

The Influence of Competitiveness on Aggression and Peer Rejection in Youth over Time
Master's Thesis

Julie Dick

Thesis submitted to the
Faculty of Graduate and Postdoctoral Studies
In partial fulfillment of the requirements
For the Master of Arts in Counselling Psychology degree
Faculty of Education
University of Ottawa

Declaration of academic achievement

Julie Dick, the author of the manuscript, “The Influence of Competitiveness on Aggression and Peer Rejection in Youth over Time” is the primary author of this article. As the primary author, contributions include: the research proposal, literature review, analyzing data, manuscript preparation, as well as manuscript revision. The data used for this manuscript came from the McMaster Teen Study. The investigator of the McMaster Teen Study is the co-author of this manuscript and thesis supervisor, Dr. Tracy Vaillancourt. Dr. Vaillancourt offered input and expertise during each phase of the research development and manuscript preparation. This manuscript will be submitted to an academic article for publication.

Acknowledgements

First and foremost I would like to thank my supervisor, Dr. Tracy Vaillancourt. Thank you for all of your effort, dedication, and guidance. Thank you to my colleagues, the members of the Brain and Behaviour Lab, for your kindness throughout this process – you have helped in more ways than you know. To everyone who has worked on the McMaster Teen Study, thank you for creating something we can all be proud of.

I would like to sincerely thank my committee members, Dr. Diana Koszycki and Dr. Nick Gazzola. I am grateful for your teaching and insight both throughout the program and in regards to my thesis.

To my family and friends, and especially to my parents and Reg, I can truly say I could not have done this without you. Your encouragement and support have made this work a reality and I cannot thank you enough for it. This is for you.

Table of Contents

Abstract.....	1
Introduction.....	2
Competitiveness.....	3
Aggression.....	5
Competitiveness and Aggression.....	6
Aggression and Peer Rejection.....	8
Competitiveness and Peer Rejection.....	9
Current Study.....	10
Methods.....	11
Participants and Procedures.....	11
Measures.....	12
Analytic Plan.....	14
Results.....	14
Discussion.....	16
Limitations and Future Directions.....	21
Implications.....	22
Conclusion.....	23
References.....	25
Tables.....	34
Figures.....	37

List of Tables

Table 1.....	34
Table 2.....	36

List of Figures

Figure 1.....	37
Figure 2.....	38

Abstract

The temporal association between aggression, peer rejection, and competitiveness (i.e., the evaluation of one's own skills and abilities compared to those of another) was examined in a sample of 615 students assessed yearly from grades 7 to 12. Using path analysis, results indicated that competitiveness predicted aggression at every time point with one exception (grade 11 to 12). Competitiveness and peer rejection were found to have a negative reciprocal association, and aggression and peer rejection were shown to be reciprocally related. Competitiveness, aggression, and peer rejection were each statistically significantly stable over time. Implications, limitations, and future directions are discussed.

The Influence of Competitiveness on Aggression and Peer Rejection in Youth over Time

Humans are faced with social challenges every day and navigating through them can be confusing and difficult. Youth, specifically, deal with difficult social situations weekly, if not daily, such as finding a social group, gaining access into the peer group, establishing social status, and maintaining this status. It is not surprising then that some youth can have difficulties fostering and sustaining meaningful relationships (Green & Rechis, 2006). Navigating social situations can be further complicated if a youth has behavioural tendencies or personality characteristics that prevent him/her from connecting well with others.

Youth often create and are part of conflicts and it is important that they learn how to deal with conflict in their peer groups. Youth may defend themselves and peers, comply or accede with the competitor, become aggressive or domineering, refrain from or suffer through the conflict, or behave in a provoking manner (Davidson, Walton, & Cohen, 2013). When part of a conflict, youth's ability to evaluate their own thoughts, feelings, motivations, and personality (and that of others) will influence how they react to the situation (Davidson et al., 2013). For a child to be accepted into a social group, proficiency is required in several different areas such as perspective taking and cognitive and emotional flexibility (Green & Rechis, 2006). The ability to successfully navigate adolescent friendships and peers' potentially opposing interests requires emotional and behavioural skills that are appropriate to the social context (Davidson et al., 2013). As this can be difficult for even socially capable youth, those who are less skilled would have notable challenges with integrating themselves into a peer group (Green & Rechis, 2006; Roseth, Johnson, & Johnson, 2008).

One personality trait that could be an issue is competitiveness. High levels of competitiveness can be linked to behaviour that is negatively perceived by peers (Hibbard & Buhrmester, 2010), such as aggression (Adachi & Willoughby, 2011; Adachi & Willoughby, 2013, Green & Rechis, 2006, Hibbard & Buhrmester, 2010; Matthews & Angulo, 1980). Aggressive behaviour is linked to peer rejection (Gelb & Jacobson, 1988) and maladjustment in youth (Bowker & Etkin, 2014; Crick, Ostrov, & Werner, 2006). Two pathways may explain these associations – trait competitiveness leads to aggression, and in turn, to peer rejection, or peers reject the competitive child due to this competitive personality trait, leading to the rejected youth becoming aggressive. To date, it is unclear what the temporal relation is between aggression, rejection, and competitiveness. Accordingly, the purpose of the present study was to

examine these pathways over time in a sample of Canadian youth assessed yearly from grades 7 to 12.

Competitiveness

Competitiveness is a salient and pervasive personality trait (Newby & Klein, 2014; Smither & Houston, 1992) that may hinder positive relationship building. Trait competitiveness has been described as “the enjoyment of interpersonal competition and the desire to win and be better than others” (Spence & Helmreich, 1983, p. 41). Competitiveness involves comparing the abilities or potential of another person to oneself to exceed the other and achieve an objective (Jiang, Huang, & Chen, 2012).

Competitiveness and *competition* are not always distinguished or defined in the literature and the terms can be unclear. Competitiveness is a desire to win or excel and develop personally; this is typically observed across most contexts of an individual’s life and is part of one’s personality (Green & Rechis, 2006; Jiang et al., 2012; Newby & Klein, 2014; Smither & Houston, 1992). Competition occurs when there is a desire or need to win within a particular context, such as a sporting event or video game; further, the individual does not necessarily have to be better or more skilled than others, as long as they are victorious (Ommundsen et al., 2005; Wang et al., 2014). For example, a youth playing competitive soccer can have a strong desire to win a game, yet he or she may not have the need to be the best player on the team or in the league. The youth is more focused on winning the competition. Most often, competition literature examines sports (e.g., Ommundsen et al., 2005), and more recently, video games (e.g., Adachi & Willoughby, 2011; Adachi & Willoughby, 2013). Parents, coaches, and other supportive adults may influence the development of competitiveness in youth by emphasizing the need to win (Fletcher & Nusbaum, 2008). In these cases, there may be conflict between the promotion of winning and that of working with others in order to achieve a goal (Fletcher & Nusbaum, 2008).

Research examining the development of competitiveness in children or youth is scarce. Some researchers have found an association between childhood competitiveness and adult competitiveness (e.g. Bergman & Magnusson, 1986; Matthews & Avis, 1983), yet these studies are not current and have focused primarily on Type A behaviour, which will be described subsequently in the literature review, rather than trait competitiveness. The majority of development research has examined competitiveness in contrast to other personality traits.

Competitiveness has been linked to extraversion, depression, anxiety, neuroticism, low self-esteem (Bing, 1999; Collier, Ryckman, Thornton, & Gold, 2010; Gelb & Jacobson, 1988; Houston, Harris, Howansky, & Houston, 2015), and, of particular interest to the current study, aggression (Adachi & Willoughby, 2013; Matthews & Angulo, 1980). Competitiveness has also been linked to socioemotional maladjustment, especially for girls, and a lack of empathy (Hibbard & Buhrmester, 2010). Competitiveness is not necessarily dichotomous, but may manifest along a spectrum; some may be mildly competitive while others are extremely so (Bing, 1999; Gelb & Jacobson, 1988; Hibbard & Buhrmester, 2010; Houston et al., 2015). It is unclear whether or not competitive behaviour can be classified as healthy or unhealthy as it has benefits and detriments (e.g., Gill, 1986; Hibbard & Buhrmester, 2010; Newby & Klein, 2014; Ommundsen, Roberts, Lemyre, & Miller, 2005). This may be due to the apparent lack of agreement of the definition of competitiveness, resulting in variations in how competitiveness is categorized and defined in research (Green & Rechis, 2006; Newby & Klein, 2014).

The motivation and perception of the individual can determine whether competitiveness would help or hinder. Some want to excel and be the best that they can be, while others want to be superior to everyone to the point of being ruthless and egotistical (Collier et al., 2010; Green & Rechis, 2006; Hibbard & Buhrmester, 2010; Newby & Klein, 2014). Research conducted by Hibbard and Buhrmester (2010) indicated that there are two motives and dispositions that account for most competitive thoughts and behaviour: (1) the aim to outperform, surpass, and be greater than others and (2) the aim to perform well as an individual. Competitiveness may also serve as a promoter of dominance. When competing to perform well, competitive individuals regard competitors with respect and consider challenges as opportunities for self-development and self-discovery (Collier et al., 2010). An individual competes to enhance his or her own self as a personal goal, to display self-competence, accomplishments, and self-improvement (Newby & Klein, 2014). Winning is still essential to achieve success, yet not to the detriment of others. Competing to win at all costs, in any, and sometimes inappropriate situations and without care or concern for others is known as interpersonal competitiveness or hypercompetitiveness (Bing, 1999; Newby & Klein, 2014; Ryckman, Libby, van den Borne, Gold, & Lindner, 1997). Girls who compete to win have been shown to be more likely to experience depressive symptoms and had less empathy for others than boys (Hibbard & Buhrmester, 2010). Competing to excel has

been linked to higher self-esteem and lower depressive symptoms for both girls and boys (Hibbard & Buhrmester, 2010).

