THE DIRECT AND MODERATING EFFECT OF BULLYING ON ADOLESCENT HEALTH

By

Leila A. Rahey

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Queen’s University
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Abstract

In the last two decades, research has established a negative association between involvement in bullying and emotional health difficulties. Few studies, in comparison, explore the relationship between bullying and victimization and physical health. Moreover, studies are lacking on the influence of bullying on health in adolescence. Three studies were conducted to explore the association between bullying and adolescent positive and negative health behaviours. Using an ecological model, we examined the influence of bullying and victimization on physical activity and health status, risky sexual behaviours and sexual coercion, and dating violence perpetration and victimization. Each study explored how bullying influenced the relationship between environmental factors and adolescent health. Results suggest that both bullying and victimization can have a negative influence on risky health behaviours. As well, the findings suggest that relationships with adults may protect youth involved in bullying from negative health experiences. These results support a model of co-occurring health behaviours in youth, including involvement in bullying. Hence, we propose that teen health promotion programs target overall lifestyle choices rather than solely focusing on individual health behaviours. As well, we recommend that bullying prevention programs need to address engagement in unhealthy habits during adolescence, while being sensitive to the complex relationship between environmental and bullying factors that can influence physical health in adolescence.
Co Authorship

I assumed primary responsibility for the conceptualization and analysis of the research described in this thesis. My supervisor, Dr. Wendy Craig, assisted in all aspects of the research and in the preparation of the manuscripts: she is co-author on all three manuscripts. Dr. Lee Fabrigar was a committee member who provided considerable statistical and conceptual assistance; he appears as a co-author on all three manuscripts. As each study included secondary analysis of data, each study includes the primary researchers for each study as co-authors. For Study 1, the principal investigator for the Canadian records of the Health Behaviour in School-Aged Children Survey (HBSC), Dr. William Boyce, is included as a co-author. In Study 2, one of the investigators for the Canadian Youth, Sexual Health and HIV/AIDS Study (CYSHHAS), Dr.’s William Boyce, is included as a co-author. (2002). And in Study 3, the principal investigators for the Teen Dating Violence and Media study, Drs. Wendy Craig, Jennifer Connolly, and Debra Pepler, are included as co-authors.
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In keeping with one of the central themes in my dissertation – a focus on social environment and key relationships – I would like to acknowledge the important people in my social ecology.

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Chapter 1:

General Introduction
General Introduction

Adolescence is a critical period for the development and consolidation of important health behaviours (Williams, Holmbeck & Neff Greenley, 2002). Behaviours beginning in youth (e.g., substance use, dieting) can have consequences that extend across the lifespan (Johnson, 2002). Adolescence is also a time of transition, including a shift in focus from parent to peer relationships (Pellegrini, 2002). Due to the salience of peer relationships during this developmental period, many health promotion studies focus on the influence of peer behaviours and friendship quality (La Greca, Prinstein, & Fetter, 2001; Lansford, Criss, Pettit, Dodge & Bates, 2003; Wu & Pender, 2002; Feiring, Deblinger Hoch-Espada, & Haworth, 2002; Shope, Trivellore, Raghunathan & Patil, 2003). Examining the effects of bullying and victimization however, is a relatively new area within health psychology research. The following three studies seek to expand on previous research by examining the direct and moderating effect of involvement in bullying on three areas of adolescent health: physical health, sexual health, and dating violence.

Bullying in Adolescence

Bullying is defined as repeated and targeted peer aggression, which can take many forms including physical, verbal, and indirect aggression (Olweus 1994). Although incidence rates vary, many studies indicate that as many as 35% of youth report some degree of involvement in bullying (World Health Organization, 2004; Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001; Olweus, 1994). Furthermore, studies reveal that bullying behaviours peak during early adolescence (Pellegrini, 2002), which coincides, developmentally, with a focus on peer influence and the emergence of
romantic relationships. Experiencing peer difficulties via bullying, consequently, may be particularly problematic during the teen years (Rigby, 1998; Kumpalainen & Rasanen, 2000). Various studies provide support for this hypothesis, as research reveals that involvement in bullying during adolescence can lead to engagement in an array of risky behaviours. These risky behaviours, which include substance use, violence, and suicidality (Connolly, Craig, Goldberg, & Pepler, 2004; Nansel et al., 2001, Olweus, 1994), can lead to increased morbidity and mortality in youth. Therefore, public health researchers are showing increased interest in developing programs to reduce bullying and victimization and its negative correlates.

Despite this increased interest in understanding the connection between involvement in bullying and adolescent health, many domains of health remain unexamined. For instance, although studies reveal that victimized youth may avoid school activities, including physical education classes (Baldry, 2004; Buhs, Ladd, & Herald, 2006, Slee, 1994), few studies examine the relationship between physical activity and involvement in bullying in adolescence. A recent study by Janssen, Craig, Boyce, and Pickett (2004) suggested that there may be a connection between activity level and bullying, as their reports indicated higher rates of obesity in victimized youth. With the growing concern about the rates of obesity and physical inactivity in youth (Centers for Disease Control, 2005; Janssen, Craig, Boyce, & Pickett, 2004), it would seem prudent to examine whether involvement in bullying is associated with a reduction in physical activity. Therefore, Study 1 examines the influence of bullying on physical activity and physical health status in youth.
Along with physical health and activity, sexual relationships and dating violence in youth are receiving increased attention in the media and from public health agencies. While research has not examined sexual behaviours in youth involved in bullying, reports indicate that engagement in violence is a risk factor for involvement in risky sexual behaviours (Prinstein & LaGreca, 2004). As well, a recent study by Connolly et al., (2004) suggests that youth who bully are more likely to engage in dating aggression and advanced dating behaviours during early adolescence. With the high rates of sexually transmitted infections in youth (SIECCAN, 2004) and dating aggression reported by youth (Wolfe, 2006), we sought to expand on previous research by examining the direct and moderating influence of bullying on sexual and dating behaviours in mid adolescence. Thus, Studies 2 and 3 focus on the influence of bullying on risky sexual behaviours and dating violence in mid adolescence.

Theoretical Model

When exploring the connection between involvement in bullying and physical health behaviours it is important to utilize a theoretical model that reflects the diverse influences of both behaviours during adolescence. Bullying and adolescent health research tends to adopt a similar theoretical framework, which incorporates an ecological model of influence. Bullying researchers typically define these ecological models within the context of developmental psychopathology. Developmental psychopathology describes a set of assumptions rather than a specific theoretical model, whereby underlying systemic or environmental factors can influence development in positive or negative ways (Cummings, Davies, & Campbell, 2000). Health researchers, on the other hand, most commonly use Problem Behaviour Theory to describe the web of
environmental factors that can affect health behaviours in adolescence. Problem
Behaviour Theory (PBT) posits that problem behaviours co-occur in adolescence due to
common underlying risk and protective factors within the social ecology of youth (Jessor,
1998). Although each theory has unique aspects, both argue that environmental factors
can directly influence engagement in risky or unhealthy behaviours (Cummings, et al.,
2000; Jessor, 1998). In addition, both theories suggest that these environmental factors
may moderate the influence of one another on health behaviours in youth, indicating that
the influence of one environmental factor (e.g., bullying others) may attenuate or
accentuate the influence of another environmental factor (e.g., connection to school)
(Cummings, Davies, & Campbell, 2000, Jessor, Van Den Bos, Vanderryn, Costa, &
Turbin, 1995).

Given these commonalities across bullying and adolescent health research, the
following three studies use ecological models to investigate the association between
bullying and physical health, sexual health, and dating violence. Each study examines
the direct influence of various environmental factors, including communities, school,
parents, and peers, and the moderating influence of bullying on the relationship between
environmental factors and adolescent health behaviours. By assessing both direct and
moderating models of influence, we hope to shed light on the health risk of youth
involved in bullying, as well as, providing information about the differential
contributions of environmental factors on health depending on the extent of bullying
involvement. As such, each study incorporates ecological models that reflect key
environmental factors (e.g., schools, parents) that can be targeted in health promotion
programs. A general model of the three studies is presented below (See Figure 1).
In the first study, we examined the direct influence of involvement in bullying, school climate, and community climate on physical activity and physical health. Past studies suggest that connection to school and community can have direct effects on physical activity engagement and perception of physical health (Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004; McNeely & Falci, 2004; Rosario, Salzinger, Feldman, & Ng Mak, 2003; Seiffge-Krenke, 1998; Williams, et al., 2002). Youth who feel safe and secure within their school and community are more likely to participate in the activities provided within these environments (Horowitz, McKay, & Marshall, 2005; Seiffge-Krenke, 1998). Conversely, youth who live in unsafe communities, or who feel detached from their school, may experience increased stress, which can negatively affect sense of health and well-being. Based on developmental and Problem Behaviour Theory, we expected that involvement in bullying would offset the positive influence of school and community connection.

Similarly, in Studies 2 and 3, we expected that being involved in bullying would moderate the influence of key environmental factors that affect risky sexual behaviours and dating violence. Previous studies implicate parents and peers as important environmental factors in sexual decision-making and dating violence experiences (French
& Dishion, 2003; Wolfe, 2006). For example, poor parent-child communication and having deviant peers are both risk factors for younger age of risky sexual behaviour and engagement in dating violence (Ream & Savin-Williams, 2005; Werkele & Wolfe, 1999). As well, studies link exposure to harsh discipline with increases in sexual coercion and dating violence experiences in youth (Howard & Wang, 2005; Kaestle & Halpern, 2005; Voisin, 2005; Jackson & Foshee, 1998; Lewis & Fremouw, 2001; Wolfe, 2006). Hence, in both Studies 2 and 3, we examined the moderating influence of bullying and victimization on the relationship between parent and peer factors and adolescent health. Once again, we speculated that involvement in bullying would offset the influence of protective factors (e.g., positive relationships with parents and peers). As well, we expected that being involved in bullying would accentuate the influence of risk factors (e.g., harsh parental discipline and negative peer behaviours).

Advances in Analytic Strategies

Studies 1 and 2 include secondary analysis of large, cross-sectional, health data sets (Boyce, Doherty, Fortin, & MacKinnon, 2002; Currie, Roberts, Morgan, Smith, Setternobulte, Samdal, & Barnekow Rasmussen, 2004). Both Study 1 and 2 also included several variables that assessed environmental and health factors, which allowed for the creation of latent variables to measure environmental and health constructs. Because of the large sample size, we had enough power to analyze the complex models proposed for each study, using structural equation modelling. Structural Equation Modeling (SEM), SEM is the preferred strategy when more than one variable is used to measure a construct, such as school climate or physical health (Holmbeck, 1997). Additionally, the
comprehensive and representative sampling method employed in both Studies 1 and 2 suggested that results could be generalized across Canadian youth.

Lastly, Study 3 analyzed data collected in a longitudinal study on dating aggression by Wendy Craig, Jennifer Connolly, and Debra Pepler. While the sample size precluded the use of multi-sample analysis to test moderation, the advantage of being able to look at the influence of bullying and victimization longitudinally outweighed the challenges of a small sample size. Although many studies explore the co-occurrence of involvement in bullying and risky behaviours, few examine the influence of being involved in bullying over time.

Summary

The following three manuscripts make a significant contribution to the literature on bullying and adolescent health. The first paper examines broadly the association between bullying, victimization, and physical health in adolescence. In the second and third study, our research is focused on risky relational behaviours in adolescence. It is hoped that the results from these studies will provide guidance for health promotion programs that target youth and the environment in which they live. Thus, each paper reviews implications for prevention and interventions strategies for all youth, as well as those involved in bullying.
References


Forward to Chapter 2

Chapter 2 consists of a manuscript that will be submitted for publication. Chapter 2 adheres to APA format. My supervisor, Dr. Wendy Craig, assisted in all aspects of the research and she appears as a co-author on the manuscript. Dr. Lee Fabrigar was a committee member who provided considerable statistical and conceptual assistance and he appears as a co-author on the manuscript. The present study used archival data from the Canadian records of the Health Behaviour in School-Aged Children Survey (HBSC), a World Health Organization collaborative cross-national study (Currie, Roberts, & Morgan, Smith, SetteTobulte, Samdal, & Barnekow Rasmussen, 2004). The principal investigator for the Canadian records of the HBSC, Dr. William Boyce, is included as a co-author on the manuscript.
Chapter 2:

Risks to Adolescent Physical Health:

The Direct and Moderating Effect of Bullying and Victimization

Leila Rahey, Wendy Craig, Leandre Fabrigar, & William Boyce

Queen’s University

Kingston, Ontario, Canada
Abstract

Bullying is a serious problem with negative consequences for both the aggressor and the victim. Examining the effects of bullying and victimization on physical health however, is a relatively new area of research. In this study, we examined whether involvement in bullying predicted reports of physical health problems and physical activity. As well, we tested a moderator model, whereby the moderator effects of sex and bullying and victimization were examined on the influence of school and community climate on physical health. This model was tested using a sample of 2384 high school students in grades nine and ten (Mean age=15.2, SD=.79). The results from the present study provide support for the hypothesis that involvement in bullying is related to physical health problems and physical activity in youth. Moreover, our findings suggest that involvement in bullying moderated the influence of teachers and communities on important health protective factors. In contrast, self-reliance at school appeared to be a risk factor for reduced health and physical activity in bullying and victimized youth. Implications for health promotion programs are provided.
Risks to Adolescent Physical Health:

The Direct and Moderating Effect of Bullying and Victimization

Exposure to bullying is a serious problem for many adolescents with negative consequences that can extend into adulthood. Studies link emotional difficulties, including depression, anxiety, and suicidal behaviour, with involvement in bullying (Craig, 1998; Connolly, Craig, Goldberg, & Pepler, 2004; Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001; Olweus, 1993). Recent studies also indicate negative health effects for youth involved in bullying, as an aggressor or as a victim (Baldry, 2004; Kaltiala-Heino, Rimpela, Rantanen, & Rimpela, 2000; Slee, 1995; Rigby, 1998; Wilkins-Shurmer, O’Callaghan, Najman, Williams, & Anderson, 2003). Unfortunately, most of the studies that examine the relationship between victimization and bullying and health tend to combine reports of physical and emotional health problems into one factor (Baldry, 2004; Kaltiala-Heino, Rimpela, Rantanen, & Rimpela, 2000; Slee, 1995; Rigby, 1998). As well, research on health behaviours in youth who bully has focused solely on participation in risky or problematic behaviours (Connolly, Craig, Goldberg, & Pepler, 2004; Nansel, et al., 2001). Hence, the present study seeks to expand on previous literature by exploring the direct and moderating effects of bullying and victimization on physical health complaints and physical activity in adolescence.

