate their relationships with other people in their classes (e.g., Who are your best friends? Who is nice?). This peer data is incredibly valuable information as it allows us to paint a detailed picture of both individuals and the group dynamics in each classroom. Taken together, this information will help us to better understand how adolescents can be encouraged to choose cooperative and respectful behaviour over bullying, to achieve personal goals while maintaining health relationships. Participation will take approximately 60 minutes of their time as they answer questions on tablets we provide. We require a one-time consent from the parent along with assent prior to each of the two data collections from your son/daughter (who will see a similar form). We will visit each class twice this year. Though we will for ask for parental consent each year, we plan to follow up on these students for at least another 2 years after this year, by matching student names to confidential ID numbers as explained below. If consent is not granted in a given year, we will still have access to previous years' data unless you request we remove your adolescent from the study.

POTENTIAL BENEFITS AND RISKS

We do not believe that there are any risks associated with this research that are greater than any that your son/daughter would encounter in everyday experiences. If they find any part of this study to be stressful, they may contact the researcher, the Brock University Ethics board, or simply stop participating. We also tell your son/daughter that "[they] may also freely discuss the study with parents or friends if [they] need to, although we would ask that [they] try not to talk to someone before [they] complete the study on [their] own (e.g., don't share answers until both have completed the study). We do not ask any specific questions regarding specific incidents, so there are no issues of personal or legal liability for any of your son/daughter's answers. This applies to both their answers as well as any answers their classmates provide about them. Those data will be completely confidential (see below).

We are offering a prize pool for each school based on the number of completed parental consent forms. Your child will be eligible for the draw for this prize pool (including things like gift cards, tablets, etc., worth a minimum of \$500 in total) if they return a signed consent form (regardless of whether you say yes or no). We are also offering \$10 for each returned consent form to build a fund that each classroom can spend as they see fit (e.g., spend on anti-bullying speaker or an appropriate class trip). This amount increases to \$20 per returned consent form if more than 85% of the parental consent forms are received. Again, positive consent is not required for any of these benefits, as we just want to ensure that you have had the chance to read these forms and are aware of the opportunity for your son/daughter to participate in our study.

CONFIDENTIALITY

Participants in this study will be identified only by a unique ID number that is tied to a master list kept by Dr. Volk. You, or they, may request the withdrawal of their data from the study within 5 years of their participation. Nothing that they report will be shared with peers or school staff. Furthermore, we will not publish any information about the study that will identify the responses of your son or daughter, or responses of children in their classroom.

As a parent, you will have to provide your consent in order for your son/daughter to participate in the study. Your consent will allow us to use their answers in our research, but it will not entitle you to have access to their survey responses. Although we encourage you to discuss the study and the issue of bullying with your children, it is very important for the participants in our study to know that their answers are completely confidential. We have found in the past that when adolescents have complete confidentiality, the vast majority are actually extremely honest about their positive and negative choices and behaviour. We also provide contact numbers for your adolescents to talk to professionals confidentially, if they have any concerns.

Data collected during this study will be stored on a secure computer. Data will be kept for five years after the completion of the study, after which time the data will be deleted or shredded. Access to this data will be restricted to Dr. Volk and his collaborators. Parents, friends, participants, and teachers will not have access to any individual data, although they may have access to the overall study results.

VOLUNTARY PARTICIPATION

Your adolescent's participation is voluntary. They need not participate, even if you give parental consent. There are no organizational or personal consequences for not participating. If they do not return a parental consent form (positive or negative), they will not be entered into the prize draw, nor will they contribute money toward the class fundraiser. If you wish to withdraw your child from the study, or they wish to quit, simply contact the researchers. Children who do not participate will read materials about peer relationships.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available by late Spring or Early Summer on Dr. Volk's research web page (<http://www.brocku.ca/vrbaby/research.html>) and through your school.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions or concerns about this study, please contact the study coordinator, Dr. Volk, using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University #18-053. It has also been approved by the NCDSB Ethics Board, and, because we are collaborating with Dr. Wendy Craig, a national expert on bullying, by the Queen's University's Ethics Board. If you have any comments or concerns about the study ethics, or your adolescent's rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

If you have any concerns about your adolescent participating as a bully, or being a victim of bullying, please feel free to discuss the matter with other parents, teachers, friends, and/or any trusted individuals. For advice on how to talk to your adolescent or other individuals about bullying, we recommend www.bullying.org, <http://www.lfcc.on.ca/bully.htm>, and the Niagara Youth Connection (905-641-2118 ext. 5592). You may also feel free to contact me, Dr. Anthony Volk, at tvolk@brocku.ca (905-688-5550 ext. 5368) with any related questions or concerns. Thank you for your help in this project!