Previous research indicates that there are sex differences in the expression of competitiveness. Boys tend to have more trait characteristics relating to competitiveness and their competitive behaviour is more accepted than it is for girls (Gill, 1986; Hibbard & Buhrmester, 2010). Competitive tasks can influence youth's behaviour, particularly boys (Archer & Webb, 2006; Green & Rechis, 2006; Hibbard & Buhrmester, 2010). Boys have been shown to have a stronger orientation to win, whereas girls tend to use competitiveness to achieve personal goals (Gill, 1986; Martinho, Albergaria-Almeida, & Dias, 2015). Sex differences may be in part due to social norms and expectations. That is competitiveness is typically considered a male stereotype (Johnson & Diekman, 2015). Men are more competitive and have more favourable opinions toward competition than woman, especially in situations when there are greater rewards associated with competition (Martinho et al., 2015). In a study by Hibbard and Buhrmester (2010), men were significantly more likely to compete to win than women; this finding held across self, friend, and parent ratings. There was no significant difference between men and women when individuals were competing to personally excel (Hibbard & Buhrmester, 2010). There are relatively few studies that examine competitiveness and sex differences in youth, as well as how competitiveness develops in youth.

Aggression

Aggression is defined as behaviour with destructive objectives aimed to harm another person (Dodge, Coie, & Lynham, 2006). Often, aggression can be used to increase one's social status within a group (Vaillancourt & Hymel, 2006). A higher standing within the group may act as a protective factor against exploitation from others and aid in the promotion of particular reputations (Bernard, 2013). For example, aggression can be used as a form of intimidation; youth can establish status of being a formidable opponent or one who should not be challenged, possibly resulting in a negative reputation (Bernard, 2013). Boys have been shown to have higher levels of overt aggression than girls and comparable levels of relational aggression (Card et al., 2008).

In a study by Coyne et al. (2008), adolescents were asked to watch a video of either a boy being relationally aggressive to another boy, or a girl to another girl. Participants were then asked to rate whether or not the aggressor was justified for his or her behaviour. Participants'

ratings were higher after watching the boy's video compared to the girl's. Typically the boys were seen as being more justified for their behaviour. The script and surroundings were the same in each video, with the only difference being the sex of the aggressor and the victim. Yet the ratings for justification were distinct.

Boys' aggressive behaviour has been shown to be viewed as more acceptable, as 'boys will be boys' whereas girls should not engage in such behaviour (Coyne et al., 2008; Terrell, Hill, & Nagoshi, 2008). This is especially true of displays of physical aggression (Collier et al., 2008; Matthew & Angulo, 1980). Yet the results of the study by Coyne et al., (2008) demonstrate that even relational aggression is considered more justified when carried out by boys than girls. There is emerging research that aggression should be measured distinctly between sex (Terrell et al., 2008). Men and boys have been found to use more physical and direct forms of aggression compared to women and girls (Card et al., 2008). With regard to relational aggression, research suggest that girls and women use it slightly more than boys and men (Card et al., 2008; Vaillancourt, 2013). Some researchers have proposed that the difference between boys' and girls' use of relational aggression is "trivial" compared to differences in overt aggression (Card et al., 2008), while others have argued that mean differences mask important sex differences in proportions with girls and women exclusively using relational aggression and boys and men using a melange of aggressive tactics (Vaillancourt et al., 2013). For the current study, a composite was created to measure aggression; therefore we did not measure sex differences across different forms of aggression, but we did consider sex differences when examining the temporal sequence between competitiveness, aggression, and peer rejection.

Competitiveness and Aggression

Although there has been a great deal of research examining the relation between competition and overt aggression (e.g., Adachi & Willoughby, 2011; Adachi & Willoughby, 2013, Green & Rechis, 2006, Hibbard & Buhrmester, 2010), there is far less research examining the links between *trait competitiveness* and aggressive behaviour. Often, aggression can be used to increase one's social status within a group (Vaillancourt & Hymel, 2006). One possible explanation that accounts for the link between competitiveness and aggression is reputation. Having a reputation for escalating conflict is an indicator of high competitiveness (Crowley, 2001; Johnstone & Bshary, 2004). Youth may behave aggressively toward others in order to establish a particular reputation, resulting in peer rejection due to their aggressive behaviour.

Alternatively, competitive behaviour as a result of a negative reputation or peer rejection could influence youth to behave aggressively to intimidate peers and decrease further rejection. The sequence has yet to be determined. A higher standing within the group may act as a protective factor against exploitation from others and aid in the promotion of particular reputations (Bernard, 2013).

Competitive individuals appear to be drawn toward situations where competition lies, such as occupations with a higher level of competitiveness (Brown, Cron, & Slocum, 1998; Houston et al., 2015). Competitive individuals not only value performance, but are more likely to set challenging goals (Brown et al., 1998). Those who are highly competitive win the majority of conflicts that they are a part of and less competitive individuals lose more conflicts (Bernard, 2013). Competitive behaviour of youth may result in success within conflicts. With this in mind, highly competitive individuals profit from and may seek out conflict to achieve personal and professional goals (Bernard, 2013; Brown et al., 1998).

If one has a history of aggression, other individuals are less likely to behave aggressively toward him or her, as the former has likely received this reputation as being aggressive through his or her competitive ability to win conflicts (Bernard, 2013). In this way, competitive individuals accomplish their goals. They may exhibit aggressive behaviour to win the conflict. Because of this behaviour, researchers suggest that competitiveness leads to aggression (e.g., Bernard, 2013; Hibbard & Buhrmester, 2010). Yet, youth may feel more comfortable excluding the aggressor rather than challenging them in order to change their behaviour. This could explain why some aggressive individuals are rejected; peers do not want to deal with the consequences of confronting them and begin to dislike them, as well as exclude them from the group.

Often, competitiveness and aggression are linked together through Type A behaviour (Bergman & Magnussen, 1986; Gomez, 1998; Matthews & Angulo, 1980; Siegel & Leitch, 1981). The characterization of Type A behaviour can be quite broad, including cognitive, emotional, and personality aspects; it is expressed as high levels of drive, impatience, irritability, activity speed, and of concern to the current study, competitiveness and aggression (Bergman & Magnussen, 1986; Gomez, 1998; Matthews & Angulo, 1980; Matthews & Avis, 1983; Siegel & Leitch, 1981; Steinberg, 1986). Research by Matthews and Angulo (1980) described children with Type A behaviour, including high levels of competitiveness and aggression, as aggressive, restless, not able to keep still, squirming, interrupting, etc. This type of behaviour can also be

seen in Type A adults, including interrupting, annoyance, hostility, impatience, and explosiveness. Type A behaviour has been shown to be stable over time (e.g., competitiveness and aggressiveness; Siegel & Leitch, 1981). Type A individuals aim to be the best person across many contexts and are therefore very competitive in nature. These people will behave aggressively in order to gain what they want, and also tend to express more aggression in general (Bergman & Magnussen, 1986; Gomez, 1998; Matthews & Angulo, 1980; Siegel & Leitch, 1981). There is relatively little recent research on Type A behaviour that relates to the current study; however, the influential nature of this association deserves attention to demonstrate the link between these two concepts.

As mentioned, competitiveness is connected to interpersonal situations; therefore, competitors are necessary to function as benchmarks for a person to set performance standards and goals (Smither & Houston, 1992). This comparison can potentially create a rivalry, whether actual or perceived, for a competitive individual. A person may begin to see competitors as rivals, changing their behaviour toward others. In some cases, rivals may interact in a positive or respectful manner; in other cases, this behaviour may manifest as aggression.

Aggression and Peer Rejection

Humans have a fundamental need to be accepted by others (Baumeister & Leary, 1995). This may be challenging, as individuals can be liked or disliked by peers for a number of reasons. Peer rejection is defined as being actively disliked by peers (Coie, Dodge, & Coppotelli, 1982; Wang, McDonald, Rubin, & Laursen, 2012) and is a strong predictor for psychological maladjustment, especially in early adolescence (Bowker & Etkin, 2014; Gelb & Jacobson, 1988). Children who are disliked by peers are more likely to develop conduct disorders, have academic issues, and experience mental health difficulties (Gelb & Jacobson, 1988; McDougall, Hymel, Vaillancourt, & Mercer, 2001).

Previous research has shown that peer groups judge a target's characteristics to determine if they would be an acceptable addition to the group (Richardson, Hitti, Mulvey, & Killen, 2014). Youth are more likely to be rejected from the group if their behaviour varies from the group norm (Dijkstra, Lindenberg, & Veenstra, 2008). This non-normative behaviour includes aggression; both overt aggression and relational aggression are strongly linked to peer rejection (e.g., Archer & Coyne, 2005; Dijkstra et al., 2008; Dodge, Coie, & Brakke, 1982; Fite, Hendrickson, Rubens, Gabrielli, & Evans, 2013; Vaillancourt & Hymel, 2006, White & Kistner,

2011; see also review by McDougall et al., 2001), and the effects of such rejection can also be harmful (Bowker & Etkin, 2014; Crick, Ostrov, & Werner, 2006). This research supports an argument that aggression predicts peer rejection.

There is also evidence to support the notion that youth rejected by peers may aggress, resulting in further exclusion (Hubbard, 2001; Reijntjes et al., 2011). Even when early aggression was accounted for, peer rejection experienced in early childhood has been shown to predict aggressive behaviour in late childhood (Dodge, Bates, & Pettit, 1990; Werner & Crick, 2004). These responses could act to further exclude youth from social groups. Reijntjes et al. (2011) demonstrated that the majority of youth perceiving rejection become progressively more aggressive as time goes on. This pattern could be due to the modification of perceptions of social cues, as those who are rejected begin to perceive cues as confrontational and hostile in nature, resulting in aggressive behaviour (Crick & Dodge, 1994).

Some research has indicated that aggression exclusively predicts peer rejection over time, especially when self-reported from youth. However, other studies have shown that rejection can be a unique predictor of aggression and other externalizing behaviour, particularly when reported by others (Prinstein & La Greca, 2004). With conflicting results from previous literature, it is important to examine these concepts to explore the sequence in which they occur.

Some studies have explored sex, peer rejection, and aggression. It has been shown that peers are likely to reject aggressive boys, while aggressive girls are likely to be both rejected and accepted by peers (Dijkstra, Lindenberg, & Veenstra, 2007; Lee, 2009; McEachern & Snyder, 2011). This could be the result of more complex and cunning forms of aggression that girls use, such as relational aggression, which may motivate peers to accept the aggressor for fear of being a future target (Lee, 2009; Vaillancourt, in press). However, one could theorize that these sex differences emerge due to disparate forms of aggression, rather than variations in how boys and girls distinctly experience peer rejection.