Rigby (1998) and Slee (1995) were the first to suggest that bullying experiences could impinge on quality of health. Rigby (1998) suggested that victimized youth experience poor health due to the stress associated with repeated victimization and a reduced sense of connection with peers. With the large body of research indicating a negative influence of increased stressors and poor social support on health (House,
Landis, & Umberson, 1988; Natvig, Albrektsen, Anderson, & Qvarnstrom, 1999); it is not surprising that studies find victimized youth reporting increased health difficulties (Wilkins-Shurmer, O’Callaghan, Najman, Williams, & Anderson, 2003). At first glance, however, this theory of stress and social support would not appear to apply to youth who bully, as they tend to be popular in their peer group and report ease in making friends (Nansel et al, 2001; Pellegrini & Smith, 1998).

Being popular alone however, does not always equate to having a positive support-network. Poor family cohesion, reduced parental monitoring, and family conflict are common family attributes reported by youth who bully (Baldry, 2004; Espelage & Swearer, 2003). School may also be a stressor, as reports suggest that youth who bully have greater academic difficulties and are less liked by teachers than their non-involved peers (Natvig, Albrektsen, & Qvarnstrom, 2001; Olweus, 1994; Rusby, Forrester, Biglan, & Metzler, 2005). The lack of family support, coupled with academic stressors, may lead to health problems in youth who bully. Accordingly, we expect that bullying youth, as well as those that are victimized, will report increased health problems. Similarly, we expect that involvement in bullying will affect participation in health promoting behaviours, in particular, physical activity.

With the growing concern of obesity and reduced activity among youth (Centers for Disease Control, 2005; Janssen, Craig, Boyce, & Pickett, 2004), we also wanted to examine if being involved in bullying would be associated with a reduction in physical activity. Consistent with previous studies suggesting that victimized youth may disengage from school and social activities (Baldry, 2004; Buhs, Ladd, & Herald, 2006, Slee, 1994), we propose that these youth will also report decreases in physical activity at
Victimized youth may avoid school, and, as a result, have decreased opportunity and access to physical activity at school. Exclusion from physical activity opportunities, such as intramural sports, may also be one context where the victimized youth experiences bullying. Findings that victimized youth report higher levels of obesity and poorer physical fitness (Janssen, et al., 2004; Wilkins-Shurmer et al., 2003), provide support for the hypothesis that victimized youth may be engaging in physical activity less frequently than their non-victimized peers. Involvement in bullying, as an aggressor, may also affect participation in physical activities, but it is unlikely due to withdrawal from, or exclusion, by peers.

While bullying others is not associated with school avoidance or peer exclusion (Buhs, et al., 2006; Elsea, Menesini, Morita, O’Moore, Mora-Merchan, Pereira, & Smith 2003), bullying youth may not have the appropriate conflict management skills required to engage effectively in social and/or physical activities, such as team sports (Nansel, et al., 2001; Smokowski & Holland Kopasz, 2005). Involvement in bullying others may also lead to socializing with a delinquent peer group that does not value engagement in health promoting behaviours (Espelage & Swearer, 2003). Even if bullying youth attempt to engage in these activities, schools may choose to limit physical activity participation. Schools may exclude bullying youth from participating in their sports teams or in intramurals as a form of behavioural consequences for bullying behaviours that occur at school. The combination of poor peer relationships and limited access to school activities may result in bullying youth reporting decreased involvement in physical activity.
Alternatively, it is plausible that bullying others may not negatively affect involvement in physical activities. Zweig, Phillips, and Lindberg (2002) reported that youth who engage in violent behaviours were as likely to engage in health promoting behaviours, such as playing sports and exercising, as those not involved in violent behaviours. Similarly, studies on sport participation indicate that youth who engage in relational aggression may have higher rates of participation on sports teams than non-aggressive youth (Moore & Werch, 2005; Linville & Huebner, 2005; Papaioannou, Karastogiannidou, & Theodorakis, 2004). One possibility for these findings is that coaches may value aggressive and dominating behaviours displayed by youth if they prove beneficial on the field or in the arena. Consequently, bullying youth may actually have greater access to sports teams if the culture of the particular team values aggressive behaviour.

Overall, these studies suggest a need to delineate the relationship between bullying and victimization and physical health in adolescence. Using the framework of Problem Behaviour Theory (PBT), which postulates that difficulties in the perceived environment may lead to problematic health behaviours (Jessor, 1998), we expect that bullying experiences with peers will lead to poor health and reduced positive health behaviours. In addition, we expect that involvement in bullying will moderate the influence of other important environmental factors. PBT research suggests that factors in one environmental context (e.g., peers) can alter the influence of other environmental contexts (e.g., schools and communities) in either positive or negative directions (Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995). Since health promotion programs
often target schools and communities, we wanted to examine if being involved in bullying would alter the protective influence of these environments.

The Role of Schools and Community in Physical Health

Building on the model of social support and social belonging suggested by Rigby (1998), we expect that other areas of relational connection may serve as protective factors in adolescent physical health. Past studies suggest that connection to school (e.g., reporting feeling safe and connected to school) can protect youth from engaging in risky health behaviours, such as substance use and criminal behaviour, and promote participation in healthy behaviours (Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004; McNeely & Falci, 2004; Rosario, Salzinger, Feldman, & Ng Mak, 2003; Williams, et al., 2002). This relationship between health behaviours and school connection may be due to a desire to conform to school norms in youth who feel connected to school (Catalano et al., 2004). A strong connection to school also may serve as a buffer against the negative health effects that other stressors (e.g., problems at home, academic difficulties) may have on youth. Hence, we expect that increased connection to school will result in increased participation in physical activities provided by schools and decreased reports of health problems.

Communities also play an important role in adolescents’ lives. Youth report increased participation in the activities organized by their community when they feel safe and connected to the community in which they live (Rusby, et al., 2005; Seiffge-Krenke, 1998; Horowitz, McKay, & Marshall, 2005). Conversely, residing in a community plagued by violence is a risk factor for delinquency, substance use, and violence (Horowitz, et al., 2005; Rosario, et al., 2003). Youth who live in unsafe communities also
may experience increased stress, which can negatively affect sense of health and well-being. Thus, we expect that perception of community safety, as well as school climate, will influence reports of health complaints and physical activity level.

Unfortunately, bullying and victimization may attenuate the protective influence that schools and communities have on health. As bullying often occurs at school and in the nearby community, it is possible that these peer difficulties will weaken the positive influence that schools and communities can have on youth. For example, being victimized by peers may reduce the positive influence that school and communities can have on health status and participation in health promoting activities. As well, youth who bully others may not be as attached to their schools and communities as non-involved youth, which may reduce the positive influence of schools and communities. Therefore, we want to examine if bullying will alter the protective influence of schools and communities. A model of the proposed study is presented below (See Figure 1).

Figure 1. Moderator model for Bullying & Victimization

In summary, the present study seeks to examine the direct and moderating influence of bullying and victimization on physical health status and physical activity. We expect that involvement in bullying will exert a negative direct effect on health and a
negative moderating effect on the relationship between contextual factors and health. As the present study focuses on school-related bullying, we predict that the moderating influence of bullying and victimization will be greatest for the relationship between school climate and health. Lastly, we also wanted to determine the moderating effects of sex on the relationship between environmental factors and health. Studies indicate that environmental factors may exert themselves differently on health, depending on the sex of the adolescent (Williams, et al., 2002; Moore & Werch, 2005). Thus, we wanted to ascertain whether schools and communities have a similar influence on health in adolescent boys and girls.

Method

Design

The present study used data from the Canadian records of the Health Behaviour in School-Aged Children Survey (HBSC), a World Health Organization collaborative cross-national study (Currie, Roberts, & Morgan, Smith, Setterobulte, Samdal, & Barnekow Rasmussen, 2004). The HBSC is a school-based survey, which was completed according to international protocol in the 2001-02 academic year (Currie, Samdal, Boyce, & Smith, 2001).

Participants

Participants were Canadian students involved in the international study (WHO Study on School Health) investigating health behaviour and the social context of health in children and adolescents. Schools and classes were selected using a weighted probability technique to ensure that the sample reflected the geographical and key demographic features of the Canadian population in that age group (Currie et al., 2004, Currie et al.,
Youth who attended private or special needs schools, lived on the street, or were incarcerated were not included in this sample.

A total of 2384 high school students (44% males and 57% females) in grades nine and ten participated in the study (Mean age=15.2, SD=.79). Eighty-seven percent of participants identified themselves as European-Canadian, 2.3% as South Asian, 2% as Chinese, 1.9% as African or Caribbean Canadian, and 2.0% as Native Canadian. The remaining 4.8% of participants indicated “other” as their ethnic background.

All participants were treated in accordance with the ethical codes stated by the American Psychological Association (APA, 1994). Participants were required to obtain parental consent as well as provide their own consent. Institutional ethics approval was obtained from the Queen’s University General Research Ethics Board.

Measures

Measures were derived from the self-report questionnaire and consisted of individual items and pre-existing scales contained within the HBSC survey.

Victimization & Bullying. Questions derived from a modified Bully/Victim Questionnaire (Olweus, 1993) were used to assess bullying experiences. A definition of bullying was provided which included verbal, physical, and indirect forms of bullying between children who have different degrees of power or strength, and is repeated over time. One question addressed victimization experiences: “How often have you been bullied at school in the past couple of months?” One question about experiences of bullying others was asked, “How often have you taken part in bullying another student(s) at school in the past couple of months?” Responses for the questions about being bullied or bullying others in the past couple of months ranged from “I haven’t …” to “Several
times a week”. Students responded to the question on being bullied or bullying others using a five-point scale for both questions, with higher numbers representing higher frequencies.

*Physical Activity.* Four items assessed physical activity: activity during school time, free time at school, in lessons or teams in out of school time, and informal activities during out of school time. Participants could choose one of nine responses that ranged from “none at all” to “about 7 or more hours” with higher scores indicating higher amounts of each activity.

*Health Status.* Five items were included in the health status scale. Participants were asked to report on the frequency of five physical health complaints that could have occurred in the last 6 months, including headaches, stomachaches, backaches, getting to sleep, and feeling dizzy. Participants were asked to choose from one of five response options about each complaint, with responses ranging from “about every day” to “rarely or never”. Higher scores indicated lower frequency of health problems.

*School Climate.* Four scales assessing School Climate were included: student autonomy, school belonging, peer support, and teacher support. Participants were asked to indicate how much they agreed with each item, with responses ranging from strongly agree to strongly disagree. Higher scores indicated positive school climate.

*Community Climate.* Eight items were included in the Community Climate scale. The first six asked participants to indicate how much they agreed with statements about the area they live (e.g., “You can trust people around here.”). Participants could choose from five responses, ranging from strongly agree to strongly disagree. Participants were
given four response options ranging from always to rarely or never. Higher scores indicate positive community climate.

Procedure

The present study involved secondary analysis of data from the 2001/02 HBSC survey. The 2001/02 HBSC survey involved a self-completed questionnaire that was administered by classroom teachers. An international protocol provided instructions, guidelines, and policies for conducting the HBSC survey (Currie et al., 2004).

Results

Consistent with previous findings, the present study indicated that 33-41% of youth reported involvement in bullying, as either a victim or an aggressor. For physical activity, results indicated that on average participants engaged in 4.7 hours of physical activity per week (SD=3.8) at school and 5.3 hours of physical activity per week out of school (SD=4.0). Approximately 9% of boys and 15% of girls reported engaging in less than one hour of physical activity in either context. Finally, reports of health complaints indicated that 40% of boys and 52% of girls experienced at least one form of health complaint on a weekly basis in the previous six months: 37% reported headaches, 24% reported stomachaches, 30% reported backaches, 39% reported sleep difficulties, and 22% reported dizziness on a weekly basis. As well, 12% of boys and 22% of girls reported taking medication on a weekly basis for some form of physical complaint (i.e., stomach-ache, headache, difficulty sleeping).

Preliminary Analysis

An exploratory factor analysis was conducted on half of the sample (randomly selected) to determine the factor structure for each contextual scale (School and
Community Climate) and the health scales (Health Status and Physical Activity). Before conducting the factor analysis, all items were scaled to a common metric (0 to 1) so that direct comparisons could be made between model parameters. Factor analysis was conducted using Maximum Likelihood estimation to analyze and a direct oblimin rotation was used to enhance the interpretability of the solution produced. The number of factors to be extracted was determined using approaches recommended by Fabrigar, MacCallam, Wegener, and Strahan (1999): scree test of eigenvalues from the reduced correlation matrix; assessment of the relative improvement in model fit using Root Mean Square Error of Approximation (RMSEA); parallel analysis for eigenvalues from the reduced correlation matrix; and conceptual interpretability.

Next, we examined the model fit for the factor structures for each scale using the other half of the data. Confirmatory factor analysis, using Maximum Likelihood estimation in LISREL 8.52 to analyze the covariance matrix (allowing items to correlate and have uncorrelated unique variance) was employed. The scale of measurement for each of the latent variables was set by fixing one of the loadings to 1, thereby setting the latent variables to the same metric as the measured variables. The following fit indices were used to evaluate each latent variable: RMSEA, Incremental Fit Index, and standardized RMR as recommended by Bentler, Dudgeon, 1996 and Hu & Bentler (1998). See Tables 1 and 2 for the results of the Exploratory Factor Analysis for the health and contextual scales for the youth not involved in bullying or victimization.