Please keep this form for your records.

Appendix B
Elementary School Debriefing Form

Adolescent Relationships

Principal Investigator:

Dr. Anthony Volk, Professor
Department of Child and Youth Studies
Brock University
905-688-5550 xt. 5368
tvolk@brocku.ca

You are invited to take part in a study on adolescent relationships. The purpose of this study is to learn how adolescents get along with their friends and classmates at school, and how getting along could be easier for everyone to do. By answering the questions in our study, you can help us to better understand this important part of your life at school. This research also supports understanding and identifying potential improvements to positive school climate.

WHAT'S INVOLVED

As a participant, you will be asked to answer questions about yourself, your friendships, your parents, and your school. We will ask you to answer questions about yourself and the people in your classroom (e.g., Who are your friends? Does anyone bully you?). This information is really important, and we need to get it directly from the source- you! People often try to understand adolescents, but that won't work very well unless we actually listen to the adolescents themselves! So, we really encourage you to answer honestly. As we say below, all of your answers will be confidential (i.e., secret) and there are no consequences to admitting good or bad behavior. So you can't get into any trouble no matter what you answer.

It should take you about 60 minutes to complete the questions presented on our tablets. We will do this once in the Fall and once in the Spring.

POTENTIAL BENEFITS AND RISKS

By getting involved, you may learn about ways to get along with others at school and will help us to understand this a little better too. We will only ask questions about your usual everyday experiences, things that you know a lot about. If you find any part of this study to be stressful, you may tell the researcher, the Brock University Ethics board, or simply stop answering the questions.

We will not ask you about anything that could get you or anyone else in trouble with teachers, parents, or the police. If you are concerned about specific things that have happened to you, we strongly suggest that you discuss them with your parents, teacher, or anyone you trust. You may also contact the Kids Help Phone at: <http://www.kidshelpphone.ca/en/> (1-800-668-6868). It is important to know that you do not need to stay silent and accept any form of bullying or abuse!

Your parents need to give you consent so that you can get involved in the study. If you return a signed parental consent form (whether they say yes or no), you will be entered into a draw for school prizes (e.g., gift cards, tablets, ipads, etc.). We will also give \$10 to your class for every consent form returned to your class. This goes up to \$20 if more than 85% of the class brings back their forms. You and your teacher will decide how this money is spent, but it can go towards things like free pizza lunches, class trips, and so on. So, if you return your consent form, you will have a chance to win a prize, and you will raise money for your class!

CONFIDENTIALITY (PRIVACY)

The researchers in this study will not know your name when they look at your answers, They will only know the ID number which you will be given when you get involved in the study. That way, your answers will be private. No one at the school, not even your teachers, will be able to read your answers. Your parents will have to give you permission to get involved, but they will not be able to read your answers (although they can ask that your answers be removed from the study). Your friends and classmates will not be able to read your answers. The only people who see them are the researchers, and they will only know your ID number, not your name. Only Dr. Volk will have a copy of your consent form, with your name and ID number, locked in a cabinet. We keep this information so we can match your answers from the fall with those you give in the spring. Also, if you want to remove your answers from the study later on, this information will allow us to do that. So please answer as honestly as possible! Again, there are no consequences for saying good or bad things, because your answers are private. You do not have to worry about anyone finding out your answers or asking you about your answers. Your answers will not get you in trouble with teachers, parents or anyone else.

Information collected during this study will be stored on a secure computer and hard copies will be kept in a locked filing cabinet.

VOLUNTARY PARTICIPATION

You decide if you want to be a part of this study. Whether you take part, or what questions you answer, is completely up to you. If you want to stop answering questions at any time, you may do that without any problem. Your answers to our questions will not affect your school grades or how you are marked.

However, before you can participate in this study, you MUST get permission from your parents. Your teacher will give you a consent form to give to your parents. If you do not have permission from your parents, you may NOT participate in this study. Again, your parents will not know your answers, but they do control whether WE are able to see your answers or not. Even If your parents do give you permission, you do not have to participate. That is your decision. You need their permission to participate, but that doesn't mean you have to. If you want to stop answering questions, please let the researchers in the classroom know. If you want your answers removed from the study later, just email us and we will do that for you.