Competitiveness and Peer Rejection

Youth are at a complicated point in their lives regarding social interactions; they are pressured to become successful in academics and establish a foundation for a future career (Green & Rechis, 2006; Hibbard & Buhrmester, 2010), while attempting to create and foster close relationships with others (Adachi & Willoughby, 2013; Green & Rechis, 2006; Hibbard & Buhrmester, 2010). The need to compete to advance and excel can be at odds with the desire to

establish significant friendships; competitiveness can be beneficial for progressing at the individual level, yet may be detrimental to facilitating intimate relationships (Green & Rechis, 2006; Hibbard & Buhrmester, 2010).

Some competitive individuals want to achieve outcomes that benefit their needs and goals, potentially at the detriment of others' achievement (Roseth, Johnson, & Johnson, 2008), which could strain peer relationships. Competitiveness has been negatively associated with facets of friendliness and cheerfulness (Fletcher & Nusbaum, 2008). Competitiveness has also been linked to socioemotional maladjustment, especially for girls, and a lack of empathy (Hibbard & Buhrmester, 2010). Competitive individuals, though outgoing, may have difficulties establishing or maintaining relationships due to these potential issues. However, there is little literature examining the association between competitiveness and peer rejection over time.

Boys and girls are both subject to being rejected by peers, yet boys have been shown to experience higher rates of peer rejection than girls (Coie, Dodge, & Kupersmidt, 1990). Sex differences across peer rejection were analyzed in the current study.

Current Study

The role competitiveness plays in the aggression-rejection link is unclear. It is likely that competitiveness with the intention to win will be associated with peer rejection because competitive youth are less agreeable and thus are less likely to be integrated into a group than more agreeable youth (see Ross, Rausch, & Canada, 2003). Additionally, competitiveness has been linked to aggression (e.g., Bergman & Magnusson, 1986; Coie et al., 1995; White & Kistner, 2011). Though these links have been established, it is not known how competitiveness relates to both concepts, nor is the temporal pattern between competitiveness, aggression, and peer rejection known. In the current study, we examined how this sequence unfolds. We also examined the moderating role of sex considering evidence that boys are typically being more competitive, aggressive, and rejected by peers than girls (Card et al., 2008; Coie et al., 1990; Hibbard & Buhrmester, 2010; Johnson & Diekmann, 2015; Martinho, Albergaria-Almeida, & Dias, 2015).

It was predicted that both aggression and rejection would be linked to competitiveness, given previous research (Adachi & Willoughby, 2011; Adachi & Willoughby, 2013, Green & Rechis, 2006; Hibbard & Buhrmester, 2010), and that competitiveness, as a trait, would predate both aggression and peer rejection. As shown by the literature, there is evidence that aggression

predicts peer rejection, but also that peer rejection predicts aggression (Archer & Coyne, 2005; Dijkstra et al., 2008; Dodge et al., 1982; Fite et al., 2013; Vaillancourt & Hymel, 2006, White & Kistner, 2011). However, there has been more evidence supporting the link between competitiveness and aggression than that of competitiveness and peer rejection, especially in youth. Therefore, though the temporal sequence is uncertain, it was predicted that aggression would predate peer rejection in youth. In examining this temporal pattern we controlled for family income as previous research has found relations between aggressive behaviour and socioeconomic status concepts such as parent income in childhood and adolescence (Wahl & Metzner, 2012). Ethnicity was also controlled for, as trajectories of aggression have been shown to vary between ethnic groups in previous literature (Reingle, Maldonado-Molina, Jennings, & Komro, 2012). Finally, we examined sex differences and predicted that boys would be higher on trait competitiveness, aggression, and peer rejection than girls.

Methods

Participants and Procedures

Participants were recruited to take part in the McMaster Teen Study, a longitudinal and ongoing study researching the links between bullying, mental health, and academic achievement. Data collection began in spring of 2008 when participants were in grade 5 (T1), and continued annually until the spring of 2015 when participants were in grade 12 (T8). Participants were recruited from grade 5 classrooms that were selected from a random sample of 51 schools in a southern Ontario school board. Parents were asked for consent and students for assent in the spring of each year. Participants were compensated for taking part in the study, and payment increased incrementally each year (e.g., T1=\$5 (CAN) to T8= \$50 (CAN)). Data from youth's surveys were collected in school in T1, and participants were given the choice to complete paper or online questionnaires in the privacy of their own home from T2 to T8. The study has maintained annual approval status from the university research ethics board.

Eight-hundred and seventy-five students agreed to participate in the longitudinal arm of the study at T1, representing 80% of students approached. Seven-hundred and three (80%) of these participants participated in at least one other time point from T2 to T8. For the current study, time points three (grade 7) to eight (grade 12) were used, as this was the period when data for competitiveness were collected. Participants with at least one data point for the measures of interest were included in the current study. Thus, data for 615 participants were available for this

study (70.3% of longitudinal cohort) which included slightly more girls ($N = 334$, 54.3%) than boys ($N = 281$, 45.7%). Youth were predominantly European-Canadian (64.1%; Middle-Eastern-Canadian, 1.8%; African/West-Indian-Canadian, 3.1%; Asian-Canadian, 1.5%; South-Asian-Canadian, 2.4%; Native-Canadian, 1.3%; South/Latin American-Canadian, 0.8%; Other, 3.3%; Did not know, 11.9%; Missing, 9.9%).

Non-participants (i.e. participants from the McMaster Teen Study who were not included in the current study due to not having data on the selected variables in T3-T8) and those participants selected for the analytic sample were compared using a series of t -tests and chi-square tests using SPSS on prior reports of parental education, parental income, sex, and ethnicity (dichotomized into categories of white and non-white) to determine if the two groups significantly differed from one another. Non-participants significantly differed from longitudinal participants on parent's level of education ($t(805) = -7.68$, $p < .001$), parent's level of income ($t(770) = -6.67$, $p < .001$), and sex ($\chi^2(1) = 18.69$, $p < .001$).

Data from the analytic sample were examined to determine the pattern of missingness. The results of the Little's Missing Completely at Random test (Little, 1988), $\chi^2 = 805.96$, $df = 722$, $p = .016$, indicated that data from participants included in the current study were not missing completely at random. On average, 22.2% (range = 11.2 - 29.4% missing) of data were missing on each variable. A series of t -tests were conducted to explore mean-level differences of each variable based on missing values of other variables. The Bonferroni correction was applied to correct for multiple testing and to reduce the probability of acquiring false-positive results. According to the results of these analyses, participants missing competitiveness data at T4 ($N = 38$, $M = 0.45$) had lower levels of peer rejection at T7 than those who had competitiveness data ($N = 396$, $M = 1.06$; $t(115.7) = 4.3$, $p < .001$). Participants missing aggression data at T4 ($N = 37$, $M = 0.46$) had lower levels of peer rejection at T7 ($N = 397$, $M = 1.05$; $t(108.9) = 4.2$, $p < .001$). Participants missing peer rejection data at T4 ($N = 37$, $M = 0.46$) also had lower levels of peer rejection at T7 ($N = 397$, $M = 1.05$; $t(108.9) = 4.2$, $p < .001$). As only 3 of our 284 t -tests were found to be significant, we considered our data to be missing at random.

Measures

Competitiveness. The Matthews Youth Test for Health (MYTH; Matthews & Angulo, 1980; Matthews & Avis, 1983) – Competitive Index Sub-scale was used to measure competitiveness in youth. The MYTH is an eight item self-report measure. The competitive

achievement-striving subscale was the main interest of the current study to measure competitiveness. The content of the other MYTH subscale (e.g., impatience-aggression subscale) was covered by other measures used in the MAC-Teen study; therefore, in order not to burden participants with too many measures, this subscale was not included in the study. Sample items include: “I like being the best at everything (sports, school, work, etc.)” and “I hate losing at games.” A 5-point Likert scale was used to measure participants’ scores ranging from “False – Not at all true” to “Very true of me.” Higher scores signified higher competitiveness. The MYTH was shown to be a reliable and consistent measure in the current study (T3 $\alpha = .83$; T4 $\alpha = .84$; T5 $\alpha = .86$; T6 $\alpha = .88$; T7 $\alpha = .85$; T8 $\alpha = .86$), and has been shown to have excellent test-retest reliability ($\alpha = .90$; Matthews & Angulo, 1980; Matthews & Avis, 1983). Items were averaged to create a composite competitiveness score for each individual at each time point.

Aggression. The Aggressive Behaviour Scale (ABS; Little, Henrich, Jones, & Hawley, 2003) was used to measure different forms of aggression. The ABS is a self-report measure which assesses six forms of aggression: pure-overt, reactive-overt, instrumental-overt, pure-relational, reactive-relational, and instrumental-relational. Each form of aggression was assessed using six items rated in a 4-point Likert scale ranging from “Not at all true” to “Completely true.” For the current study, aggression was examined as a total composite score of all aggression types. Sample items include: “I often tell my friends to stop liking someone to get what I want” and “I’m the kind of person who hits, kicks, and punches others.” The Aggressive Behaviour Scale has been shown to have stable goodness of fit in terms of age, gender, and ethnicity, as well as good internal consistency for both overt and relational aggression subscales (coefficient alphas of .79 to .84 for overt aggression scales, .62 to .78 for relational aggression scales; Little et al., 2003). The internal consistency was good for each time point of the current study (T3 $\alpha = .88$; T4 $\alpha = .89$; T5 $\alpha = .89$; T6 $\alpha = .89$; T7 $\alpha = .90$; T8 $\alpha = .90$).

Perceived Peer Rejection. The Behavior Assessment System for Children, Second Edition (BASC-2; Peer Rejection subscale; Reynolds & Kamphaus, 2004) was used to measure perceived rejection from peers. The BASC-2 is a self-report measure examining multiple dimensions of perceptions and behaviour of individuals. Sample items include: “My classmates don’t like me” and “Other kids hate to be with me.” Participants answered “true/false” questions as well as questions using a 4 point Likert scale (“never,” “sometimes,” “often,” “always”) to determine how they felt that they were liked or disliked by peers. The scales were shown to have

good consistency (coefficient alphas of .74 and .70; Reynolds & Kamphaus, 2004). The peer rejection measure had good reliability at each time point for the current study (T3 $\alpha = .79$; T4 $\alpha = .81$; T5 $\alpha = .78$; T6 $\alpha = .82$; T7 $\alpha = .83$; T8 $\alpha = .74$). The items were summed to create a composite score of peer rejection.

Household income. Reports of household income were completed by the person most knowledgeable about the child (PMK). PMK household income was reported at T1 using groups ranging from \$20,000 to more than \$80,000.