In order to examine the direct associations among bullying, the contextual variables, and the physical health variables, Structural Equation Modelling (SEM), using Maximum Likelihood estimation in LISREL 8.52 to analyze the covariance matrix was
Table 1

*Means, standard deviations, and factor loadings for items for Physical Health*

<table>
<thead>
<tr>
<th>Noninvolved Group (N=958)</th>
<th>M(SD)</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Activity (RMSEA = 0.07, alpha = .69)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. In class time</td>
<td>.40 (.29)</td>
<td>.56</td>
</tr>
<tr>
<td>2. In free time at school</td>
<td>.34 (.29)</td>
<td>.64</td>
</tr>
<tr>
<td>3. In sports</td>
<td>.40 (.36)</td>
<td>.57</td>
</tr>
<tr>
<td>4. Informal, out of school</td>
<td>.42 (.30)</td>
<td>.62</td>
</tr>
<tr>
<td><strong>Health Status (RMSEA= .04, alpha = .74)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Headache</td>
<td>.72 (.31)</td>
<td>.69</td>
</tr>
<tr>
<td>2. Stomach ache</td>
<td>.79 (.25)</td>
<td>.67</td>
</tr>
<tr>
<td>3. Back ache</td>
<td>.76 (.31)</td>
<td>.53</td>
</tr>
<tr>
<td>4. Sleep difficulties</td>
<td>.71 (.34)</td>
<td>.50</td>
</tr>
<tr>
<td>5. Dizzy</td>
<td>.85 (.26)</td>
<td>.63</td>
</tr>
</tbody>
</table>
### Table 2

**Means, standard deviations, and factor loadings for School and Community Climate**

<table>
<thead>
<tr>
<th></th>
<th>M(SD)</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Noninvolved Group (N=958)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School Climate (RMSEA=.04)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Autonomy (alpha=.72)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Students take part in making rules</td>
<td>.47 (.27)</td>
<td>.40</td>
</tr>
<tr>
<td>2. Students work out at own pace</td>
<td>.50 (.27)</td>
<td>.42</td>
</tr>
<tr>
<td>3. Students choose own partners</td>
<td>.61 (.23)</td>
<td>.41</td>
</tr>
<tr>
<td>4. Students have say in class time</td>
<td>.38 (.26)</td>
<td>.84</td>
</tr>
<tr>
<td>5. Students have a say in class activities</td>
<td>.48 (.28)</td>
<td>.72</td>
</tr>
<tr>
<td><strong>School Belonging (alpha = .81)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Rules in school are fair</td>
<td>.63 (.24)</td>
<td>.41</td>
</tr>
<tr>
<td>2. School is a nice place to be</td>
<td>.65 (.25)</td>
<td>.77</td>
</tr>
<tr>
<td>3. I feel I belong at this school</td>
<td>.66 (.26)</td>
<td>.78</td>
</tr>
<tr>
<td>4. I feel safe at this school</td>
<td>.70 (.23)</td>
<td>.66</td>
</tr>
<tr>
<td><strong>Peer Support (alpha = .77)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Students in my class enjoy being together</td>
<td>.69 (.19)</td>
<td>.64</td>
</tr>
<tr>
<td>2. Students in my class are kind</td>
<td>.68 (.20)</td>
<td>.82</td>
</tr>
<tr>
<td>3. Students accept me as I am</td>
<td>.74 (.19)</td>
<td>.58</td>
</tr>
<tr>
<td>4. When someone feels down, someone in class tries to help</td>
<td>.65 (.22)</td>
<td>.56</td>
</tr>
<tr>
<td><strong>Teacher Support (alpha=.82)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I am encouraged to express my views in class</td>
<td>.68 (.21)</td>
<td>.57</td>
</tr>
<tr>
<td>2. Our teachers treat us fairly</td>
<td>.64 (.23)</td>
<td>.73</td>
</tr>
<tr>
<td>3. When I need extra help, I can get it</td>
<td>.77 (.18)</td>
<td>.67</td>
</tr>
<tr>
<td>4. My teachers are interested in me as a person</td>
<td>.62 (.22)</td>
<td>.75</td>
</tr>
<tr>
<td>5. Most of my teachers are friendly</td>
<td>.72 (.20)</td>
<td>.65</td>
</tr>
<tr>
<td><strong>Community (RMSEA = .06, alpha = .79)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. People say “hello” and stop to talk to each other</td>
<td>.76 (.23)</td>
<td>.61</td>
</tr>
<tr>
<td>2. It is safe for younger children to play outside</td>
<td>.84 (.18)</td>
<td>.76</td>
</tr>
<tr>
<td>3. You can trust people</td>
<td>.76 (23)</td>
<td>.82</td>
</tr>
<tr>
<td>4. There are good places to spend your free time</td>
<td>.64 (.30)</td>
<td>.34</td>
</tr>
<tr>
<td>5. Good place to live</td>
<td>.86 (.20)</td>
<td>.53</td>
</tr>
<tr>
<td>6. I could ask for help or a favor from a neighbor</td>
<td>.77 (.22)</td>
<td>.72</td>
</tr>
</tbody>
</table>
employed. RMSEA, Incremental Fit Index, and standardized RMR were used to assess model fit, as recommended by Bentler, Dudgeon, 1996 and Hu & Bentler (1998).

In order to test moderation of victimization and bullying, multi-sample analyses\(^1\), using SEM, was used to compare model fit for youth involved in bullying to those that were not. Thus, the sample was split into groups of youth who had been bullied only\(^2\) bullied others\(^3\) only, or were not involved in bullying or victimization\(^4\). The multi-sample analysis for Physical Activity involved comparing the model fit of School and Community Climate scales predicting physical activity for youth who bullied others to those that were not involved in bullying. The same procedure was then completed for youth that were victimized, where model fit was compared for the sample that reporting victimization to the sample not reporting victimization or bullying. The same procedure was then completed for the model examining the relationship between School and Community Climate and the outcome of Health Status for the comparisons of bullying versus non-involved youth and victimized versus non involved youth.

For tests of moderation of sex, two multi-sample analyses using SEM were completed comparing boys and girls, regardless of their reports on bullying or victimization. The multi-sample analysis compared model fit for girls and boys on the association of School and Community Climate and the outcome of physical activity. A separate analysis examined model fit across sex for the association between School and Community Climate and health status.

\(^{1}\) Alternative analysis are available to examine moderator effects in SEM (e.g., creating interaction terms and running the model in SEM) however, due to the complexity of a model with interaction terms, multi-sample analysis was used.

\(^{2}\) Reporting bullying others more than once in the past 2 months.

\(^{3}\) Reporting being bullied more than once in the past 2 months.

\(^{4}\) Reporting no bullying or being bullied in the past 2 months.
Tests were first completed to determine if the factor structure of each model was equivalent across the two groups being compared (factorial invariance) using chi square difference test (Wegener & Fabrigar, 2000). When factorial invariance did not hold, items were removed systematically to determine which item was the reason for the significant difference between models. Once factorial invariance was established across groups, tests of moderation were conducted. To test for differences across groups, we further constrained the model being examined so that the pathway parameters between the contextual scales and the health scale were constrained to be equal for the two groups being compared. When the chi square difference test was significant, moderation was indicated.

**School and Community Climate & Bullying**

SEM analysis was used to examine whether School (Student Autonomy, School Belonging, Peer Support, and Teacher Support) and Community Climate predicted bullying and victimization (using the entire sample). The model displayed good fit (ML, $\chi^2(280) = 1298.65, p < .05; \text{RMSEA} = 0.043; \text{IFI} = .97; \text{SRMR} = .039$). School belonging and peer support were negatively associated with being victimized and teacher support was positively associated with being victimized. Teacher support was negatively associated with reports of bullying others.

**Bullying & Physical Health**

SEM analyses were performed to test whether bullying, victimization, and gender predicted self-reports of physical activity (Model 1) and health status (Model 2) using the entire sample. The model examining the association between bullying, victimization, and sex and the outcome of health status indicated adequate fit (ML, $\chi^2(23) = 368.92, p < .05$;
Victimization and bullying others were negatively associated with health status. Sex was also associated with health status. Being a boy was positively associated with health status. The model examining the association between bullying, victimization, and sex and the outcome of physical activity indicated adequate fit (ML, $\chi^2(13) = 268.08$, p < .05; RMSEA = 0.09; IFI = .88; SRMR = .067). Bullying was positively associated with out-of-school activity. As well, being a boy was positively associated with physical activity in and out of school.

**School and Community Climate & Physical Health**

In order to determine if contextual factors also predicted physical health, two separate SEM analyses were used to examine health status and physical activity. For each model tested, the five contextual scales (School Belonging, Student Autonomy, Peer Support, Teacher Support, and Community Climate) and one of the health scales (Physical Activity or Health Status) were included. When assessing the association between contextual variables and health status, the results indicated good model fit (ML, $\chi^2(747) = 1379.96$, p < .05; RMSEA = 0.038; IFI = .94; SRMR = .063). Autonomy and school belonging were positively associated with health status. As well, for the analysis of physical activity, the results indicated good model fit (ML, $\chi^2(670) = 1353.13$, p < .05; RMSEA = 0.041; IFI = .96; SRMR = .064). Peer support and community climate were positively associated with physical activity.

**The Moderating Effects of Bullying & Sex**

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1 Since our study indicated that boys reported higher rates of physical activity, and boys tend to engage in bullying more often, we wanted to ensure that the positive association was not confounded by sex. The present study did not indicate that sex moderated the relationship between bullying and activity, thus, we postulate that it was not a higher number of bullying boys that produced the positive association between bullying and physical activity.

2 The SEM analyses were conducted on the group of participants that did not report any involvement in bullying, as a victim or as an aggressor.
Bullying. For the comparison of the sample involved in bullying others versus those not involved in bullying (as a victim or a bully), factorial invariance held and no modifications were made to the measurement model for contextual factors predicting health status. The relationship between autonomy, teacher support, and community climate, and health status was significantly different across groups and hence, moderation of bullying was indicated. Bullying attenuated the positive association between autonomy and health status and accentuated the positive association between teacher support and health status. For community climate, bullying attenuated the negative association between community climate and health status, such that community climate was positively associated with better reports of health for the bullying group alone. See Table 3 for the results of the chi square difference test and pathway coefficients for each group.

Victimization. For victimization, the test of factorial invariance did not hold across samples (ML, $\chi^2_{\text{diff}}(21) = 33.17$, $\chi^2_{\text{crit}}(21) = 32.67$). The model modification indicated that for children experiencing victimization, the four items of physical activity loaded onto two constructs: in-school activity and out-of-school activity. Once the model was modified, the model fit remained adequate with (ML, $\chi^2(679) = 1330.79$, $p<.05$; RMSEA =0.037; IFI=.97; SRMR=.050). The test of moderation indicated that the relationship between autonomy, peer support, community climate, teacher support (trend) and in-school activity was moderated by victimization. Victimization accentuated the negative association between autonomy and peer support and in school activity and accentuated the positive association between teacher support and community climate and in-school activity. See Table 4 for the path coefficients for both groups and the chi square difference tests.
Table 3

*Results of multiple group analysis on the influence of environmental factors on health status comparing noninvolved youth to youth reporting bullying others*

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Non-involved Group (N=958)</th>
<th>Bullying Group (N=285)</th>
<th>Chi Square Difference (df=1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>.22*</td>
<td>-.29</td>
<td>8.30*</td>
</tr>
<tr>
<td>School Belonging</td>
<td>.22*</td>
<td>-.06</td>
<td>1.42</td>
</tr>
<tr>
<td>Peer Support</td>
<td>.09</td>
<td>.29*</td>
<td>1.47</td>
</tr>
<tr>
<td>Teacher Support</td>
<td>.16</td>
<td>.60*</td>
<td>4.17*</td>
</tr>
<tr>
<td>Community Climate</td>
<td>-.05</td>
<td>.24*</td>
<td>5.09*</td>
</tr>
</tbody>
</table>

*p<.05
Table 4

Results of multiple group analysis on the influence of environmental factors on physical activity in-school comparing noninvolved youth to youth reporting victimization

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Coefficients</th>
<th>Non-involved Group (N=958)</th>
<th>Victimized Group (N=466)</th>
<th>Chi Square Difference (df=1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>-.05</td>
<td>-.26*</td>
<td></td>
<td>3.86*</td>
</tr>
<tr>
<td>School Belonging</td>
<td>.19*</td>
<td>.03</td>
<td></td>
<td>.88</td>
</tr>
<tr>
<td>Peer Support</td>
<td>.07</td>
<td>-.30</td>
<td></td>
<td>3.98*</td>
</tr>
<tr>
<td>Teacher Support</td>
<td>-.02</td>
<td>.26*</td>
<td></td>
<td>3.14*</td>
</tr>
<tr>
<td>Community Climate</td>
<td>.13*</td>
<td>.44*</td>
<td></td>
<td>6.68*</td>
</tr>
</tbody>
</table>

*p<.10, *p<.05
Sex. For the comparison of boys and girls, the test of factorial invariance did not hold across samples for the model measuring the relationship between contextual factors and physical activity. The process of identifying the invariant relationships indicated that two items be removed: one from the teacher scale ("My teachers are interested in me as a person.") and one from the student support scale ("I feel like I belong at this school"). Once the items were removed, the model fit was still adequate (ML, $\chi^2 (568) = 1434.56$, $p<.05$; RMSEA=0.039; IFI.97; SMRM=.039). The test of moderation indicated a significant moderator effect of gender on the relationship between teacher support and physical activity, with the relationship between teacher support and physical activity being negative for boys and no effect for girls (See Table 5).
Table 5

Results of multiple group analysis on the influence of environmental factors on physical activity comparing boys and girls

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Coefficients</th>
<th>Chi Square Difference (df=1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys (N=899)</td>
<td>Girls (N=466)</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-.07</td>
<td>-.08</td>
</tr>
<tr>
<td>School Belonging</td>
<td>.18*</td>
<td>.07</td>
</tr>
<tr>
<td>Peer Support</td>
<td>.20*</td>
<td>.05</td>
</tr>
<tr>
<td>Teacher Support</td>
<td>-.26*</td>
<td>.06</td>
</tr>
<tr>
<td>Community Climate</td>
<td>.23*</td>
<td>.18*</td>
</tr>
</tbody>
</table>

*p<.05
Discussion

The purpose of the present study was to explore the direct and moderating effects of bullying and victimization on adolescent physical health. Previous studies suggest that youth who are involved in bullying will also report increased health problems due to the increased stressors and reduced support they experience (House, et al., 1988; Natvig, et al., 1999; Rigby, 1998). Our findings support these findings, as reports of bullying and victimization predicted increased reports of health complaints. Involvement in bullying also had a moderating effect on the influence of environmental factors on physical health. Bullying attenuated the influence of school related autonomy, indicating that feelings of self-reliance at school may have a negative effect on health for youth involved in bullying. On the other hand, the association between teacher support, community climate, and health was accentuated by involvement in bullying, suggesting that these environmental factors may serve as a health protective factor for youth involved in bullying. These findings have important implications for health promotion programs that target schools and communities.