PUBLICATION OF RESULTS

Results of this study may be published in scientific journals and presented at scientific meetings. Information about what was learned in this study will be available by late Spring or Early Summer on Dr. Volk's research web page (<http://www.brocku.ca/volklab>), as well as through your school.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or want more information, please contact Dr. Volk using the contact information provided above. If you have any questions while you are filling out the forms, please feel free to contact Dr. Volk. This study has been reviewed and approved by the Research Ethics Board at Brock University # 18-053. It has also been approved by the Queen's University Ethics Board and the Niagara Catholic School Board's Ethics Board. If you experience any stress while participating in this study, please refer to the debriefing form for a list of agencies you may contact.

If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your help in this project!

Please keep this form for your records.

Appendix C

Secondary School Debriefing Form

Adolescent Relationships

Principal Investigator:
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905-688-5550 xt. 5368
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You are invited to take part in a study on adolescent relationships. The purpose of this study is to learn how adolescents get along with their friends and classmates at school, and how getting along could be easier for everyone to do. By answering the questions in our study, you can help us to better understand this important part of your life at school. This research also supports understanding and identifying potential improvements to positive school climate.

WHAT'S INVOLVED

As a participant, you will be asked to answer questions about yourself, your friendships, your parents, and your school. We will ask you to answer questions about yourself and the people in your classroom (e.g., Who are your friends? Does anyone bully you?). This information is really important, and we need to get it directly from the source- you! People often try to understand adolescents, but that won't work very well unless we actually listen to the adolescents themselves! So, we really encourage you to answer honestly. As we say below, all of your answers will be confidential (i.e., secret) and there are no consequences to admitting good or bad behavior. So you can't get into any trouble no matter what you answer.

It should take you about 60 minutes to complete the questions presented on our tablets. We will do this once in the Fall and once in the Spring.

POTENTIAL BENEFITS AND RISKS

By getting involved, you may learn about ways to get along with others at school, and will help us to understand this a little better too. We will only ask questions about your usual everyday experiences, things that you know a lot about. If you find any part of this study to be stressful, you may tell the researcher, the Brock University Ethics board, or simply stop answering the questions.

We will not ask you about anything that could get you or anyone else in trouble with teachers, parents, or the police. If you are concerned about specific things that have happened to you, we strongly suggest that you discuss them with your parents, teacher, or anyone you trust. You may also contact the Kids Help Phone at: <http://www.kidshelpphone.ca/en/> (1-800-668-6868). It is important to know that you do not need to stay silent and accept any form of bullying or abuse!

If your parents return the form declining participation, you may not be involved in the study. If you participate, you will be entered in a draw to win one of several \$100 individual gift cards (of your choice). Your participation will also raise money that will be spent on resources and services that support student learning (the specifics will depend on your school's choices).

CONFIDENTIALITY (PRIVACY)

The researchers in this study will not know your name when they look at your answer. They will only know the ID number which you will be given when you get involved in the study. That way, your answers will be

private. No one at the school, not even your teachers, will be able to read your answers. Your parents will not be able to read your answers. Your friends and classmates will not be able to read your answers. The only people who see them are the researchers, and they will only know your ID number, not your name. Only Dr. Volk will have a copy of your consent form, with your name and ID number, locked in a cabinet. We keep this information so we can match your answers from the fall with those you give in the spring. Also, if you want to remove your answers from the study later on, this information will allow us to do that. So please answer as honestly as possible! Again, there are no consequences for saying good or bad things, because your answers are private. You do not have to worry about anyone finding out your answers or asking you about your answers. Your answers will not get you in trouble with teachers, parents or anyone else.

Information collected during this study will be stored on a secure computer and hard copies will be kept in a locked filing cabinet.

VOLUNTARY PARTICIPATION

You decide if you want to be a part of this study. Whether you take part, or what questions you answer, is completely up to you. If you want to stop answering questions at any time, you may do that without any problem. Your answers to our questions will not affect your school grades or how you are marked.

If your parents return the form declining participation, you may not be involved in the study. Again, your parents will not know your answers, but they do control whether we are able to see your answers or not. Even if your parents do give you permission, you do not have to participate. That is your decision. You need their permission to participate, but that doesn't mean you have to. If you want to stop answering questions, please let the researchers in the classroom know. If you want your answers removed from the study later, just email us and we will do that for you.

PUBLICATION OF RESULTS

Results of this study may be published in scientific journals and presented at scientific meetings. Information about what was learned in this study will be available by late Spring or Early Summer on Dr. Volk's research web page (<http://www.brocku.ca/vrbaby/research.html>), as well as through your school.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or want more information, please contact Dr. Volk using the contact information provided above. If you have any questions while you are filling out the forms, please feel free to contact Dr. Volk. This study has been reviewed and approved by the Research Ethics Board at Brock University # 18-052. It has also been approved by the Queen's University Ethics Board and the Niagara Catholic School Board's Ethics Board. If you experience any stress while participating in this study, please refer to the debriefing form for a list of agencies you may contact.