Analytic Plan

Path analyses were performed using AMOS version 23.0 (Arbuckle, 2014) to examine the stability, within time relations among constructs, and the cross lag paths of competitiveness, aggression, and peer rejection over time. Fit indicators used for analysis were: the comparative fit index (CFI) with values of .90 and higher demonstrating adequate fit and .95 and higher demonstrating close fit; the root mean square error of approximation (RMSEA) with values less than .05 demonstrating close fit, less than .08 demonstrating adequate fit, and lower values demonstrating better fit; and Chi-square test to take the large sample and deviation from normality into account (Browne & Cudeck, 1992; Hu & Bentler, 1999; Kline, 2011).

Results

Data were first tested for assumptions of normality. All values of skewness and kurtosis were below the recommended values of 3 for skewness and 10 for kurtosis, suggesting that significant deviations from normality were not a concern regarding the variables of interest (Kline, 2011). Fit indices indicated an acceptable fit for the model, CFI = .93, RMSEA = .08. Ethnicity and parent income were controlled for in the analysis. Missing data were accounted for by using the full information maximum likelihood (FIML) function in AMOS.

Means, standard deviations, and sex difference tests for competitiveness, aggression, and peer rejection at each grade are provided in Table 1. Significant sex differences were found for competitiveness at T3 ($t(543) = 4.10, p < .001$), T4 ($t(506) = 3.68, p < .001$), T5 ($t(485) = 2.83, p = .005$), T6 ($t(447) = 3.27, p = .001$), T7 ($t(432) = 3.59, p < .001$), and T8 ($t(447) = 4.10, p < .001$), with boys being more competitive than girls at each time point. Sex differences were also found for peer rejection, with girls being more rejected than boys at T3 ($t(544) = -2.97, p = .003$), T5 ($t(484) = -3.35, p = .001$), T6 ($t(445) = -4.76, p < .001$), T7 ($t(432) = -4.59, p < .001$), and T8 ($t(444) = -2.65, p = .008$). No sex differences were found for aggression.

Bivariate correlations were conducted for all three constructs (Table 2). Many statistically significant correlations were found. Competitiveness was positively correlated with itself at all time points ($r = .50-.78, p < .05$). There were positive correlations between all the time points for aggression ($r = .36-.73, p < .05$). All of the time points for peer rejection were also positively correlated ($r = .20-.61, p < .05$). Results demonstrated significant positive correlations between competitiveness and aggression within each time point ($r = .17-.23, p < .01$). Competitiveness was significantly negatively correlated to peer rejection at T3 ($r = -.10, p < .05$). Finally, within each time point, aggression and peer rejection were significantly positively correlated ($r = .24-.34, p < .01$).

Competitiveness, Aggression, and Rejection Model

The model included competitiveness (COMP), aggression (AGG), and peer rejection (REJ). A sequence of path models were conducted to determine if and how these concepts predicted each other over time. Figure 1 illustrates the statistical model and standardized coefficients for competitiveness, aggression, and peer rejection. Each variable was highly stable over time (T3 COMP to T8 COMP, $b = 0.73-0.80, p < .001$; T3 AGG to T8 AGG, $b = 0.54-0.75, p < .001$; T3 REJ to T8 REJ, $b = 0.42-0.64, p < .001$). There were several significant associations within the same time point: COMP and AGG (T3 $r = 0.07, p < .001$; T4 $r = 0.02, p = .004$; T7 $r = 0.02, p = .003$; T8 $r = 0.02, p < .001$); COMP and REJ (T3 $r = -.15, p = .040$); and AGG and REJ, which were significantly linked at each time point ($r = 0.06-0.10, p < .001$).

The paths from T3 COMP to T4 AGG ($b = 0.03, p = .013$), T3 AGG to T4 REJ ($b = 0.65, p = .003$), T4 COMP to T5 AGG ($b = 0.03, p = .020$), T4 REJ to T5 AGG ($b = 0.02, p = .021$), T5 COMP to T6 AGG ($b = 0.02, p = .048$), T5 REJ to T6 COMP ($b = -.05, p = .018$), T6 COMP to T7 AGG ($b = 0.02, p = .029$), T7 COMP to T8 REJ ($b = -0.17, p = .006$) and T7 AGG to T8 REJ ($b = 0.95, p < .001$) were all statistically significant.

Indirect effects were examined in MPlus v7.1 (Muthén & Muthén, 2011). The indirect pathway from T3 AGG to T4 REJ to T5 AGG did not reach statistical significance ($b = 0.01, p = .084$). The indirect pathway from T3 AGG through T4 and T5 REJ to T6 COMP similarly did not reach statistical significance ($b < -0.00, p = .082$).

Sex Differences

To determine if there were unique effects between boys and girls, sex differences in cross-lagged paths were tested using a multi-group analysis in Amos (Arbuckle, 2014). The

statistical model and standardized coefficients for competitiveness, aggression, and peer rejection across sex are provided in Figure 2. Using a Chi-square difference test to freely estimate the boys' model against the girls' model, each path was constrained to be equal across groups to test for sex differences. The Chi-square difference test was significant ($\Delta\chi^2(75) = 118.00, p = .001$) indicating that there were sex differences in the model. The model had good fit, $\Delta\chi^2(180) = 576.71, p < .001$, CFI = .91, RMSEA = .06. Results indicated significant paths from T3 COMP to T4 AGG (girls $b = 0.05, p = .002$) and T3 AGG to T4 COMP (girls $b = -0.36, p = .020$) for girls only. Boys scored higher on AGG from T3 to T4 than girls (boys $b = 0.83, p < .001$; girls $b = 0.65, p < .001$). Girls rated higher than boys for both T4 REJ to T5 REJ (boys $b = 0.13, p < .001$; girls $b = 0.55, p < .001$) and T6 COMP to T7 COMP (boys $b = 0.62, p < .001$; girls $b = 0.79, p < .001$).

Discussion

To date, there does not appear to be any longitudinal research exploring youth competitiveness, aggression, and perceived peer rejection. Accordingly, in the current study, we examined the links between competitiveness, aggression, and perceived peer rejection in youth over time to generate a better understanding of the temporal sequence. Youth completed yearly self-report measures across six time points, and path analysis was used to test the temporal sequence of these associations. We predicted that competitiveness would predate aggression and peer rejection, and that aggression would predict peer rejection based on links between competitiveness and aggression (Adachi & Willoughby, 2013; Green & Recheis, 2006, Hibbard & Buhrmester, 2010) and aggression and peer rejection (Archer & Coyne, 2005; Dijkstra et al., 2008; Dodge et al., 1982; Fite et al., 2013). Our results suggest that competitiveness initiates the cascade which predicts aggression. Links to peer rejection were less clear. Results from the current study were consistent with the literature that competitiveness is indeed a predictor of aggression in youth. However, findings between competitiveness and peer rejection were inconsistent, with few significant associations being found. The relation between aggression and peer rejection appeared to be bidirectional.

Within the three constructs, competitiveness was positively correlated at every time point, as were aggression and peer rejection, respectively. Results from the path analysis indicated that competitiveness, aggression, and peer rejection were each highly stable over time. This suggests that competitiveness can be viewed as a stable personality trait. It also supports previous

literature that aggression and peer rejection are stable over time (Archer & Coyne, 2005; Coyne et al., 2006; McDougall et al., 2001; Vaillancourt & Hymel, 2006).

Descriptive Findings

Attending first to descriptive findings, results indicated that boys were more competitive than girls, consistent with other studies (Hibbard & Buhrmester, 2010; Johnson & Diekman, 2015; Martinho et al., 2015). There were no differences between boys and girls in regards to levels of aggression. This may be due to the fact that composites were created using various forms of aggression. Separating aggression into overt and relational forms may yield different findings between boys and girls, as boys tend to use more overt forms of aggression while girls are more likely to use relational forms of aggression (Card et al., 2008).

Competitiveness and Aggression

Competitiveness and aggression were positively correlated at nearly every time point. This supports previous literature linking the concepts together (Adachi & Willoughby, 2011; Adachi & Willoughby, 2013; Archer & Coyne, 2005; Bernard, 2013; Fite et al., & Evans, 2013; Green & Rechis, 2006, Hibbard & Buhrmester, 2010; Vaillancourt & Hymel, 2006).

The stability estimates found in the current study add to the literature by demonstrating results from six consecutive years from children in grades 7 to 12. In line with previous research (Bernard, 2013; Green & Rechis, 2006, Hibbard & Buhrmester, 2010), results from the path analysis also indicated that competitiveness and aggression were related within time for the majority of the assessment periods, at grades 7, 8, 11, and 12. Competitive youth tend to display more aggressive behaviour, or aggressive youth behave more competitively. This is especially observed in sports (Ommundsen et al., 2005), but has yet to be thoroughly researched in other domains.

Competitiveness was shown to predict aggression at every time point, except grade 11 to 12. There are several viable interpretations as to why this prediction would occur. Competitiveness as a predictor for aggression has been explored recently, yet only in particular contexts (e.g., video games; Adachi & Willoughby, 2013), and not longitudinally. In the current study, this relation was only observed in one direction, suggesting that competitiveness predicts aggression, and not the reverse. This is consistent with some previous literature. Individuals may behave aggressively after setting goals as a means to achieve them and to win conflicts (e.g., Bernard, 2013; Hibbard & Buhrmester, 2010). Regarding the exception to this association from

grade 11 competitiveness to grade 12 aggression our missing data analysis suggests that aggressive participants were more likely to drop-out of the study in later timepoints (27% of the T8 aggression data was missing) than less aggressive participants which may explain this null finding. Though this result was not significant, it demonstrates that data on aggression youth were missing in grade 12. It is also possible that the null finding was due to a normative developmental trend. Researchers have shown that physical aggression levels tend to decrease as youth age (Cleverley, Szatmari, Vaillancourt, Boyle, Lipman, 2012; Côté, Vaillancourt, LeBlanc, Nagin, and Tremblay, 2006). Accordingly, behaving aggressively in late adolescence, especially in a physical manner, is developmentally inappropriate (Cleverley et al., 2012).

Some individuals compete to establish dominance within a context, to gain access to a resource, or to be superior over others (Archer & Webb, 2006). Dominant competitiveness is often linked to aggression (Archer & Webb, 2006). Competitiveness and aggression can also be linked by reputation (Bernard, 2013). That is, to win conflicts, competitive individuals will establish a certain reputation by behaving aggressively (Bernard, 2013). Competitiveness to achieve status and success can be accomplished with aggression. This is one possible explanation for the association between competitiveness and aggression. Thus, competitiveness activates the sequence whereby youth display aggressive behaviour. However, the role of peer rejection is unclear.