Bullying & Physical Health Status

Previous studies suggest that youth engaging in problem behaviours, including bullying, may be at increased risk for health problems and risky health behaviours (Connolly et al., 2004; Nansel et al., 2001; Jessor, 1998). Our results are consistent with previous findings, with increasing reports of bullying and victimization predicting physical health complaints. As previous studies have often combined physical and emotional health complaints into a single category of health complaints (Baldry, 2004; Kaltiala-Heino, Rimpela, Rantanen, & Rimpela, 2000; Slee, 1995; Rigby, 1998), our
study extends previous research by examining the relationship between bullying and physical health complaints alone. Schools and parents need to be aware of the increased physical health problems of youth involved in bullying, as these health problems may lead to other problematic behaviours. For instance, bullying youth may engage in substance use as a form of self-medication for the increased health problems they experience. Additionally, school avoidance in victimized youth may reflect the increased health problems experienced by these youth. Thus, programs that target bullying should provide information about how to cope with health difficulties, as well as raising awareness of the link between bullying and physical health problems. Our study also suggested that involvement in bullying alters the influence of school and community protective factors on physical health.

*Moderating Effects of Bullying on Physical Health Status*

In our analysis on health complaints, youth not involved in bullying reported a positive association between school-related autonomy and school belonging, and health status. That feelings of self-reliance at school and connection to school predicted better health status, suggests that the combination of a secure attachment to school and opportunities for autonomy lead to improved health in youth not exposed to bullying. When youth reported bullying others however, the influence of these protective factors on physical health changed.

Involvement in bullying others diminished the positive influence of autonomy, suggesting that feelings of self-reliance in bullying youth may be a risk factor for health problems in this group. Since bullying youth report increased dislike of school and academic difficulties (Natvig et al., 2001; Olweus, 1994; Rusby, et al., 2005), it is
possible that these youth do not experience the security at school needed to benefit from autonomy opportunities provided by schools. Studies on the developmental significance of autonomy argue that youth only benefit from autonomy opportunities when they feel supported by teachers and parents (Allen, Marsh, McFarland, Boykin, McElhaney, Land, & Jodl, 2002; Soenens & Vansteenkiste, 2005). Findings from the present study are consistent with this theory, as support from teachers and community appear to have offset the negative effect of bullying on physical health. It is possible that the experience of being more supported by adults at school and the community provided increased support to these insecurely attached youth, and hence fewer problems were reported (Allen et al., 2002). Alternatively, it is plausible that feeling supported at school and in the community lead bullying youth to decrease their participation in the risky health behaviours that can compromise health. When we examined physical activity, we found a similar pattern of moderation for involvement in bullying, however this time it was for youth who were victimized.

**Bullying & Physical Activity**

We expected that involvement in bullying would predict decreased physical activity, as well as attenuate the influence of school and community climate. Our findings, in contrast, suggest that bullying others predicted increased out-of-school physical activity. Since bullying was not associated with increased activity at school, the results raise questions about the factors that may contribute to the association between bullying others and higher rates of participation out-of-school activities. For example, it is possible that bullying youth are experiencing increased access to sports teams that value aggression. On the other hand, it is also possible that our findings reflect the
increased time that bullying youth spend in the community and in unsupervised activities (Espelage & Swearer, 2003). Perhaps bullying youth are spending their unsupervised time in non-risky behaviours, such as informal games of basketball or street hockey, rather than other risky behaviours. Unfortunately, we could not ascertain whether increased activity level was attributable to negative or positive factors, and as such, recommend that future research explore bullying youth’s participation in community activities.

Regardless of the reason for increased participation by bullying youth, our findings raise concerns about the extent of bullying behaviours that may occur in community led activities. If youth who bully at school continue to engage in these negative behaviours while attending community-based activities, these communities and community programs will need additional support to monitor youth and prevent bullying. As most prevention and intervention programs focus on school-level bullying, these findings suggest that an increase in community-based prevention programming is needed.

When turning to the relationship between victimization and physical activity, our reports did not indicate that victimization predicted reduced physical activity as we expected. We based our predictions on previous findings, which indicate that victimized youth disengage from school-related activities (Slee, 1994). Recent studies by Baldry (2004) and Buhs et al., (2004), however, argue that indirect (e.g., spreading rumours, being left out), as opposed to direct verbal or physical, forms of victimization predict withdrawal from school. As we did not differentiate among types of victimization, it is possible that we have underestimated the influence of certain types of victimization on
physical activity. Future studies should examine whether physical activity levels depend on the type of victimization experienced.

**Moderating Effects of Bullying on Physical Activity**

Although victimization did not predict lower rates of physical activity, it did moderate the influence of the school and community protective factors on in-school activity. The overall pattern of moderation suggested that feelings of self-reliance and peer support were risk factors for decreased physical activity in victimized youth. As well, our findings suggest that as school belonging and peer support decrease, reports of victimization increase. Similar to bullying youth, victimized youth often report less positive feelings towards school and their classmates (Nansel et al., 2001), and consequently, may feel less secure at school than youth not experiencing victimization. Thus, it is plausible that victimized youth do not have the school and peer support to benefit from school related autonomy opportunities. For example, victimized youth may not view opportunities to choose their own partners at school in a positive light if their options are from a group of unsupportive classmates. Rather, having decision control in partner choice may lead to withdrawal from activities, including physical activities, in victimized youth who feel disconnected from school and unsupported by peers. Like bullying youth, victimized youth may need support from other people in their immediate environment in order engage in health promoting activities.

Similar to our results on bullying and health complaints, we also found that victimization accentuated the influence of teacher and community on physical activity at-school. As studies link social skills difficulties with reports of victimization (Espelage & Swearer, 2003), it is possible that victimized youth require the assistance of teachers to
join in school activities. Moreover, feelings of connection to the community may buffer victimized youth from the negative influence of feeling unsupported by peers and disconnected from schools. Overall, these results suggest that victimized youth need additional support from adults, coupled with less reliance on themselves and peers, to make healthy decisions about engaging in physical activity at school.

Adolescent Health

Although not a central aspect of the present study, our findings on reports of physical activity and health complaints were concerning. Inactive lifestyles in adolescence can lead to numerous health difficulties, including obesity, diabetes, and heart disease (Centers for Disease Control and Prevention, 2005). Recent reports on physical activity in adolescence suggest that youth should engage in at least one hour of physical activity every day (CDC, 1996). The present study indicated that many youth do not engage in physical activity, with 9% of boys and 15% of girls reporting less than one hour of physical activity, a week, in either school or non-school time. Our findings, which links peer support and community climate with increased physical activity, suggest that programs designed to promote physical activity target these contexts.

Another concerning finding was the extent of physical health complaints reported by youth. The present study indicated that 40% of boys and 52% of girls experienced at least one form of health complaint on a weekly basis in the previous six months, 12% & of boys and 22% of girls reported taking medication on a weekly basis for some form of physical complaint (i.e., stomach-ache, headache, difficulty sleeping). These rates appear to be particularly concerning for an age group that is often perceived as the healthiest age-group in the population (Seiffge-Krenke, 1998). Once again, our findings may
provide some direction for health promotion programs, as feelings of connection to school and independent decision-making predicted fewer health complaints in non-involved youth. Moreover, our findings suggest that bullying youth, who feel less connected to school, may need additional support from teachers in order to improve health. Together, these findings suggest that improving school climate and teacher support, while providing appropriate opportunities for autonomy for youth who are securely attached to school, may lead to better overall health in adolescence.

Limitations and Directions for Future Research

The present study also has methodological limitations that need to be considered. Measures of bullying, environmental factors, and physical health were based on self-reports, and consequently are subject to shared method variance problems. Studies on adolescence, however, suggest that self-report may be the most appropriate method of evaluating health complaints and involvement in bullying in this age group, as they are less likely to confide in parents and teachers (Baldry, 2004). Furthermore, a review of health risk studies indicates that adolescents accurately self-report physical activities (Brener, Billy, & Grady, 2003). In addition, the present study did not include an analysis of potentially confounding factors, such as a school’s access to recreation equipment. As the present study involved secondary analysis of previously collected data, we were not able to include such confounds in our analysis. Thus, future studies should seek to examine whether other factors, such as school’s recreation facilities, helps to explain the connection between school climate and physical health in adolescence. Another limitation of the present study is reflected in the use of cross-sectional data. Future
studies could address this limitation by following up youth, over time, to determine if earlier experiences with bullying lead to health problems and changes in activity level.

Although the cross-sectional design and self-report technique are methodological short-comings, our use of Structural Equation Modeling (SEM) enhanced the interpretability of our results. SEM is the preferred strategy when more than one variable is used to measure a construct, such as school climate or physical health (Holmbeck, 1997). As well, by conducting multi-sample analysis in SEM, we were able to assess whether the measurement model used to test moderation was similar regardless of bullying involvement or sex of participants. Based on the multi-sample analysis adjustments were made to the physical activity factor. Our analysis indicated that although all four items loaded onto one physical activity factor for non-involved youth, the model for victimized youth suggest that the factor be broken down into in-school and out-of-school physical activity. Had we not run the model comparisons across the different groups, we may not have detected the moderating effects of victimization on in-school activity. As well, minor adjustments were made to the models for sex comparisons, but in this case, the adjustments did not affect the overall findings of the study.

Conclusions

Despite these limitations, the present findings add to the literature by exploring the negative health correlates of bullying behaviours. Consistent with studies on Problem Behaviour Theory (Jessor, 1998), engagement in risky behaviours (bullying) within the peer context, negatively influenced adolescent health and altered the influence of important protective factors. The moderating role of bullying and victimization identified
teachers and communities as important health protective factors for youth involved in bullying. In contrast, self-reliance at school appeared to be a risk factor for reduced health and physical activity in bullying and victimized youth, respectively. Finally, although we were able to delineate the environmental factors that appear to promote physical health in adolescence, the high rates of health problems and low rates of physical activity were concerning. Health promotion programs need to continue to address these health difficulties, while being sensitive to the complex relationship of environmental and bullying factors that can influence physical health in adolescence.
References


Centers for Disease Control and Prevention/Division of Adolescent and School Health.  


Chapter 3 consists of a manuscript that will be submitted for publication. Chapter 3 adheres to APA format. My supervisor, Dr. Wendy Craig, assisted in all aspects of the research and in the preparation of the manuscript and she appears as a co-author on the manuscript. Dr. Lee Fabrigar was a committee member who provided considerable statistical and conceptual assistance and he appears as a co-author on the manuscript. The present study used archival data collected in the national study on sexual behaviours among adolescents, Canadian Youth, Sexual Health and HIV/AIDS Study (CYSHHAS). Thus, one of the principal investigators for the CYHHAS, Dr. William Boyce, is also included as a co-author on the manuscript.
Chapter 3:

The Relationship between Bullying, Victimization, and Risky Sexual Behaviours

Leila Rahey, Wendy Craig,

Leandre Fabrigar, & William Boyce

Queen’s University

Kingston, Ontario, Canada
Abstract

With over 50% of youth report being sexually active by 17 years of age (Maticka-Tyndale, 2001), determining the correlates of risky sexual health behaviours continues to be a top public health priority. To date, no study has examined the association between involvement in bullying and sexual behaviours in adolescence. In this study, we examined whether bullying and victimization predicted reports of age of sexual debut, number of sexual partners, and experiences with sexual coercion. As well, we tested a moderator model, whereby the moderator effects of sex, bullying, and victimization was examined on the influence of parent and friendship factors on risky sexual behaviours. This model was tested on a sample of 7329 high school students in grades nine and eleven from across Canada. Thirty percent of the sample reported having sexual intercourse at the time of the study. The results provide evidence for a link between bullying and victimization and engagement in a range of risky sexual behaviours. As well, the present findings suggest that fathers, in particular, may serve as an important protective factor against risky sexual behaviours in bullying youth. Implications for prevention and intervention programs are provided.
The Relationship between Bullying, Victimization, and Risky Sexual Behaviours

Sexuality is an important developmental aspect of adolescence. Unfortunately, engagement in risky sexual behaviours, such as earlier age of sexual debut, may lead to sexually transmitted infections (STI’s) and pregnancy in youth. Recent reports indicate that nearly a quarter of a million youth in developed nations are infected with HIV (Deas, 2003) and that adolescents have the highest age-rates for chlamydia, gonorrhea, human papillomavirus (HPV), and herpes simplex virus type 2 (HCV-2) (SIECCAN, 2004). Identifying the determinants of risky sexual behaviours, therefore, continues to be a priority among adolescent health researchers. Previous studies indicate that adolescents’ social environment makes an important contribution to participation in risky sexual behaviours (French & Dishion, 2003; Mandara, Murray, & Bangi, 2003; Metzler, Noell, Biglan, Ary, & Smolkowski, 1994; Small & Luster, 1994). To date, no study has examined whether bullying experiences can influence risky sexual behaviours. The present study seeks to address this gap in the literature by examining the direct and moderating influence of bullying and victimization on three areas of risky sexual behaviours: Age of first intercourse, number of sexual partners, and reports of sexual coercion.