If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your help in this project!

Please keep this form for your records.

Appendix D
Demographics

What is your ID number?

I _____ agree to participate in the study.

1. How old are you?
2. Are you a boy or a girl?
 - a. Boy
 - b. Girl
 - c. Other
 - d. Prefer not to say
3. What grade are you in?
4. Which parents do you live with at home?
 - a. Birth parents
 - b. Adopted parents
 - c. Just mom
 - d. Just dad
 - e. Mom and Stepdad
 - f. Dad and Stepmom
 - g. Other
5. Were you born in Canada?
No. Yes – go to question 7
6. How old were you when you first came to Canada to live?
 - a. 4 years of age or younger
 - b. 5-9 years of age
 - c. 10-14 years of age
 - d. 15 years of age or older

7. Which category **best** describes your race or cultural group? **Mark all that apply.**
- White
 - East Asian (e.g., Chinese, Japanese, Korean)
 - Southeast Asian (e.g., Vietnamese, Filipino, Cambodian, Malaysian, Laotian)
 - South Asian (e.g., East Indian, Pakistani, Sri Lankan, Afghan, Bangladeshi)
 - West Asian or Arab (e.g., Iraqi, Syrian, Lebanese, Egyptian)
 - Black African (e.g., Ghanaian, Kenyan), Black Caribbean (e.g., Jamaican, Haitian) or Black Canadian or American
 - Latin American, Central American, South American (e.g., Mexican, Colombian, Brazilian, Chilean)
 - Indigenous/Native (e.g., First Nations, Métis, or Inuit)
 - Other
8. Compared to the average Canadian, do you think your family is (choose one):
- a. A lot less rich
 - b. Less rich
 - c. About the same
 - d. More rich
 - e. A lot more rich
9. What is the highest level of schooling your parents completed?
- a. They have not completed high school
 - b. Completed high school
 - c. Complete college/university
 - d. Don't know
10. What grade on average do you typically receive in school?
- a. A (80-100%)
 - b. B (70-79%)
 - c. C (60-69%)
 - d. D or lower (59% or lower)
11. What are your plans for when you graduate high school? (**grade 9s only**)

- a. University
- b. College
- c. Work
- d. Other
- e. Not Sure

12. How often have you smoked tobacco cigarettes? (**grade 9s only**)

- a. Never
- b. Once or Twice
- c. Weekly
- d. Daily

13. How often have you vaped? (**grade 9s only**)

- a. Never
- b. Once or Twice
- c. Weekly
- d. Daily

Appendix E
Strengths and Difficulties Questionnaire – Emotional Problems Subscale

1. I get a lot of headaches, stomach-aches or sickness.
 - a. Not true
 - b. Somewhat true
 - c. Certainly true

2. I worry a lot.
 - a. Not true
 - b. Somewhat true
 - c. Certainly true

3. I am often unhappy, downhearted or tearful.
 - a. Not true
 - b. Somewhat true
 - c. Certainly true

4. I am nervous in new situations. I easily lose confidence.
 - a. Not true
 - b. Somewhat true
 - c. Certainly true

5. I have many fears. I am easily scared.
 - a. Not true
 - b. Somewhat true
 - c. Certainly true

Appendix F

Victimization by Bullying and Non-bullying Aggression – Peer Nominations Measure

Nominations for Direct Victimization by Bullying:

1. Who is someone **LESS** popular or strong than you, who **YOU HAVE DONE THESE THINGS TO?**
 - Hitting, kicking, shoving, using physical force
 - Threatening or saying mean things

Nominations for Indirect Victimization by Bullying:

2. Who is someone **LESS** popular or strong than you, who **YOU HAVE DONE THESE THINGS TO?**
 - Spreading negative rumours, leaving you out of a group activity
 - Using a cell phone or internet to send or post hurtful or embarrassing things to someone, or about someone

Nominations for Direct Victimization by Non-bullying Aggression:

3. Who is someone who is **EQUALLY OR MORE** popular or strong than you, who **YOU HAVE DONE THESE THINGS TO?**
 - Hitting, kicking, shoving, using physical force
 - Threatening or saying mean things

Nominations for Indirect Victimization by Non-bullying Aggression:

4. Who is someone who is **EQUALLY OR MORE** popular or strong than you, who **YOU HAVE DONE THESE THINGS TO?**
 - Spreading negative rumours, leaving you out of a group activity
 - Using a cell phone or internet to send or post hurtful or embarrassing things to someone, or about someone