Competitiveness and Peer Rejection

Contrary to expectations, there were several negative correlations between competitiveness and peer rejection, based on negative attributions that peers may have against competitive youth. A positive correlation was expected based on research that competitiveness may inhibit the facilitation of friendships and relationships (Green & Rehis, 2006; Hibbard & Buhrmester, 2010). Competitive individuals tend to be regarded as intense, impatient, and perfectionistic (Matthews & Angulo, 1980; Ommundsen et al., 2005). Such traits may impede relationship development in youth. Comparing this finding to broader research is challenging due to the fact that there has been little research examining the links between competitiveness and peer rejection. Competitiveness has been associated with extraversion and self-esteem (Bing, 1999). Thus, competitive youth may perceive that they are respected and liked by peers, which may not be consistent with opinions of the peer group. As the current study measured peer rejection using self-reports, competitive youth may not have been aware of being disliked by

peers or overestimated their popularity. It may also be that competitive youth are not respected by the peer group, as they perceive it, but feared and therefore not challenged or outwardly disliked (Vaillancourt, McDougall, Hymel, & Sunderani, 2010).

Competitiveness and peer rejection were related within time in grade 7, though negatively. Thus, there may be other factors influencing this association. One possible factor influencing the link between competitiveness and peer rejection may be dominance. That is, it may be dominance, not competitiveness that is linked to higher levels of peer rejection. Research by Hawley, Little, and Card (2008) has shown that dominant individuals attempt to balance pro-social behaviour with forceful, or aggressive behaviour to keep positive relations with others. Although some dominant youth may be able to successfully balance this behaviour and maintain relationships, some may not and could become rejected by peers. Moreover, competitiveness that lacks aggressive motivation, when balanced with compassion, does not necessarily result in poor peer relations (Hawley et al., 2008).

Results of the indirect analysis indicated that the sequence of grade 7 aggression to grade 8 rejection to grade 9 aggression was not significant. In the current study, competitiveness seemed to initiate the cascade, yet the association between aggression and peer rejection was inconsistent. At grade 9, peer rejection negatively predicted competitiveness at grade 10. It was also found that grade 11 competitiveness negatively predicted grade 12 rejection. While these results are contrary to our predictions, the results may shed light on competitive individuals who are perceived by peers as successful, whether it be in sports, academics, etc. Though the current study examined the negative aspects of competitiveness, there are possible benefits of competitiveness (Hibbard & Buhrmester, 2010; Newby & Klein, 2014; Ommundsen et al., 2005). People are often attracted to or want to associate with ‘winners’ – individuals who excel at something, whether it be academics, athletics, etc. (Fletcher & Nusbaum, 2008). Competitive individuals tend to do well and succeed. They may be more likely to be accepted by peers, in some part, due to their success.

Competitiveness is positively related to the extraversion facets of excitement-seeking and assertiveness, yet is negatively associated with the facets of friendliness and cheerfulness (Fletcher & Nusbaum, 2008), the latter of which may be linked more strongly to positive peer relations. Further, trait competitiveness has also been negatively associated with integrity, modesty, candour, and sympathy (Fletcher & Nusbaum, 2008). Should competitive youth lack

such pro-social skills and traits, establishing and maintaining positive relationships with peers would prove difficult. These conflicting results are intriguing and illustrate that trait competitiveness is complex and deserves further examination in future research. It may be useful to examine both the positive and negative aspects of competitiveness in future research, as the trait could impact youths' behaviour, perception, and relationships.

Aggression and Peer Rejection

Aggression and peer rejection were associated at every time point in the assessment period. Research has shown that youth who behave aggressively are more likely to encounter peer issues, such as rejection (Archer & Coyne, 2005; Dijkstra et al., 2008; Dodge et al., 1982; Fite et al., 2013). However, it may be that rejected youth tend to use more aggression (Dodge et al., 1990; Hubbard, 2001; Reijntjes et al., 2011; Werner & Crick, 2004).

The literature is mixed regarding predictions between aggression and peer rejection. Some results demonstrate aggression predicts peer rejection (Archer & Coyne, 2005; Bernard, 2013; Coie et al., 1995). This may occur as youth gain an aggressive reputation that discourages peers from socializing with them (Crowley, 2001). Other researchers have found the opposite (Crick & Dodge, 1994; Dodge et al., 2003; Reijntjes et al., 2011; Werner & Crick, 2004). Peer rejection may cause youth to aggress, resulting in further exclusion (Dodge et al., 2003; Reijntjes et al., 2011; Werner & Crick, 2004). Still other findings illustrate that predictions occur in both directions (Bowker & Etkin, 2014). The mixed results within the literature indicate a complex and intricate association.

Sex Differences

There were several associations that differed between boys and girls. From grade 7 to grade 8, both the competitiveness to aggression path and the aggression to competitiveness path were significant for girls, and not boys, indicating that predictive links were occurring for girls and not for boys. Placing these results into the broader literature is difficult as there have been no *longitudinal* studies to our knowledge that have examined competitiveness and aggression across sex. Boys did rate significantly higher on aggression from grades 7 to 8, consistent with literature that boys are more aggressive than girls. Girls rated significantly higher than boys on both peer rejection from 8 to 9 and on competitiveness from grade 10 to 11. However, the competitiveness finding appears to be novel. Cross-sectionally, boys and men have been shown to rate higher on both competitiveness and aggression than girls and women (Archer & Webb, 2006; Card et al.,

2008; Coyne et al., 2008; Green & Rechis, 2006; Hibbard & Buhrmester, 2010; Martinho et al., 2015; Terrell et al., 2008). The contradiction with the literature may be the result of our composite of aggression. Future studies should examine competitiveness across sex as well as different forms and functions of aggression. Our results should also be replicated and expanded to confirm or contrast the findings across sex, as the associations appear to be complex.

Contrary to previous studies that boys are more likely to be rejected by peers (Coie et al., 1990), results indicated that girls reported higher levels of peer rejection than boys. Girls tend to value close friendships and are more likely to be negatively impacted by the deterioration of these friendships than boys are (Coyne et al., 2006; Coyne et al., 2008; Rulison, Gest, Loken, & Welsh, 2010). Thus girls may be more vulnerable to and aware of peer rejection than boys. Further, self-report measures of peer rejection were used in the current study. However, the majority of studies assessing rejection have relied on reports completed by peers. Peer reports of rejection may yield different results across sex. Specifically, Hymel, Bowker, and Woody (1993) found that rejected youth who were also aggressive were shown to overestimate their behavioural competence, while non-aggressive and non-rejected youth were more likely to report accurate interpretations of their behaviour. Yet, social competence tends to be overestimated by both groups in relation to peer reports (Hymel et al., 1993). This has been found especially for boys. Rejected boys have been shown to be less able to correctly assess how much peers disliked them, and aggressive-rejected boys have been shown to be much less likely to assess how disliked they were compared to those who were not aggressive or rejected (Mayeux, 2008; Zakriski & Coie, 1996). Boys may perceive themselves more positively than girls, which may be why our results indicated that girls had higher ratings of *perceived* peer rejection. It is possible that the peer group could hold a different opinion than the perceptions that youth have.

Limitations and Future Directions

Although this study has several notable strengths, such as a longitudinal dataset where participants were examined yearly over 6 time points, and a model that builds on previous research for competitiveness, aggression, and peer rejection, there are still some limitations that should be considered. First, self-report measures were used to collect the data, which may have resulted in some social desirability bias from participants. Second, the participants are from one region of southern Ontario, which may hinder the possibility of generalizing the results. Third, to access the data longitudinally, Times 1 and 2 were not useable as competitiveness was not

measured at this time. However, there were still 6 time points used in the present study. Fourth, by grade 12, some of the participants who rated higher on aggression at the beginning of the study had dropped out. This may be why the path from grade 11 competitiveness to grade 12 aggression was not significant, as some youth who were more aggressive did not participate in the final year. Fifth, the effect sizes of the within-time associations between competitiveness and aggression were small. These findings may only have been statistically significant because of the large sample size of the study. Sixth, there has been shown to be disagreement regarding a precise definition for competitiveness (Green & Rechis, 2006; Newby & Klein, 2014). This may be problematic, as it is crucial to have a practical and definite definition to study competitiveness (Sambolec, Kerr, & Messé, 2007). A lack of a proper definition could influence how researchers assess the construct and conduct their examinations, resulting in divergent findings in the broader literature.

Finally, a composite was made for aggression combining various forms of aggression. Future studies could examine these forms separately. Two that could potentially be of interest to expand the current study are: overt aggression, including physical aggression such as pushing, hitting, and kicking others, as well as verbal aggression such as insults and threats; and covert aggression such as relational aggression, which includes spiteful manipulation of relationships as well as deteriorating a target's social standing, among other behaviour (Card et al., 2008). Relational forms of aggression use manipulation and secretive methods to harm targets, especially regarding their relationships and other aspects of social interaction (Archer & Coyne, 2005; Card et al., 2008; Coyne et al., 2006; Lagerspetz, Björkqvist, & Peltonen, 1988). Competitiveness may predict overt and relational aggression differently. For instance, there could be differences favouring boys demonstrating more aggression and, in particular, more physical aggression, while girls may use more relational aggression, but less aggression in general (Archer & Coyne, 2005; Card et al., 2008; Coyne et al., 2006; Vaillancourt, 2013). This is one of the first studies to globally examine these concepts longitudinally. There is the potential for the concepts to be explored even further through for a more comprehensive understanding of these links and predictions.

Implications

The associations of competitiveness, aggression, and rejection from peers have not been examined thoroughly by researchers, especially over time. There has been little examination of

aggression and competitiveness outside of the contexts of sports and, more recently, video games. The current study is the first to our knowledge to examine trait competitiveness, regardless of context, and its association with aggression and peer rejection, both over time and across sex.