Many theories exist to explain how the social environment can influence sexual behaviours. For example, Problem Behaviour Theory (PBT) posits that youth engage in clusters of risky behaviours due to common underlying difficulties within the social and intrapersonal system (Jessor, 1998). Developmental theory provides a similar argument, suggesting that common etiological factors, within the intrapersonal, inter-personal, and
biological environment, can predict participation in multiple risky health behaviours (Lerner, 1992; Small & Luster, 1994; Williams, et al., 2002). Since bullying is an interpersonal problem within the peer environment (W. M. Craig, personal communication, May 20, 2006), these theories would predict increased participation in a range of risky behaviours among youth involved in bullying, including risky sexual behaviours.

**Bullying & Victimization**

Studies on bullying are consistent with this model of multi-problem behaviours, as bullying youth report increased involvement in substance use, tobacco use, and dating aggression (Connolly, Pepler, Craig, & Taradash, 2000; Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001). While research has not explored the relationship between involvement in bullying and sexual behaviours, several studies indicate a link between youth violence and participation in risky sexual behaviour (Champion, Foley, DuRant, Hensberry, Altman, & Wolfson, 2004; Harvey & Spigner, 1995; Prinstein & LaGreca, 2004; Tubman, Windle & Windle, 1996). In addition, studies of adolescent dating relationships indicate that bullying youth participate in advanced dating behaviours earlier than their non-bullying peers, which may include early entry into sexual relationships (Connolly et al., 2000). The combination of increased risky behaviours, participation in violent behaviours, and advanced forms of dating, suggests that bullying youth are at risk for participation in increased risky sexual behaviours. Predictions about the influence of bullying on risky sexual behaviour in victimized youth, however, are less clear.
Although many studies suggest that victimized youth have health problems, few explore the association between being bullied and participating in risky health behaviours. The extant literature on health behaviours in victimized youth indicates that victimized youth engage in few risky health behaviours (Nansel et al., 2001). Nansel et al. (2001) suggested that victimized youth engage in delinquent behaviours less frequently, compared to other youth, due to their limited social skills. Studies also suggest that parents may be overly involved in victimized youths’ activities (Smokowski & Holland Kopasz, 2005), which may lead to decreased risky behaviours in this group. Hence, victimization is often thought to “protect” youth from involvement in risky health behaviours.

Conversely, studies of young adults suggest that being the victim of violence can lead to a variety of risky behaviours, including increased risky sexual behaviours (Ellickson et al., 2004; Roberts, Auinger, & Klein, 2005). As well, studies on sexual harassment suggest that earlier experiences with being victimized by peers in childhood can transcend into later experiences of being sexually harassed in adolescence (Craig, Pepler, Connolly, & Henderson, 2001). It is plausible that peer victimization is only associated with risky health behaviour that have a relational component, such as sexual behaviours. For example, victimized youth, who are often rejected and isolated from peers, may accede to sexual advances as a mechanism of gaining peer acceptance (Prinstein, Meade, & Cohen, 2003). Additionally, exposure to victimization through bullying may result in increased exposure and susceptibility to victimization in other relationships, including sexual relationships.
Together, these studies suggest a need to investigate the relationship between bullying and victimization and risky sexual behaviours. Using the framework of PBT and developmental contextualism, we expect that bullying experiences with peers will lead to younger age of sexual debut, multiple sex partners, and increased sexual coercion. In addition, we expect that involvement in bullying will moderate the influence of other important environmental factors. Both PBT and developmental contextualism (Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995; Lerner, 1992), argue that changes in one system or environment (e.g., peer relationships) can alter the influence of another system or environment (e.g., parent relationships) in either a positive, or a negative, direction. Since previous research on adolescent sexuality highlights the influence of peer behaviour and parent-child relationships (French & Dishion, 2003; Metzler et al., 1994), we wanted to examine if bullying would alter the influence of these environments.

*The Role of Parents and Peers in Risky Sexual Behaviours*

Previous studies implicate parents and peers as important environmental factors in sexual decision-making and exposure to sexual coercion during adolescence. For example, perception of low parental monitoring and poor parent-child communication are risk factors for younger age of sexual debut and increased sexual partners (Ream & Savin-Williams, 2005). As well, studies link exposure to domestic violence with increases in sexual coercion experiences in youth (Ellickson, et al., 2005; Howard & Wang, 2005; Kaestle & Halpern, 2005; Voisin, 2005). Parental influence, however, may exert itself differently, depending on the sex of the child. Studies indicate that relationship quality with parents may be a greater predictor of girl’s sexual behaviour, whereas parental control may be a more potent predictor for boy’s sexual behaviours.
(Garcia, Pender, Antonakos, & Ronis, 1998, McNeely, Shew, Beuhring, Sieving, Miller, & Blum, 2002). Few studies parse out the influence of fathers and mothers on risky sexual behaviours in boys and girls. Thus, the present study seeks to add to the literature by examining whether relationships with mothers and fathers exert differential influence on risky sexual behaviours. The present study also seeks to examine the influence of both negative and positive peer behaviours on adolescent sexuality.

Because peer interactions become more frequent during adolescence (Espelage, Holt, & Henkel, 2006; LaGreca, Prinstein, & Fetter, 2001; Prinstein, et al., 2003), we wanted to examine the influence of peers on risky sexual behaviours. Previous studies reveal that teens are more likely to participate in risky sexual behaviours when their peers participate in risky health behaviours (Metlzer et al., 1994). Researchers use a model of deviancy training to explain the co-occurrence of negative behaviours within peer groups. Deviancy training suggests that peer modelling of behaviours and reinforcement of behaviours by peers leads youth to engage in a similar set of problematic behaviours (Dishion, 2000). Therefore, reports of deviant peer behaviours should predict increased risky health behaviours, including participation in risky sexual behaviours. Less is known however, about the influence of positive peer behaviours on risky sexual behaviours, hence the present study seeks to explore whether positive, as well as negative, peer behaviours, influence risky sexual behaviours in adolescents.

Unfortunately, peer difficulties, such as bullying may accentuate the negative influence of risk factors such as deviant peer behaviours and offset the positive influence of positive factors such as positive peer behaviours and positive relationships with parents. To date, studies have not examined if being involved in bullying can alter the
influence of peer behaviours and parental relationships on risky sexual behaviours. Therefore, the present study seeks to add to the literature by examining whether bullying and victimization has a moderating effect on the relationship between parents and peers and risky sexual behaviours in adolescence. A model for the proposed study is presented below (See Figure 1).

*Figure 1. Moderator model for Bullying & Victimization*

In summary, the present study seeks to examine the direct and moderating influence of bullying and victimization on age of sexual debut, number of sexual partners, and sexual coercion. We expect a positive association between involvement in bullying and risky sexual behaviours. We also expect differential moderating effects of bullying on the relationship between social environmental factors and risky sexual behaviours. As bullying youth report spending less time under parental supervision and more deviant peers than non-bullying youth (Espelage & Swearer, 2003; Nansel, et al., 2001; Smokowski & Holland Kopasz, 2005), we expect that bullying others will accentuate the influence of peer behaviours and attenuate the influence of the parent-child relationship. We expect an opposite effect for victimization. Since victimized youth
report increased parental involvement and less secure peer relationships (Smokowski & Holland Kopasz, 2005), we expect that victimization will accentuate the influence of parental factors and attenuate the influence of peer behaviours. Lastly, we also wanted to determine the moderating effects of sex on the relationship between social environmental factors and risky sexual behaviours. Studies indicate that parent and peer factors may exert themselves differently on sexual behaviour, depending on the sex of the adolescent (Williams, et al., 2002; Garcia, et al., 1998). We expect that the present study will support previous findings, which indicate that parent-child relationships exert a greater influence on girls’ involvement in risky sexual behaviours in comparison to boys (Garcia, et al., 1998).

Method

Design

The present study used a subset of data collected in the national study on sexual behaviours among adolescents, Canadian Youth, Sexual Health and HIV/AIDS Study (CYSHHAS), conducted by William Boyce, Maryanne Doherty, Christian Fortin, and David MacKinnon (2002). The survey was translated into French and English and was pilot tested in 24 classrooms (500 students).

Participants

A total of 7329 high school students (46% males and 54% females) in grades nine and eleven from across Canada participated in the study (Mean age=15.21, SD=1.2). Seventy four percent of participants stated that they lived with their mother and their father, 12% lived with their mother only, 3% lived with their father only, 8% lived with a parent and a stepparent, and 0.7% reported living with a grandparent. Although participants were not asked to indicate their family income, they reported on how wealthy
they perceived their family to be. Seventy percent reported that their family was of average wealth, 21% reported above average, and 9% reported below average wealth.

All participants were treated in accordance with the ethical codes stated by the American Psychological Association (APA, 1994). Participants were required to obtain parental consent as well as provide their own consent (Appendix A). Institutional ethics approval was obtained from the Queen’s University General Research Ethics Board.

**Measures**

Measures were derived from the self-report questionnaire and consisted of individual items and pre-existing scales\(^1\) contained within the CYSHHAS survey (See Appendix E for a copy of the CYSHHAS survey).

**Sexual Activity.** One item asked about whether participants had sexual intercourse. Participants could choose either a “yes” or “no” response.

**Sexual Risk Behaviour.** Two items were used to examine Sexual Risk Behaviour. The first item asked participants to provide the age (in years) they first had sexual intercourse. The second item asked participants to report the number of people they have had sexual intercourse with over their lifetime.

**Sexual Coercion.** Two items were used to create the Sexual Coercion scale. Participants were asked to indicate whether or not they had experiences with unwanted sexual intercourse and/or pressure to have sex. The items were recoded so that a response of “no” on both items would result in a score of zero, a “yes” to either item would result in a score of one, and “yes” to both would result in a score of two.

\(^1\) For the pre-existing scales, factor analysis was conducted to confirm what items loaded onto each factor. See the Results section for the results of the factor analysis.
**Parent-Child Relationship**. Fourteen items were used to assess mother-child and father-child relationships. For all items, participants were asked to indicate how much they agreed with each statement about their mother or father (e.g., “My mother understands me”). Six options were provided and ranged from strongly disagree to strongly agree. Responses were recoded so that high scores indicated a less positive relationship with each parent. When participants indicate they did not have contact with their mother and/or their father, they were not included in the analysis on the respective parent-child relationship.

**Friend Behaviour**. Eight items were used to assess Friend’s Behaviours. For each item, participants were asked to indicate the extent to which they agreed with each statement that describes their friends. Seven response options were provided for participants and ranged from none to all, as well, two options were provided where participants could indicate if they were unaware of their friends’ behaviours or if they had no close friends. Responses were recoded so that high scores indicated greater involvement in risky behaviours and lower involvement in positive behaviours.

**Victimization & Bullying**. Questions derived from a modified *Bully/Victim Questionnaire* (Olweus, 1993) were used to assess victimization experiences. A definition of bullying was provided which included verbal, physical, and indirect forms of bullying between children who have different degrees of power or strength, and is repeated over time. One question addressed victimization experiences: “How often have you been bullied at school in the past two months in the ways listed?” The types of victimization included being bullied about race and religion, being made fun of because of appearances, being physically bullied, being threatened, and having rumours told about
them. Five responses were provided for each question and ranged from “I haven’t …” to “Several times a week,” with higher numbers representing higher frequencies of being bullied. The mean score for all five types of bullying was used for the victimization score. For bullying others, participants were asked “How often have you taken part in bullying another student(s) at school in the past two months?” Five responses were provided for the question and ranged from “I haven’t …” to “Several times a week,” with higher numbers representing higher frequencies of bullying others.

Procedure

The 2002 CYSHHAS survey is a self-completed questionnaire that was administered by classroom teachers during class time. A protocol provided instructions, guidelines, and policies for conducting the CYSHHAS survey.

Results

Thirty to forty-five percent of adolescents reported in involvement in bullying, as either a victim or an aggressor. Similar rates were found within the sexually active sub-sample. Thirty percent of the sample (N=2260) reported having sexual intercourse at the time of the study. Of the participants reporting having had sex, 45% were male and 55% were female. The mean age of sexually active participants was 15.2 years (SD=1.2), with sexually active youth reporting a mean age of 14.5 years (SD=1.3) when they first had intercourse. Of the total sample, 71% reported having no sexual partners, 15% reported having one sexual partner, 5% reported having two partners, 3% reported three partners, and 6% reported having four or more partners. On average, sexually active youth reported having 3 (SD=3.66) sexual partners. In terms of sexual coercion, 7% (boys= 5% and girls =9%) reported having unwanted sex and 10% (boys=5% and girls =13%) and
reported being pressured to engage in sex. Of the 481 youth who reported having unwanted sex, 36% reported not having been pressured to have sex.

Statistical Analysis

An exploratory factor analysis was conducted on half of the sample (randomly selected) to determine the factor structure for each contextual scale (Friend Behaviour and Relationship with Parents). Before conducting the factor analysis, all items were scaled to a common metric (0 to 1) so that direct comparisons could be made between model parameters. Factor analysis was conducted using Maximum Likelihood estimation and a direct oblimin rotation was used to enhance the interpretability of the solution produced. The number of factors to be extracted was determined using approaches recommended by Fabrigar, MacCallam, Wegener, and Strahan (1999): scree test of eigenvalues from the reduced correlation matrix; assessment of the relative improvement in model fit using Root Mean Square Error of Approximation (RMSEA); parallel analysis for eigenvalues from the reduced correlation matrix; and conceptual interpretability.