Our findings highlight the importance of examining the influence of underlying issues that may not always be considered by parents, teachers, and clinicians. These are problems that should be addressed. It may not always be aggressive behaviour that is the issue. High competitiveness may be the underlying problem that should be the focus in order to curb aggressive behaviour, which can be detrimental to both perpetrators and victims of aggression. Thus, if parents, teachers, coaches, or counsellors recognized that aggressive behaviour might be the manifestation of other constructs, such as competitiveness, youth's issues could be addressed using treatments that are more appropriate and fit youth's requirements, especially preventative treatments. Personalized preventions meeting a youth's particular needs could make a critical difference regarding the success of his or her outcomes. Screening for and addressing the motivations behind competitiveness could prevent the manifestation of aggression in youth, if competitiveness was identified and treated before aggressive behaviour was expressed.

Further, this could lead to the potential to create and implement programs for children at an early stage of their lives that would explore how to express their competitiveness in healthier and more pro-social ways than behaviour such as aggression. For instance, if competitive youth could focus on the potential to personally excel when faced with a challenge, rather than competing to be superior to others, they could be more likely to experience the benefits associated with competitiveness. Another possibility would be to advise and educate youth to develop the skills that they might lack necessary to build relationships with others, such as sympathy, sincerity, and friendliness.

This research could provide parents, teachers, coaches, and counsellors with the opportunity to identify children and youth that are at risk for aggressive behaviour and potentially prevent its expression by treating competitive behaviour at the source. This may help to prevent or attenuate some of the negative psychological symptoms associated with both aggression and subsequent peer rejection.

Conclusions

Competitiveness is a salient personality trait and a positive predictor of aggression. The link between competitiveness and peer rejection is unclear. Aggression and peer rejection have been associated with childhood maladjustment (Bowker & Etkin, 2014; Crick et al., 2006). Thus, it is important to study factors that could influence these trends, such as competitiveness. Although it has not often been studied outside of a particular context, competitiveness has been shown to have an impact on youths' behaviour and perceptions. The current study is the first to our knowledge to examine these constructs longitudinally. It represents a significant advancement in our understanding of these constructs. Future research should examine trait competitiveness as well as potential benefits in order to gain a better understanding of the influence of competitiveness on developing youth.

References

- Adachi, P. J., & Willoughby, T. (2013). The longitudinal link between competitive video games, competitive gambling, and aggression. *Journal of Youth and Adolescence, 42*, 1090-1104. doi: 10.1007/s10964-013-9952-2
- Adachi, P. J., & Willoughby, T. (2011). The effect of violent video games on aggression: Is it more than just the violence? *Aggression and Violent Behavior, 16*, 55-62. doi:10.1016/j.avb.2010.12.002
- Anderson, C. A., & Carnagey, N. L. (2009). Causal effects of violent sports video games on aggression: Is it competitiveness or violent content? *Journal of Experimental Social Psychology, 45*, 731-739. doi:10.1016/j.jesp.2009.04.019
- Arbuckle, J. L. (2014). Amos (Version 23.0) [Computer Program]. Chicago: IBM SPSS
- Archer, J., & Coyne, S. M. (2005). An integrated review of indirect, relational, and social aggression. *Personality and Social Psychology Review, 9*, 212-230.
- Archer, J. & Webb, I. A. (2006). The relation between scores on the Buss-Perry Aggression Questionnaire and aggressive acts, impulsiveness, competitiveness, dominance, and sexual jealousy. *Aggressive Behavior, 32*, 464-473. doi:10.1002/ab.20146
- Baumeister, R. F. & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497-529.
- Bergman, L. R. & Magnusson, D. (1986). Type A behavior: A longitudinal study from childhood to adulthood. *Psychosomatic Medicine, 48*, 134-142.
- Bernard, S. (2013). Reputation systems, aggression, and deterrence in social interaction. *Social Science Research, 42*, 230-245. doi:10.1016/j.ssresearch.2012.09.004
- Bing, M. N. (1999). Hypercompetitiveness in academia: Achieving criterion-related validity from item context specificity. *Journal of Personality Assessment, 73*, 80-99.
- Bolger, K. E. & Patterson, C. J. (2001). Developmental pathways from child maltreatment to peer rejection. *Child Development, 72*, 549-568. doi:10.1111/1467-8624.00296
- Bowker, J. C. & Etkin, R. G. (2014). Mixed-grade rejection and its association with overt aggression, relational aggression, anxious-withdrawal, and psychological maladjustment. *The Journal of Genetic Psychology, 175*, 35-50. doi:10.1080/00221325.2013.799060

- Brown, S. P., Cron, W. L., & Slocum Jr., J. W. (1998). Effects of trait competitiveness and perceived intraorganizational competition on salesperson goal setting and performance. *Journal of Marketing*, *62*, 88-98.
- Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods & Research*, *21*(2), 230-258.
- Buhs, E. S., Ladd, G. W., & Herald, S. L. (2006). Peer exclusion and victimization: Processes that mediate the relation between peer group rejection and children's classroom engagement and achievement? *Journal of Educational Psychology*, *98*, 1-13. doi: 10.1037/0022-0663.98.1.1
- Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development*, *79*, 1185-1229.
- Cleverley, K., Szatmari, P., Vaillancourt, T., Boyle, M., & Lipman, E. (2012). Developmental trajectories of physical and indirect aggression from late childhood to adolescence: Sex differences and outcomes in emerging adulthood. *Journal of the American Academy of Child & Adolescent Psychiatry*, *51*, 1037-1051. doi:10.1016/j.jaac.2012.07.010
- Coie, J. D., Dodge, K. A., & Coppotelli, H. (1982). Dimensions and types of social status: A cross-age perspective. *Developmental Psychology*, *18*, 557-570.
- Coie, J. D., Dodge, K. A., & Kupersmidt, J. B. (1990). Peer group behavior and social status. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 17-59). New York: Cambridge.
- Coie, J., Terry, R., Lenox, K., Lochman, J., & Hyman, C. (1995). Childhood peer rejection and aggression as predictors of stable patterns of adolescent disorder. *Development and Psychopathology*, *7*, 697-713.
- Collier, S. A., Ryckman, R. M., Thornton, B., & Gold, J. A. (2010). Competitive personality attitudes and forgiveness of others. *Journal of Psychology*, *144*, 535-543.
- Côté, S., Vaillancourt, T., LeBlanc, J. C., Nagin, D. S., & Tremblay, R. E. (2006). The development of physical aggression from toddlerhood to pre-adolescence: A nation wide longitudinal study of canadian children. *Journal of Abnormal Child Psychology*, *34*, 68-82. doi:10.1007/s10802-005-9001-z

- Coyne, S. M., Archer, J., Eslea, M. (2006). "We're not friends anymore! Unless...": The frequency and harmfulness of indirect, relational, and social aggression. *Aggressive Behaviour, 32*, 294-307. doi: 10.1002/ab.20126
- Coyne, S. M., Archer, J., Elsea, M., & Liechty, T. (2008). Adolescent perceptions of indirect forms of relational aggression: Sex of perpetrator effects. *Aggressive Behavior, 34*, 577-583. doi:10.1002/ab.20266
- Crick, N. R. & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*, 74-101. doi:10.1037/0033-2909.115.1.74
- Crick, N. R., Ostrov, J. M., & Werner, N. E. (2006). A longitudinal study of relational aggression, physical aggression, and children's social-psychological adjustment. *Journal of Abnormal Psychology, 34*, 131-142. doi:10.1007/s10802-005-9009-4
- Crowley, P. H. (2001). Dangerous games and the emergence of social structure: Evolving memory-based strategies for the generalized hawk-dove game. *Behavioral Ecology, 12*, 753-760.
- Davidson, A. J., Walton, M. D., Cohen, R. (2013). Patterns of conflict experiences that emerge in peer reports and personal narratives during middle childhood. *Applied Developmental Science, 17*, 109-122. doi:10.1080/10888691.2013.804374
- Dijkstra, J. K., Lindenberg, S., & Veenstra, R. (2007). Same-gender and cross-gender peer acceptance and peer rejection and their relation to bullying and helping among preadolescents: Comparing predictions from gender-homophily and goal-framing approaches. *Developmental Psychology, 43*, 1377-1389. doi:10.1037/0012-1649.43.6.1377
- Dijkstra, J. K., Lindenberg, S., & Veenstra, R. (2008). Beyond the class norm: Bullying behavior of popular adolescents and its relation to peer acceptance and rejection. *Journal of Abnormal Child Psychology, 36*, 1289-1299. doi:10.1007/s10802-008-9251-7
- Dodge, K. A., Bates, J. E., & Pettit, G. S. (1990). Mechanisms in the cycle of violence. *Science, 250*, 1678-1683.
- Dodge, K. A., Coie, J. D., & Brakke, N. P. (1982). Behavior patterns of socially rejected and neglected preadolescents: The roles of social approach and aggression. *Journal of Abnormal Psychology, 10*, 389-409. doi:10.1007/BF00912329

- Dodge, K. A., Coie, J. D., & Lynam, D. (2006). Aggression and antisocial behaviour in youth. In W. Damon, & R. M. Lerner (Chief Eds.), Eisenberg, N. (Vol. Ed.), *Handbook of Child Psychology: Vol. 3. Social, emotional, and personality development* (6th ed., pp.719-788). Hoboken, New Jersey: John Wiley & Sons, Inc.
- Dodge, K. A., Lansford, J. E., Burks, V. S., Bates, J. E., Pettit, G. S., ... Price, J. M. (2003). Peer rejection and social information-processing factors in the development of aggressive behavior problems in children. *Child Development, 74*, 374-393.
- Fite, P. J., Hendrickson, M., Rubens, S. L., Gabrielli, J., & Evans, S. (2013). The role of peer rejection in the link between reactive aggression and academic performance. *Child Youth Care Forum, 42*, 193-205. doi:10.1007/s10566-013-9199-9
- Fletcher, T. D. & Nusbaum, D. N. (2008). Trait competitiveness as a composite variable: Linkages with facets of the big-five. *Personality and Individual Differences, 45*, 312-317. doi:10.1016/j.paid.2008.04.020
- Gelb, R. & Jacobson, J. L. (1988). Popular and unpopular children's interactions during cooperative and competitive peer group activities. *Journal of Abnormal Child Psychology, 16*, 247-261.
- Gill, D. L. (1986). Competitiveness among females and males in physical activity classes. *Sex Roles, 15*, 233-247.
- Gomez, R. (1998). Impatience-aggression, competitiveness and avoidant coping: Direct and moderating effects on maladjustment among adolescents. *Personality and Individual Differences, 25*, 649-661.
- Green, V. A., & Rechis, R. (2006). Children's cooperative and competitive interactions in limited resource situations: A literature review. *Applied Developmental Psychology, 27*, 42-59.
- Hawley, P. H., Little, T. D., & Card, N. A. (2008). The myth of the alpha male: A new look at dominance-related beliefs and behaviors among adolescent males and females. *International Journal of Behavioral Development, 32*, 76-88. doi:10.1177/0165025407084054
- Hibbard, D. R., & Buhrmester, D. (2010). Competitiveness, gender, and adjustment among adolescents. *Sex Roles, 63*, 412-424.
- Horn, S. S. (2013). Adolescents' reasoning about exclusion from social groups. *Developmental Psychology, 39*, 71-84. doi:10.1037/0012-1649.39.1.71