Next, we examined the model fit for the factor structures for each scale using the other half of the data. Confirmatory factor analysis, using Maximum Likelihood estimation in LISREL 8.52 to analyze the covariance matrix (allowing items to correlate and have uncorrelated unique variance) was employed. The scale of measurement for each of the latent variables was set by fixing one of the loadings to 1, thereby setting the latent variables to the same metric as the measured variables. The following fit indices were used to evaluate each latent variable: RMSEA, Incremental Fit Index, and standardized RMR as recommended by Bentler, Dudgeon, 1996 and Hu & Bentler (1998). See Table 1 for the results of the
Table 1

Means, standard deviations, and factor loadings for items in Mother-Child, Father-Child, and Friend Behaviour scales

<table>
<thead>
<tr>
<th>Non-involved Group</th>
<th>M</th>
<th>(SD)</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother-Child (N=2022, RMSEA =0.06, alpha =.78)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. My mother understands me.</td>
<td>.32</td>
<td>.27</td>
<td>.74</td>
</tr>
<tr>
<td>2. I have a lot of arguments with my mother</td>
<td>.41</td>
<td>.27</td>
<td>.49</td>
</tr>
<tr>
<td>3. My mother trusts me.</td>
<td>.22</td>
<td>.23</td>
<td>.79</td>
</tr>
<tr>
<td>4. What my mother thinks of me is important.</td>
<td>.25</td>
<td>.23</td>
<td>.67</td>
</tr>
<tr>
<td><strong>Father-Child (N=1954, RMSEA =0.00, alpha =.77)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. My father understands me.</td>
<td>.37</td>
<td>.28</td>
<td>.73</td>
</tr>
<tr>
<td>2. I have a lot of arguments with my father</td>
<td>.38</td>
<td>.27</td>
<td>.47</td>
</tr>
<tr>
<td>3. My father trusts me.</td>
<td>.23</td>
<td>.23</td>
<td>.75</td>
</tr>
<tr>
<td>4. What my father thinks of me is important.</td>
<td>.25</td>
<td>.23</td>
<td>.61</td>
</tr>
<tr>
<td><strong>How many close friends… (N=1429, RMSEA=.05)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Negative Friend Behaviours (alpha=.81)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Smoke cigarettes</td>
<td>.24</td>
<td>.29</td>
<td>.70</td>
</tr>
<tr>
<td>2. Have had sex</td>
<td>.31</td>
<td>.32</td>
<td>.72</td>
</tr>
<tr>
<td>3. Used drugs to get stoned</td>
<td>.26</td>
<td>.30</td>
<td>.72</td>
</tr>
<tr>
<td>4. Have been drunk</td>
<td>.58</td>
<td>.37</td>
<td>.76</td>
</tr>
<tr>
<td><strong>Positive Friend Behaviours (alpha=.53)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Like school</td>
<td>.69</td>
<td>.31</td>
<td>.59</td>
</tr>
<tr>
<td>2. Think getting good marks at school is important</td>
<td>.28</td>
<td>.27</td>
<td>.59</td>
</tr>
<tr>
<td>3. Get along with their parents</td>
<td>.34</td>
<td>.27</td>
<td>.54</td>
</tr>
<tr>
<td>4. Play on sports teams</td>
<td>.51</td>
<td>.31</td>
<td>.33</td>
</tr>
</tbody>
</table>
Exploratory Factor Analysis for the contextual scales for the youth not involved in bullying or victimization.

In order to examine the direct associations among bullying, the contextual variables, and the sexual health variables, Structural Equation Modelling (SEM), using Maximum Likelihood estimation in Lisrel 8.52 to analyze the covariance matrix (allowing items to correlate and have uncorrelated unique variance) was employed. RMSEA, Incremental Fit Index, and standardized RMR were used to assess model fit, as recommended by Bentler, Dudgeon, 1996 and Hu & Bentler (1998).

In order to test moderation of victimization and bullying, multi-sample analyses\(^1\), using SEM to analyze the covariance matrix, was used to compare model fit for youth involved in bullying to those that were not. Thus, the sample was split into groups of youth who had been bullied only\(^2\), bullied others only\(^3\), or were not involved in bullying or victimization\(^4\). For the moderating effects of bullying, multi-sample analysis examining the relationship between Friend Behaviours (Positive and Negative Behaviours) and the outcomes of Age of First Intercourse, Number of Sexual Partners, and Sexual Coercion (one model for each outcome) was conducted comparing youth who reported bullying others to those not involved in bullying. The same procedure was then completed for the models examining predictors of Mother Relationship and Father Relationship (separate models). In order to examine the moderating effects of victimization, the same process was completed, but this time youth who were victimized

\(^1\) Alternative analysis are available to examine moderator effects in SEM (e.g., creating interaction terms and running the model in SEM) however, due to the complexity of a model with interaction terms, multi-sample analysis was used.

\(^2\) Reporting bullying others more than once in the past 2 months.

\(^3\) Reporting being bullied more than once in the past 2 months.

\(^4\) Reporting no bullying or being bullied in the past 2 months.
and those non-involved youth were compared in the multi-sample analysis. For tests of moderation of sex, multi-sample analyses using SEM were completed comparing boys and girls, regardless of their reports on bullying or victimization.

Tests were completed to determine if the factor structure was equivalent across the two groups being compared (factorial invariance) using chi square difference test (Wegener & Fabrigar, 2000). When factorial invariance did not hold, items were removed systematically to determine which item was the reason for the significant difference between models. Once factorial invariance was established across groups, tests of moderation were conducted. To test for differences across groups, we further constrained the model so that the pathway parameters between the contextual scales and the sexual health scale were constrained to be equal for the two groups being compared. When the chi square difference test was significant, moderation was indicated.

**Bullying & Sexual Health**

Three SEM analyses were performed to test whether bullying, victimization, and gender were associated with the outcomes of age of first intercourse\(^1\), number of sexual partners\(^2\), and experiences with sexual coercion. Since models employed single indicator factors, we did not expect to find adequate model fit. Hence, we will not report on model fit for the main effects of bullying and sex. The models indicated a significant association between victimization and bullying and younger age of first intercourse, increased number of sexual partners, and increased sexual coercion experiences. As well,

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\(^1\) Participants were excluded if they reported having sexual intercourse prior to age 11.

\(^2\) Analysis were conducted excluding youth who reported having more than 20 partners and another set of analysis with youth reporting any number of partners. No differences in results were found when the group of participants reporting more than 20 partners was excluded.
being a boy was associated with more sexual partners whereas being a girl was associated with increased coercive experiences.

**Friend Behaviour**

In order to determine if friend behaviours also predicted sexual-risk taking, three SEM analyses (one for each sexual health outcome) were used to examine if positive and negative friend behaviours were associated with sexual risk factors. Due to poor model fit, one of the friend behaviours (“Likes school”) was removed from the model. When assessing age of first intercourse (ML, $\chi^2 (36) = 126.61$, $p<.05$; RMSEA =0.08; IFI=.86; SRMR=.055) and number of partners (ML, $\chi^2 (36) = 153.40$, RMSEA =0.09; IFI=.87; SRMR=.052) among sexually active youth, a significant association was found for the models examining friend behaviours. Negative friend behaviours were associated with younger age of first intercourse and greater number of sexual partners. For sexual coercion experiences among all youth (including participants who had not indicated having sexual intercourse), there was a significant association for Negative Friend Behaviours (ML, $\chi^2 (41) = 285.03$, $p<.05$; RMSEA =0.07; IFI=.95; SRMR=.047) and increased sexual coercion.

**Mother Relationship**

Three SEM analyses (one for each sexual health outcome) were used to examine if relationship with their mother was associated with sexual risk factors (for Age of First Intercourse and Number of Partners, only sexually active youth were included in the analysis). Lower mother-child relationship (ML, $\chi^2 (13) = 71.76$, $p<.05$; RMSEA =0.05; IFI=.98; SRMR=.027) was associated with increased sexual coercion.

**Father Relationship**
Three SEM analyses (one for each sexual health outcome) were used to examine if relationship with their father was associated with sexual risk factors (for Age of First Intercourse and Number of Partners, only sexually active youth were included in the analysis). Due to poor model fit, one of the items (“My father understands me.”) was removed from the model. Lower father-child relationship (ML, $\chi^2(5) = 27.07$, $p<.05$; RMSEA =0.04; IFI=.99; SRMR=.020) was associated with increased sexual coercion.

**Bullying and Victimization as Moderators**

*Age of First Intercourse.* For the multi-sample analysis of victimization versus non involved youth and the outcome of friend behaviours (ML, $\chi^2(41) = 163.01$, RMSEA=0.08), the test of moderation indicated that the relationship between Negative Friend Behaviours and Age of First Intercourse was moderated by victimization at a trend level. Victimization attenuated the negative association between having friends with negative behaviours and age of first intercourse.

For the comparison of the sample involved in bullying others versus non-involved youth and the outcome of father-child relationship (ML, $\chi^2(5) = 4.64$, RMSEA=0.00), the test of moderation indicated that the association between Father-Child Relationship and Age of First Intercourse was moderated by bullying. Bullying accentuated the negative association of having a poor relationship with fathers and age of first intercourse. See Table 2 for the results of the chi square difference test and pathway coefficients for non-involved youth, bullying youth, and victimized youth.

*Number of Partners.* For the comparison of the sample involved in bullying others versus non involved youth and the outcome of father-child relationship (ML, $\chi^2(5) = 4.66$, RMSEA=0.00), the test of moderation indicated that the association between
### Table 2

*Results of multiple group analysis on the influence of environmental factors on age of first intercourse comparing non-involved youth to youth reporting involvement in bullying*

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Pathway Coefficients</th>
<th>Pathway Coefficient</th>
<th>Pathway Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-involved Group</td>
<td>Bullying Group</td>
<td>Chi Square Difference for Bullying (df=1)</td>
</tr>
<tr>
<td>Negative Friend Behaviours</td>
<td>-2.34*</td>
<td>-.27</td>
<td>2.05</td>
</tr>
<tr>
<td>Positive Friend Behaviours</td>
<td>-.51</td>
<td>-1.16*</td>
<td>.17</td>
</tr>
<tr>
<td>Mother-Child Relationship</td>
<td>-.16</td>
<td>-.73</td>
<td>.96</td>
</tr>
<tr>
<td>Father-Child Relationship</td>
<td>.22</td>
<td>-1.28*</td>
<td>4.91*</td>
</tr>
</tbody>
</table>

*p<.10, *p<.05

1 The chi square analysis compared the victimized group to the group not reporting involvement in bullying and victimization.
Father-Child Relationship and number of partners was moderated by bullying. Bullying accentuated the positive association of having a poor relationship with fathers and number of partners. See Table 3 for the results of the chi square difference test and pathway coefficients for non-involved, bullying, and victimized youth.

**Sexual Coercion.** For the multi-sample comparisons examining sexual coercion, no moderator effects were found. See Table 4 for the results of the chi square difference test and pathway coefficients for non-involved, bullying, and victimized youth.

**Sex as a Moderator**

For the measurement models of Friend Behaviours, tests of factorial invariance revealed that the measurement model was not consistent for boys and girls. The process of identifying the invariant relationships was not adequate in identifying what items should be removed, so the model with all friend behaviours was used. For the Relationship with Father models one of the items (“My father understands me.”) was removed due to poor model fit. As well, for the Relationship with Mother models one of the items (“What my mother thinks of me is important.”) was removed due to poor model fit.

**Age of First Intercourse.** The test of moderation indicated a significant moderator effect of gender on the relationship between Positive Friend Behaviour and Age of First Intercourse (ML, $\chi^2 (56) = 286.85$, RMSEA=0.07), with being a girl accentuating the negative influence of having few friends with positive behaviours and age of first intercourse.
Table 3

*Results of multiple group analysis on the influence of environmental factors on number of partners comparing non-involved youth to youth reporting involvement in bullying*

<table>
<thead>
<tr>
<th>Pathway Coefficients</th>
<th>Pathway Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-involved Group</td>
</tr>
<tr>
<td>Negative Friend Behaviours</td>
<td>6.45*</td>
</tr>
<tr>
<td>Positive Friend Behaviours</td>
<td>1.04</td>
</tr>
<tr>
<td>Mother-Child Relationship</td>
<td>1.40</td>
</tr>
<tr>
<td>Father-Child Relationship</td>
<td>-.30</td>
</tr>
</tbody>
</table>

*¹p<.05

¹ For the chi square analysis, the victimized group was compared to the group reporting no involvement in bullying.
Table 4

Results of multiple group analysis on the influence of environmental factors on sexual coercion comparing non-involved youth to youth reporting involvement in bullying

<table>
<thead>
<tr>
<th>Pathway Coefficients</th>
<th>Pathway Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-involved Group</td>
</tr>
<tr>
<td>Negative Friend Behaviours</td>
<td>.21*</td>
</tr>
<tr>
<td>Positive Friend Behaviours</td>
<td>.09</td>
</tr>
<tr>
<td>Mother-Child Relationship</td>
<td>.16*</td>
</tr>
<tr>
<td>Father-Child Relationship</td>
<td>.13*</td>
</tr>
</tbody>
</table>

*<p>.05

¹ For the chi square analysis, the victimized group was compared to the group reporting no involvement in bullying.
The test of moderation indicated a significant moderator effect of gender on the relationship between poor Father-Child relationship and Age of First Intercourse (ML, $\chi^2(6) = 13.96$, RMSEA=0.04). The negative association between poor father-child relationship and age of first intercourse was accentuated for girls. See Table 5 for the results of the chi square difference test and pathway coefficients for boys and girls.

Sexual Coercion. The test of moderation indicated a significant moderator effect of gender on the relationship between Sexual Coercion and all three contextual factors. For the model examining friend behaviours (ML, $\chi^2(56) = 690.02$, RMSEA=0.07), the positive association between negative friend behaviours and sexual coercion was accentuated by being a girl. For the model examining relationship with mother (ML, $\chi^2(6) = 11.68$, RMSEA=0.02) and father (ML, $\chi^2(13) = 65.43$, RMSEA=0.04), the positive association between poor relationship with mother and father was accentuated by being a girl. See Table 6 for the results of the chi square difference test and pathway coefficients for boys and girls.
Table 5

Results of multiple group analysis on the influence of environmental factors on age of first intercourse comparing boys and girls

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Coefficients</th>
<th>Chi Square Difference (df=1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>Girls</td>
<td></td>
</tr>
<tr>
<td>Negative Friend Behaviours</td>
<td>-1.08*</td>
<td>-.32</td>
</tr>
<tr>
<td>Positive Friend Behaviours</td>
<td>-.62</td>
<td>-1.83*</td>
</tr>
<tr>
<td>Mother-Child Relationship</td>
<td>-.22</td>
<td>-.38*</td>
</tr>
<tr>
<td>Father-Child Relationship</td>
<td>.08</td>
<td>-.49*</td>
</tr>
</tbody>
</table>

*p<.05
Table 6

*Results of multiple group analysis on the influence of environmental factors on sexual coercion comparing boys and girls*

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Coefficients</th>
<th>Chi Square Difference (df=1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td>Negative Friend Behaviours</td>
<td>.16*</td>
<td>.37*</td>
</tr>
<tr>
<td>Positive Friend Behaviours</td>
<td>.03</td>
<td>.11*</td>
</tr>
<tr>
<td>Mother-Child Relationship</td>
<td>.09*</td>
<td>.20*</td>
</tr>
<tr>
<td>Father-Child Relationship</td>
<td>.07*</td>
<td>.17*</td>
</tr>
</tbody>
</table>

*p<.05
Discussion

Drawing on a national study on adolescent sexual behaviour, the present study examined the influence of bullying and victimization on age of sexual debut, number of sexual partners, and sexual coercion. We expected to find a positive association between involvement in bullying others and sexual behaviours. Our findings supported our hypothesis, with bullying, and victimization predicting increases in the three types of risky sexual behaviours examined. As well, we examined whether being involved in bullying would moderate the influence of key contextual variables. Bullying did moderate the influence of contextual factors, but not in the direction we expected. In bullying youth, father relationship exerted a stronger and protective influence on risky sexual behaviours, rather than a weaker and more negative influence, as we had predicted. In addition, gender moderated the influence of contextual factors. Being a girl was associated with increased influence of parents and peers. The present findings have important implications for violence prevention programs and sexual health promotion programs for adolescents.

Bullying & Victimization

Literature on sexual health suggests that increased involvement in violence can lead to increased risky sexual behaviours (Champion, et al., 2004; Harvey & Spigner, 1995; Prinstein & LaGreca, 2004; Tubman, et al., 1996). Our findings were consistent with previous studies, as increased involvement in bullying predicted younger age of first intercourse and higher number of sexual partners. As well, our results indicate that youth who bully are at increased risk for engaging in unwanted sex and experiencing increased pressure to have sex. Given that previous research indicates that youth who bully also
participate in a range of risky behaviours, these findings support the model of multiple problem behaviour suggested by PBT and developmental theory. Consequently, youth involved in bullying may be at risk for a range of health difficulties, including STI’s and teen pregnancy, which suggests that sexual health promotion programs target bullying youth specifically. Based on our findings, we also suggest that programs that seek to reduce bullying behaviour include a component on the added sexual risks of bullying youth. Since bullying youth tend to congregate with other youth who engage in risky behaviours (Nansel, et al., 2001), health promotion strategies may need to target the larger peer group of bullying youth, as they may be particularly vulnerable for the transmission of sexual transmitted infections. When we turn to victimized youth, we found similar associations between risky sexual behaviour and involvement in bullying.

Although previous studies on bullying propose that victimized youth are less vulnerable to engagement in risky behaviours (Nansel et al., 2001), our results suggest otherwise. Findings from the present study indicate a link between victimization and younger age of first intercourse and increased number of sexual partners. Since our study included youth who were victimized only (and not engaging in bullying) in the analysis of victimization, it is unlikely that the increased risky sexual behaviours reflect an underlying association with engagement in aggressive behaviours. Thus youth who are victimized, as well as those that bully others, are at increased risk for engaging in risky sexual behaviours. Perhaps victimized youth, who experience peer exclusion and teasing, are more likely to accede to sexual advances as a way of gaining entrance into the peer group. As well, it is possible that due to limited social experiences (Espelage & Swearer, 2003), victimized youth do not have the skills to negotiate sexual relationships. That
victimized youth also reported increased rates of sexual coercion, further suggests that they may not have the social skills required to avert risky sexual behaviour, including unwanted sexual experiences. Due to the increased rates of all three risky sexual behaviours investigated in the present study, we argue that victimized youth may be particularly vulnerable to increased morbidity and mortality related to sexual risk behaviours. As studies had not previously examined the sexual behaviours of victimized youth, these findings identify the need for targeted sexual health promotion strategies to prevent victimized youth from engaging in risky sexual behaviours.

For both bullying and victimized youth, sexual health programs need to explore how peer relationships may influence their choices about sexual behaviours and relationships. Similar to the findings on dating violence (Connolly, Pepler, Craig, and Taradash, 2000), these results suggest that negative peer experiences may transcend into difficult or dangerous sexual relationships, placing an already vulnerable group at greater risk for health problems and future relational difficulties. Furthermore, it is possible that early experiences with bullying does not only increase adolescent sexual risk, but may extend into adulthood as a negative relational pattern in sexual relationships. Since, this is the first study that we are aware of to examine the association between bullying and adolescent sexual behaviour, replications of the study with a broader range of ages and a longitudinal design are important. Our findings on the moderator effect of bullying on risky sexual behaviours, also provides insight for health programs and future studies.

*Moderation of Bullying*

In our analysis on age of sexual debut, youth not involved in bullying reported a positive association between having friends with negative behaviours and earlier age of
first intercourse. When youth were involved in bullying, the influence of friend behaviours was somewhat different. For youth who reported bullying others, having fewer friends with positive behaviours predicted younger age of sexual debut. As well, having a more positive relationship with their father was associated with older age of sexual debut. In the multi-sample analysis, only the father-child relationship was moderated by bullying others, suggesting that the father-child relationship may be a protective factor against earlier sexual debut for bullying youth. Similar results were found for the moderating effect of bullying on number of sexual partners as bullying also moderated the influence of the father-child relationship on number of sexual partners. Hence, the father-child relationship appeared to be a protective factor for youth engaged in bullying others. While few health promotion programs specifically target fathers, this study provides evidence for promoting relationships with father as a mechanism of decreasing risky sexual behaviours in bullying youth.

*Moderation of Victimization*

Our results indicated moderation of victimization, at a trend level, on only one of the risky sexual behaviours we examined: age of sexual debut. The model for victimized youth did not indicate a significant association between negative friend behaviours and sexual debut, as was found in the model for non-involved youth. As reports of age of sexual debut were retrospective (all youth in the analysis were sexually active at the time of the study), it is possible that the influence of current friends did not affect entry into sexual activity. Perhaps victimized youth who became sexually active changed their friendship group when they became sexually active, which led to decreased influence of current friends on past sexual behaviour. Alternatively, it is possible that victimized
youth who became sexually active had less stable friendships prior to their sexual debut, which led to a diminished association between current friend behaviour and entry into sexual activity. Since the present study was cross-sectional in design, it was not possible to ascertain the stability of friendships in victimized youth. Thus, future studies should include a longitudinal analysis of the influence of friends on sexual behaviours in victimized youth.

Otherwise, the models for peer and parent influence on risky sexual behaviour were similar across victimized youth and non-involved youth groups. For example, negative friend behaviours predicted increased number of partners in both non-involved and victimized youth. Similarly, the models for victimized and non-involved youth indicated that increased negative friend behaviours and poorer quality of relationships with parents predicted increased sexual coercion. These findings suggest similar sexual health promotion strategies for both victimized and non-involved youth, by targeting negative friend behaviours to reduce number of partners and sexual coercion and parent-child relationship being targeted to reduce sexual coercion.

*Moderating Effects of Gender*

A secondary goal of the present study was to examine the moderator effects of gender on risky sexual behaviours. Previous studies suggest that parental influence may differ for boys and girls. Overall, the findings suggest that girls are more susceptible than boys to the influence of parental relationship when it comes to risky sexual behaviour. In addition, our findings suggested that the influence of friend behaviours varied by gender, with positive friend behaviours predicting older age of first intercourse in girls only.
These findings are in concert with previous studies that suggest girls are more sensitive to the affect of relational factors than boys (Garcia, et al., 1998).

Limitations and Directions for Future Research

The present study is not without limitations. Although we were able to draw on a large national study, the present study used a cross-sectional design. Cross-sectional studies prevented us from being able to ascertain whether peer factors preceded risky sexual behaviours or whether youth engaging in risky behaviours consequently became involved in delinquent peer groups and bullying behaviour. For example, it is plausible that youth who engage in sex at an earlier age, and with more partners, are more vulnerable to peer teasing and harassment than their non sexually active peers. Additionally, youth who engage in risky sexual behaviours may seek out youth who engage in a similar set of behaviours (Metzler et al., 1994).

Secondly, the self-report strategy used in the present study may have resulted in shared method variance and self-report bias. The self-report design, however, may be the most appropriate for sexual and bullying behaviour, as youth tend not to report these behaviours to parents and teachers (Baldry, 2004). For reports of peer behaviour and parent-child relationship, however, the present study could have benefited from a multi-informant design. The present study was also not able to account for the potentially confounding effect of a variety of factors (e.g., parental monitoring), which may make significant contributions to the relationship between parents and peer influence and risky sexual behaviour (Ream & Savin-Williams, 2005). Unfortunately, the CYHHAS data set did not include items on a variety of potentially confounding factors, such as parental monitoring, which is reported to influence both bullying and sexual activity. Thus, future
studies on bullying and sexual health should seek to include potentially confounding factors, such as parental monitoring, when examining the influence of environmental factors on risky sexual behaviours.

In as much as the present study had methodological limitations, the study also had many strengths. The sample size allowed us to investigate bullying and risky sexual behaviour using a more complex statistical design, such as that used in SEM analysis of moderation. SEM is the preferred technique for tests of moderation involving multi-item factors, such as the peer and parent factors used in the present study (Holmbeck, 1997). Lastly, by conducting multi-sample analysis in SEM we were able to assess whether the measurement model used to test moderation was similar regardless of bullying involvement or sex of participants. Our results from the multi-sample analysis indicated that mother and father factors be examined in separate models. Had we not run the model comparisons across the different groups, we may have included both parent factors in one model, and possibly not have detected the moderating effects of bullying on father relationship.

Conclusions

Overall, the present study adds to the literature in important ways. Consistent with PBT and developmental theories (Jessor, 1998; Williams et al., 2002), difficulties with bullying within the peer context negatively influenced risky sexual behaviours. More importantly, our results indicate that both those who are the aggressors and those who are victimized are at similar risk for earlier age of first intercourses, increased sexual partners, and increased sexual coercion. Finally, our results suggest that fathers may play an important role in reducing risky sexual behaviours in bullying youth. With the
increasing rates of STI’s reported by youth, these findings provide guidance for health promotion programs that seek to reduce the negative consequences of risky sexual behaviours. Specifically, our findings suggest that programs target youth involved in bullying, while being sensitive to the intricate interplay of environmental factors that can influence risky sexual behaviours in all adolescents.
References


Peer harassment in school: The plight of the vulnerable and victimized (pp. 242-262). Guilford Press: California.


Forward to Chapter 4

Chapter 4 consists of a manuscript that will be submitted for publication. Chapter 4 adheres to APA format. My supervisor, Dr. Wendy Craig, assisted in all aspects of the research and in the preparation of the manuscript and she appears as a co-author on the manuscript. Dr. Lee Fabrigar was a committee member who provided considerable statistical and conceptual assistance and he appears as a co-author on the manuscript. The present study used archival data collected in the Teen Dating Violence and Media study (TDVM). The principal authors for the TDVM, Dr.’s Wendy Craig, Jennifer Connolly, and Debra Pepler, are included as co-authors on the manuscript.
Chapter 4:
Dating Violence in Mid Adolescence: A Longitudinal Study of the Direct and Moderating Influence of Bullying and Victimization

Leila Rahey, Wendy Craig, Leandre Fabrigar
Jennifer Connolly, & Debra Pepler

Queen’s University

Kingston, Ontario, Canada
Abstract

Peer relationships make a significant contribution to the incidence of dating violence behaviours in youth. Few studies, however, examine whether peer aggression, in the form of bullying, leads to increased violence in dating relationships. In this study, we examined whether bullying and victimization predicted reports of dating violence one year later. As well, we tested a moderator model, whereby the moderator effects of sex and involvement in bullying were examined on the influence of parent and friendship relational factors on dating violence across mid adolescence. This model was tested using a sample of 427 high school students, in grades 9-13, over a three-year period, who reported having a partner at the last point in data collection. The results supports previous research on bullying and dating violence, by indicating that earlier experiences with bullying others may be a risk factor for dating violence during adolescence. As well, the findings suggest that involvement in bullying others may diminish the influence of parents and friends on dating violence behaviours. Implications for prevention and intervention programs are provided.
Dating Violence in Mid Adolescence: A Longitudinal Study of the Direct and Moderating Influence of Bullying and Victimization

In the last two decades, researchers have established that teen dating violence is a prevalent problem with an array of negative outcomes. Reports indicate that between 25-40% of youth experience some form of dating violence (Halpern, Oslak, Young, Martin, & Kupper, 2001; Hickman, Jaycox, & Aronoff, 2004; Wekerle & Wolfe, 1999; Wolfe & Feiring, 2000). Furthermore, studies reveal that teen dating violence can lead to socio-emotional difficulties, risky health behaviours, and domestic violence in adulthood (Ackard & Neumark-Sztainer, 2002; Callahan, Tolman, & Saunders, 2003; Henton, Cate, Koval, Lloyd, & Christopher, 1983; Howard & Qi Wang, 2003). Therefore, determining the antecedents of dating violence behaviours continues to be an important research question addressed in the literature. One area that has received little attention is the potential transmission of peer abuse into romantic relationships. A study by Connolly, Pepler, Craig, and Taradash (2000) indicated that bullying others may be a risk factor for dating violence during early adolescence. We sought to advance this line of research by examining if bullying and victimization predicts future reports of dating violence victimization and perpetration among older adolescents. As previous studies implicate parents and peers in the development of dating violence behaviours (Arriaga & Foshee, 2004), we also wanted to examine if involvement in bullying would moderate the risk and protective factors within these domains.

*Dating Relationships*

The onset of dating behaviours is an important aspect of adolescent development. By mid adolescence, approximately 50% of youth report having had a romantic
relationship (Collins, 2003). Although it was previously proposed that dating relationships during this time-period were transitory and inconsequential to development, recent studies indicate that dating relationships can be long lasting and very influential during the teen years (Collins, 2003). Researchers now argue that experiences with dating relationships during adolescence may lay the foundation for partnering behaviour in adulthood (Connolly et al., 2000; Connolly, Craig, Goldberg, & Pepler, 2004; Collins, 2003; Wekerle & Wolfe, 1999). Hence, experiencing positive dating relationships and relationship security in youth may lead to healthy relational behaviours with partners and spouses in adulthood. Unfortunately, many youth report dating experiences that are characterized by physical and social aggression, which may lead to problematic relationships later in life.