- Houston, J. M., Harris, P. B., Howansky, K., & Houston, S. M. (2015). Winning at work: Trait competitiveness, personality types, and occupational interests. *Personality and Individual Differences, 76*, 49-51. doi:10.1016/j.paid.2014.11.046
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*, 1–55. doi:10.1080/10705519909540118.
- Hyde, J. S. (2014). Gender similarities and differences. *Annual Review of Psychology, 65*, 373-398. doi: 10.1146/annurev-psych-010213-115057
- Hymel, S., Bowker, A., & Woody, E. (1993). Aggressive versus withdrawn unpopular children: Variations in peer and self-perceptions in multiple domains. *Child Development, 64*, 879-896.
- Jiang, W., Huang, Y., & Chen, G. (2012). How cooperativeness and competitiveness influence student burnout: The moderating effect of neuroticism. *Social Behavior and Personality, 40*, 805-814.
- Johnson & Diekmann. (2015). Pursuing desires rather than duties? The motivational content of gender stereotypes. *Sex Roles, 73*, 16-28. doi:10.1007/s11199-015-0494-9
- Johnstone, R. A., & Bshary, R. (2004). Evolution of spite through indirect reciprocity. *Proceedings of the Royal Society of London, 271*, 1917-1922. doi:10.1098/rspb.2003.2581
- Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York: The Guilford.
- Lagerspetz, K. M. J., Björkqvist, K., Peltonen, T. (1988). Is indirect aggression typical of females? Gender differences in aggressiveness in 11- to 12-year old children. *Aggressive Behavior 14*, 403-414.
- Lam, L. W. (2012). Impact of competitiveness on salespeople's commitment and performance. *Journal of Business Research, 65*, 1328-1334. doi:10.1016/j.jbusres.2011.10.026
- Lee, E. (2009). The relationship of aggression and bullying to social preference: Differences in gender and types of aggression. *International Journal of Behavioral Development, 33*(4), 323-330. doi:10.1177/0165025408098028
- Little, R. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*, 1198-1202.

- Little, T. D., Henrich, C. C., Jones, S. M., & Hawley, P. H. (2003). Disentangling the “whys” from the “whats” of aggressive behaviour. *International Journal of Behavioural Development, 27*, 122-133.
- Martinho, M., Albergaria-Almeida, P., & Dias, J. T. (2015). Cooperation and competitiveness in higher education science: Does gender matter? *Procedia Social and Behavioural Sciences, 191*, 554-558. doi: 10.1016/j.sbspro.2015.04.569
- Matthews, K. A., & Angulo, J. (1980). Measurement of Type A behavior pattern in children: Assessment of children’s competitiveness, impatience-anger, and aggression. *Child Development, 51*, 466-475.
- Matthews, K. A., & Avis, N. E. (1983). Stability of overt Type A behaviors in children: Results from a one-year longitudinal study. *Child Development, 54*, 1507-1512.
- McDougall, P., Hymel, S., Vaillancourt, T., & Mercer, L. (2001). The consequences of childhood rejection. In M. R. Leary (Ed.), *Interpersonal rejection* (pp. 213–247). New York, NY: Oxford University Press.
- McEachern, A., & Snyder, J. (2012). Gender differences in predicting antisocial behaviors: Developmental consequences of physical and relational aggression. *Journal of Abnormal Child Psychology, 40*, 501-512. doi:10.1007/s10802-011-9589-0
- Mowen, J. C. (2004). Exploring the trait of competitiveness and its consumer behavior consequences. *Journal of Consumer Psychology, 14*, 52-63.
- Muthén, L. K., & Muthén, B. (2011). Mplus 6.12 for Windows. Los Angeles: Author
- Mayeux, L. (2008). It’s not just being popular, it’s knowing it, too: The role of self-perceptions of status in the associations between peer status and aggression. *Social Development, 17*, 871-888. doi:10.1111/j.1467-9507.2008.00474.x
- Newby, J. L. & Klein, R. G. (2014). Competitiveness reconceptualised: Psychometric development of the competitiveness orientation measure as a unified measure of trait competitiveness. *The Psychological Record, 64*, 879-895. doi:10.1007/s40732-014-0083-2
- Ommundsen, Y., Roberts, G. C., Lemyre, P., & Miller, B., W. (2005). Peer relationships in adolescent competitive soccer: Associations to perceived motivational climate, achievement goals and perfectionism. *Journal of Sports Sciences, 23*, 977-989.

- Prinstein, M. J. & La Greca, A. M. (2004). Childhood peer rejection and aggression as predictors of adolescent girls' externalizing and health risk behaviours: A 6-year longitudinal study. *Journal of Consulting and Clinical Psychology, 72*, 103-112. doi:10.1037/0022-006X.72.1.103
- Reijntjes, A., Thomaes, S., Kamphuis, J. H., Bushman, B. J., Orobio de Castro, B., & Telch, M. J. (2011). Explaining the paradoxical rejection-aggression link: The mediating effects of hostile intent attributions, anger, and decreases in state self-esteem on peer rejection-induced aggression in youth. *Personality and Social Psychology Bulletin, 37*, 955-963. doi:10.1177/0146167211410247
- Reingle, J. M., Maldonado-Molina, M. M., Jennings, W. G., & Komro, K. A. (2012). Racial/ethnic differences in trajectories of aggression in a longitudinal sample of high-risk, urban youth. *Journal of Adolescent Health, 51*, 45-52. doi:10.1016/j.jadohealth.2011.11.008
- Richardson, C. B., Hitti, A., Mulvey, K. L., & Killen, M. (2014). Social exclusion: The interplay of group goals and individuals characteristics. *Journal of Youth and Adolescence, 43*, 1281-1294. doi:10.1007/s10964-013-9967-8
- Roseth, C. J., Johnson, D. W., & Johnson, R. T. (2008). Promoting early adolescents' achievement and peer relationships: The effects of cooperative, competitive, and individualistic goal structures. *Psychological Bulletin, 134*, 223-246. doi:10.1037/0033-2909.134.2.223
- Ross, S. R., Rausch, M. K., & Canada, K. E. (2003). Competition and cooperation in the Five-Factor Model: Individual differences in achievement orientation. *The Journal of Psychology, 137*, 323-337.
- Rulison, K. L., Gest, S. D., Loken, E., & Welsh, J. A. (2010). Rejection, feeling bad, and being hurt: Using multilevel modeling to clarify the link between peer group aggression and adjustment. *Journal of Adolescence, 33*, 787-800. doi:10.1016/j.adolescence.2010.07.005
- Ryckman, R. M., Libby, C. R., van den Borne, B., Gold, J. A., & Lindner, M. A. (1997). Values of hypercompetitiveness and personal development competitive individuals. *Journal of Personality Assessment, 69*, 271-283.

- Sambolec, E. J., Kerr, N. L., & Messé, L. A. (2007). The role of competitiveness at social tasks: Can indirect cues enhance performance? *Journal of Applied Sport Psychology, 19*, 160-172. doi:10.1080/10413200601185164
- Smither, R. D. & Houston, J. M. (1992). The nature of competitiveness: The development and validation of the Competitiveness Index. *Educational and Psychological Measurement, 52*, 407-418.
- Spence, J. T., & Helmreich, R. L. (1983). Achievement-related motives and behavior. In J. T. Spence (Ed.), *Achievement and achievement motives: Psychological and sociological approaches* (pp. 7-74). San Francisco: Freeman
- Steinberg, L. (1986). Stability (and instability) of Type A behavior from childhood to young adulthood. *Developmental Psychology, 22*, 393-402. doi:10.1037/0012-1649.22.3.393
- Terrell, H. K., Hill, E. D., & Nagoshi, C. T. (2008). Gender differences in aggression: The role of status and personality in competitive interactions. *Sex Roles, 59*, 814-826. doi: 10.1007/s11199-008-9486-3
- Tremblay, R. E. (2000). The development of aggressive behaviour during childhood: What have we learned in the past century? *International Journal of Behavioral Development, 24*(2), 129-141. doi:10.1080/016502500383232
- Vaillancourt, T. (2005). Indirect aggression among humans: Social construct or evolutionary adaptation. *Developmental Origins of Aggression, 158-177*.
- Vaillancourt, T. (2013). Do human females use indirect aggression as an intrasexual competition strategy? *Philosophical Transactions of the Royal Society, B: Biological Sciences, 368*, 20130080.
- Vaillancourt, T. (in press). Indirect aggression and social aggression. In M.H. Bornstein, M.E. Arterberry, K.L. Fingerman, & J.E. Lansford (Eds.), *The SAGE Encyclopedia of Lifespan Human Development*. Sage Publications.
- Vaillancourt, T., Brittain, H. L., McDougall, P., & Duku, E. (2013). Longitudinal links between childhood peer victimization, internalizing and externalizing problems, and academic functioning: Developmental cascades. *Journal of abnormal child psychology, 41*, 1203-1215.
- Vaillancourt, T. & Hymel, S. (2006). Aggression and social status: The moderating roles of sex and peer-valued characteristics. *Aggression Behavior, 32*, 396-408. doi:10.1002/ab.2013

- Vaillancourt, T., McDougall, P., Hymel, S., Krygsman, A., Miller, J., Stiver, K., & Davis, C. (2008). Bullying: Are researchers and children/youth talking about the same thing? *International Journal of Behavioral Development* 32, 486-495. doi: 10.1177/0165025408095553
- Vaillancourt, T., McDougall, P., Hymel, S., & Sunderani, S. (2010). Respect or fear? The relationship between power and bullying behavior. In S. R. Jimerson, S. M. Swearer, & D. L. Espelage (Eds.), *Handbook of bullying in schools: An international perspective* (pp. 211–222). New York, NY: Routledge.
- Vaillancourt, T., Trinh, V., McDougall, P., Duku, E., Cunningham, L., Cunningham, C, ... Short, K. (2010). Optimizing population screening of bullying in school-aged children. *Journal of School Violence*, 9, 233-250. doi:10.1080/15388220.2010.483182
- Wahl, K., & Metzner, C. (2012). Parental influences on the prevalence and development of child aggressiveness. *Journal of Child and Family Studies*, 21(2), 344-355.
doi:10.1007/s10826-011-9484-x
- Wang, J., McDonald, K. L., Rubin, K. H., & Laursen, B. (2012). Peer rejection as a social antecedent to rejection sensitivity in youth: The role of relational valuation. *Personality and Individual Differences*, 53, 939-942. doi:10.1016/j.paid.2012.07.007
- Wang, Y., Yuan, B., Roberts, K., Wang, Y., Lin, C., Simons, R. F. (2014). How friendly is a little competition? Evidence of self-interest and empathy during outcome evaluation. *International Journal of Psychophysiology*, 91, 155-162.
doi:10.1016/j.ijpsycho.2013.10.009
- Werner, N. E., & Crick, N. R. (2004). Maladaptive peer relationships and the development of relational and physical aggression during middle childhood. *Social Development*, 13, 495-514. doi:10.1111/j.1467-9507.2004.00280.x
- White, B. A. & Kistner, J. A. (2011). Biased self-perceptions, peer rejection, and aggression in children. *Journal of Abnormal Psychology*, 39, 645-656. doi:10.1007/s10802-011-9506-6
- Zakriski, A. L., & Coie, J. D. (1996). A comparison of aggressive-rejected and nonaggressive-rejected children's interpretations of self-directed and other-directed rejection. *Child Development*, 67, 1048–1070.

Table 1. Means, standard deviations, and sex difference tests.

		Mean	Std. Deviation	t	Sig.	Mean	Std. Deviation
Competitiveness							
Grade 7				4.10	.000	2.24	1.03
	Boys	2.44	0.98				
	Girls	2.08	1.05				
Grade 8				3.68	.000	2.29	1.07
	Boys	2.49	0.98				
	Girls	2.14	1.11				
Grade 9				2.83	.005	2.39	1.08
	Boys	2.26	1.11				
	Girls	2.54	1.01				
Grade 10				3.27	.001	2.42	1.11
	Boys	2.61	1.04				
	Girls	2.27	1.14				
Grade 11				3.59	.000	2.41	1.04
	Boys	2.61	0.91				
	Girls	2.26	1.10				
Grade 12				4.10	.000	2.36	1.04
	Boys	2.59	0.98				
	Girls	2.19	1.05				
Aggression							
Grade 7				1.46	.014	0.36	0.32
	Boys	0.39	0.33				
	Girls	0.35	0.31				
Grade 8				1.93	.054	0.35	0.33
	Boys	0.38	0.35				
	Girls	0.32	0.32				
Grade 9				-0.07	.948	0.34	0.32
	Boys	0.34	0.31				
	Girls	0.33	0.32				
Grade 10				0.72	.470	0.33	0.33

	Boys	0.35	0.33				
	Girls	0.32	0.33				
Grade 11				-0.14	.892	0.31	0.33
	Boys	0.31	0.32				
	Girls	0.31	0.34				
Grade 12				-0.82	.414	0.31	0.33
	Boys	0.30	0.34				
	Girls	0.32	0.32				
Peer rejection							
Grade 7				-2.97	.003	0.87	1.66
	Boys	0.64	1.31				
	Girls	1.06	1.89				
Grade 8				-1.89	.060	0.89	1.71
	Boys	0.73	1.59				
	Girls	1.01	1.79				
Grade 9				-3.35	.001	0.83	1.62
	Boys	0.56	1.11				
	Girls	1.05	1.92				
Grade 10				-4.76	.000	0.97	1.81
	Boys	0.53	1.01				
	Girls	1.33	2.19				
Grade 11				-4.59	.000	1.00	1.82
	Boys	0.56	1.17				
	Girls	1.35	2.14				
Grade 12				-2.65	.008	0.97	1.59
	Boys	0.75	1.42				
	Girls	1.15	1.70				

Table 2. Bivariate correlations of study variables.

	T3 COMP	T4 COMP	T5 COMP	T6 COMP	T7 COMP	T8 COMP	T3 AGG	T4 AGG	T5 AGG	T6 AGG	T7 AGG	T8 AGG	T3 REJ	T4 REJ	T5 REJ	T6 REJ	T7 REJ
T4 COMP	.74																
T5 COMP	.64	.75															
T6 COMP	.63	.71	.78														
T7 COMP	.54	.62	.71	.78													
T8 COMP	.50	.57	.62	.74	.78												
T3 AGG	.22	.13	.10	.09	.14	.12											
T4 AGG	.23	.21	.20	.12	.12	.13	.69										
T5 AGG	.24	.19	.21	.15	.17	.10	.57	.62									
T6 AGG	.19	.16	.20	.19	.17	.16	.44	.48	.64								
T7 AGG	.17	.09	.20	.20	.23	.16	.43	.50	.66	.73							
T8 AGG	.06	.03	.13	.09	.16	.17	.36	.44	.57	.68	.74						
T3 REJ	-.10	-.06	-.05	-.10	-.10	-.11	.24	.15	.14	.12	.09	.11					
T4 REJ	-.13	-.07	-.05	-.09	-.14	-.09	.21	.26	.23	.20	.20	.14	.52				
T5 REJ	-.11	-.06	-.06	-.11	-.08	-.10	.19	.15	.28	.20	.18	.21	.34	.51			
T6 REJ	-.07	-.03	-.05	-.05	-.06	-.06	.15	.20	.21	.29	.22	.24	.23	.32	.53		
T7 REJ	-.09	-.11	-.08	-.07	-.10	-.08	.07	.14	.18	.18	.25	.21	.27	.36	.46	.61	
T8 REJ	-.12	-.09	-.09	-.11	-.10	-.07	.07	.14	.25	.29	.30	.34	.20	.25	.30	.40	.53

Note. Correlations in bold are significant at $p < 0.05$

Figure 1: Path model of competitiveness, aggression, and peer rejection in youth. Ethnicity and parent income were controlled for. Values displayed are standardized coefficients and are significantly significant at $p < 0.05$. Non-significant values are not shown but remain in the model.

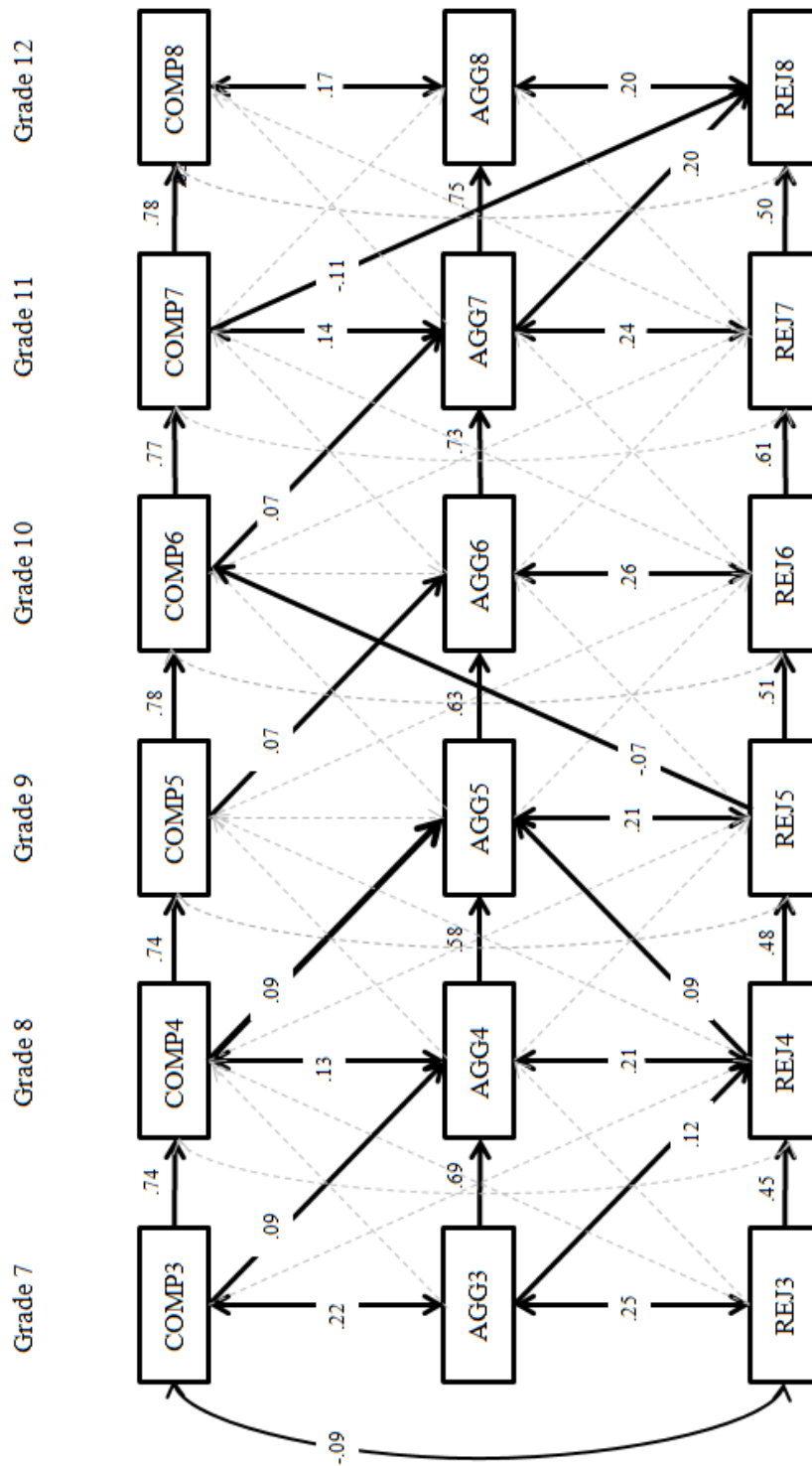


Figure 2: Path model of competitiveness, aggression, and peer rejection in youth across sex.

Ethnicity and parent income were controlled for. Results are displayed as boy/girl. Values displayed are standardized coefficients and are significantly significant at $p < 0.05$. Non-significant values are not shown but remain in the model.