Dating violence is defined as any attempt to control a dating partner through physical, psychological, or sexual aggression (Lewis & Fremouw, 2001). Research on teen romantic relationships indicates that violence within dating relationships is mutual in adolescence, with each partner experiencing victimization as well as perpetration (Wekerle & Wolfe, 1999). Researchers propose that these early dating experiences may create a template for an aggressive relational style that extends into adult romantic relationships (Arriaga & Foshee, 2004; Collins, 2003; Connolly, et al., 2000; Wekerle & Wolfe, 1999). Should these early aggressive dating patterns re-occur in adulthood, a future generation might be exposed to relational violence. Thus, there is a great impetus to understand the precursors of teen dating violence in order to break the cycle of violence.

*Antecedents of Dating Violence*
Previous reports on dating violence focus on two key areas of influence: parents and peers. Parents influence their children’s relationships in many ways. For example, youth who experience harsh parental discipline and witness inter-parental violence report increased participation in dating violence and an array of delinquent behaviours (Brengden, Vitaro, Tremblay, & Wanner, 2002; Howard, Qiu, Boekeloo, 2003; Jackson & Foshee, 1998; Lewis & Fremouw, 2001; Linder, Crick, & Collins, 2002; Linder & Collins, 2005; Wolfe, 2006; Wolfe, Wekerle, Scott, Straatman, & Grasley, 2004).

Interestingly, some studies suggest that boys are more vulnerable to the influence of negative parenting (Wolfe, 2006), while others provide evidence for a greater affect of negative parenting on girls (Jackson & Foshee, 1998; Malik, Sorenson, & Aneshensel, 1997). Studies cite social learning theory as an explanation for the association between experiences with childhood maltreatment and harsh discipline and future violent behaviour in both boys and girls (Bandura, 1965).

Using social learning theory, researchers postulate that youth who are exposed to aggressive forms of conflict resolution at home will exhibit similar behaviours when they begin to engage in relationships with peers and dating partners (Lewis & Fremouw, 2001). As well, parental maltreatment may lead to increased tolerance for violence in future relationships. Wekerle and Wolfe (1999) offered that youth exposed to parent level violence may develop an internal working model in which coercion and abuse are effective means of gaining power and security in relationships. Furthermore, exposure to parental maltreatment and harsh discipline may result in a “premature” emphasis on peer relationships as a mechanism to meet security and intimacy needs (Wekerle & Wolfe, 1999). An early focus on peers is typically associated with increased deviant behaviours
and increased risky behaviours within opposite sex relationships (Brendgen, Vitaro, & Bukowski, 2000). Peers are not solely a negative influence, however, as many peer factors contribute to positive youth development and prevention of relational violence.

Having positive friendships can protect youth from involvement in many forms of relational aggression (Linder & Collins, 2005; Schwartz, Dodge, Pettit, & Bates, 2000). For example, quality friendships help support age-appropriate individuality and autonomy, which researchers suggest are important precursors for healthy dating relationships (Zimmer-Gembeck, 2002). Insecure and aggressive friendships patterns, on the other hand, may result in lowered expectations in other relationships, including romantic relationships (Linder & Collins, 2005). Friends may also exert an influence on individuals through the behaviours they model and the support they provide for aggressive behaviours. Studies indicate that both boys and girls are influenced by the degree of dating violence their friends engage in, as well as their perception of peer support for violent behaviour (Arriaga & Foshee, 2004). Finally, peer social aggression may pose an additional risk factor for dating violence, as most adolescent romantic relationships begin from their extended peer group (Connolly et al, 2000; Wekerle & Wolfe, 1999). Thus, youth who have aggressive peers may be more likely to have a dating partner who also engages in and endorses dating violence behaviour. Since having insecure friendships and having aggressive friends are risk factors for dating violence during the teen years, it is not surprising that reports indicate a link between bullying and dating violence.

Dating Violence and Bullying
Connolly et al., (2000) were the first to examine the transmission of peer abuse from bullying to dating relationships. Their study indicated that bullying youth, in early adolescence, reported increased rates of dating violence perpetration and victimization, as well as diminished romantic relationship quality (Connolly et al., 2002). These results suggest that involvement in bullying may be an important risk factor for dating violence and domestic violence, as youth may be learning to gain relational power through aggression (Connolly et al., 2000). Since the youth were in the early developmental stages of dating and the base rate of dating aggression was low, Connolly et al., (2000) argued that future research should examine the link between bullying and dating violence when dating behaviours become established. As well, since the study used a cross-sectional design, it is difficult to ascertain whether earlier experiences of bullying were a risk factor for dating aggression or vice versa.

In the present study, we were concerned with whether earlier experiences with bullying would predict future involvement in dating violence across mid adolescence. Following from the previous study, we speculate that bullying youth will report increased involvement in violence perpetration and victimization in their dating relationships during mid adolescence. Since the previous study had not examined youth who were victimized in bullying incidences, we also wanted to determine if earlier victimization predicts involvement in dating violence one year later.

Extrapolating from studies on other areas of victimization, including parental maltreatment and violent victimization in the community (Arriaga & Foshee, 2004; Linder & Collins, 2005; Malik, et al., 1997), we suggest that earlier experiences with victimization will predict future involvement in dating violence. We hypothesize that
victimized youth who have learned that violence begets power, may accept violence as a tool for gaining power in their dating relationships. Moreover, we propose that victimized youth will report increased dating violence due to underlying socio-emotional difficulties and peer rejection. Previous studies indicate that youth with poor emotion regulation and insecure attachment with peers may be particularly vulnerable to dating violence (Wekerle & Wolfe, 1999). Victimization, as well as bullying others, may also influence dating behaviours by altering the influence of protective and risk factors for teen dating violence.

_The Moderating Role of Bullying_

Bullying may further intensify the problem of dating aggression by accentuating the effects of factors that contribute to dating violence (e.g., harsh parental discipline and aggressive relationships with friends) and attenuating the effects of those that appear to protect against dating violence (e.g., friendship quality). For instance, youth who have grown up in harsh and strict environments, and consequently experience bullying may be at greater risk for involvement in dating violence. These youth may have learned through parental models that the use of force is acceptable in relationships. Subsequent involvement in bullying may further reinforce and consolidate their beliefs and behaviours surrounding the use of violence in relationships. Thus, both bullying and victimization experiences may accentuate the negative influence of harsh parental discipline on dating violence. Alternatively, the influence of bullying on the relationship between friendship quality and dating violence, may differ depending on whether bullying involved being the aggressor or the victim.
Because bullying youth report having more aggressive friends than their non-involved peers (Haynie, Nansel, Eitel, Crump, Saylor, & Yu, 2001), it is plausible that earlier reports of friendship quality will be associated with increased dating violence. Having close relationships with aggressive peers may result in increased reinforcement of bullying and dating violence behaviours. Studies on dating violence support this hypothesis, with reports indicating that boys with aggressive friends are more likely to engage in dating violence than those with non aggressive friends (Brengden, Vitaro, Tremblay, & Wanner, 2002). Conversely, friendship quality may provide a protective influence against involvement in dating violence for youth who are victims of bullying behaviour. Past studies on bullying indicate that victimized youth who have quality friendships are less likely to suffer negative consequences (Hodges, Boivin, Vitaro, & Bukowski, 1999). In the same study, Hodges et al., (1999) demonstrated that youth who have friends are less likely to experience bullying in the future than those that report not having any friends. Whether these friendships can offset the trajectory into dating violence, as it does in peer victimization, is unknown.

Present Study

This study examines the direct and moderating influence of bullying and victimization on dating violence among late adolescent boys and girls. Our goals are to examine whether involvement in bullying will predict participation in dating violence one year later and whether involvement in bullying would alter the influence of parental discipline and friendship quality on dating violence. Finally, since studies on dating violence suggest that gender may play an important role in how
contextual factors influence dating violence, we will examine whether gender will moderate the influence of parents and peers.

**Method**

*Design*

The present study used archival data collected in a larger study on dating aggression and media consumption by Wendy Craig, Jennifer Connolly, and Debra Pepler. The Teen Dating Violence and Media study (TDVM) is a longitudinal study with assessment waves once a year for three years.

*Participants*

Overall, 817 students\(^1\) (49% male and 51% female) participated in all three waves of data collection. In year one, the students who participated in all three years of the study, were in grades nine through eleven and 14 to 17 years old (M=15.01, SD=.84).

Sixty-three percent of participants identified themselves as European-Canadian, 13% as Asian-Canadian, 8.7% as African or Caribbean-Canadian, 5.4% as South-Asian, 1.7% as Latin-American, and 1.6% as Native Canadian. The remaining 6.9% of participants indicated “other” as their ethnic background.

*Measures*

Measures were derived from individual items and pre-existing scales on the TDVM survey (see Appendix F for the TDVM survey). For the present study, scales were created for the factors of friendship quality, parental discipline, and dating violence victimization and perpetration. In order to create the scales, an exploratory factor

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\(^1\) Analyses were completed to determine if the participants who dropped out after Time 1 were significantly different than those that remained in the study. No significant differences were found for key demographic variables. For the predictor variables, the participants that dropped out reported significantly higher scores on reports of intimacy with friends and harsh parental discipline than did the participants who remained in the study.
analysis was be used to determine which items would create each scale. Each scale was then examined using a confirmatory factor analysis prior to data analysis. See Results section for the results of the factor analysis.

Demographic Information. The Focus on You Questionnaire (Connolly & Konarski, 1994) is a 15 item self-report measure completed by participants that asks about general demographic questions, including sex of the participant.

Dating Violence Behaviours. A modified version of the Conflict Tactics Scale (Straus, 1979) evaluated aggression and victimization in dating relationships. Twelve items asked about Dating Violence Victimization and twelve items asked about Dating Violence Perpetration. Items assessed verbal and physical aggression directed towards or received from a romantic partner (i.e., telling rumors, hitting, slapping, kicking or biting). Participants could choose from five responses that ranged from never to always with higher scores indicating more aggression. Straus (1979) found Cronbach’s Alpha reliability of 0.80 for verbal aggression and 0.83 for physical aggression scales.

Peer Relationships. A modification of The People In My Life Scale, which is based on both the Inventory of Peer Attachment (Armsden & Greenberg, 1987) and the Network of Relationships Inventory (Furman & Buhrmester, 1985), was used to assess the quality of relationship with close friends. Participants were asked indicate how much they agreed with each statement about their same sex friend (such as “I feel sure that this relationship with my best friend will last no matter what.”). Responses ranged from “almost never true” to “almost always true”. Higher numbers indicated positive reports about same-sex friendships. Previous studies indicate psychometric properties with reliabilities between 0.75-0.79 for participants’ relationships with friends (reference.
Parental Discipline. Four items were used to create the Parental Discipline scale. Participants were asked to indicate for each parent how strict and how aggressive they were in their discipline. Participants were provided three response options (easy going, slightly strict, and very strict) and higher scores indicated reports of more strict forms of discipline. Responses for the latter two items ranged from “no” to “yes, all of the time”, with higher scores indicating a greater frequency of aggressive discipline being reported.

Victimization & Bullying. Questions derived from a modified Bully/Victim Questionnaire (Olweus, 1993) were used to assess bullying experiences. A definition of bullying was provided which included verbal, physical, and indirect forms of bullying between children who have different degrees of power or strength, and is repeated over time. One question addressed victimization experiences: “How often have you been bullied at school in the past two of months?” One question about experiences of bullying others was asked, “How often have you taken part in bullying another student(s) at school in the past two of months?” Responses for the questions about being bullied or bullying others in the past couple of months ranged from “I haven’t …” to “Several times a week”. Students responded to the question on being bullied or bullying others using a five-point scale for both questions, with higher numbers representing higher frequencies.

Procedure

Participants were tested in groups in their classrooms during class time. Testing was done over three sessions of approximately one half-hour each. Upon completion of the survey or withdrawal from the study, participants received five dollars remuneration for their time.
Results

Approximately half of the sample reported having a dating partner in the last six months at Time 3 (N=439) and of that sample, 44% were male and 56% were female. Of the total participants who reported having a dating partner, 427 (97%) provided data on dating violence perpetration and victimization at Time 3. At Time 3, the participants were in grades eleven through thirteen and 15 to 19 years old (M=16.92, SD=.82). Sixteen percent of the participants reported involvement in physical dating violence perpetration and 19% in physical dating victimization. Rates of indirect dating violence were much higher with 73% reporting indirect dating violence perpetration and 63% reporting indirect forms of victimization. Finally, the results indicate that 42% of the sample reported bullying others one year earlier, whereas 25% reported being the victim of bullying one year earlier1.

Analytic Strategy

Scale Confirmation. An exploratory factor analysis was conducted, using the entire sample, in order to determine the factor structure for each scale using Time 1 data. Factors were extracted using Maximum Likelihood estimation and a direct oblimin rotation was used to enhance the interpretability of the solution produced. The number of factors to be extracted was determined using approaches recommended by Fabrigar, MacCallam, Wegener, and Strahan (1999): scree test of eigenvalues from the reduced correlation matrix; assessment of the relative improvement in model fit using Root Mean Square Error of Approximation (RMSEA); parallel analysis for eigenvalues from the reduced correlation matrix; and conceptual interpretability.

1 Preliminary analysis indicated that bullying led to increased likelihood of having a dating partner one year later, whereas victimization did not significantly predict reports of involvement in dating one year later.
Each scale was then examined using data from Time 3. A confirmatory factor analysis using Maximum Likelihood estimation and items were allowed to correlate and have uncorrelated unique variance, was conducted for each scale. The following fit indices were used to evaluate each scale: RMSEA, Incremental Fit Index, and standardized RMR as recommended by Bentler, Dudgeon, 1996 and Hu & Bentler (1998). See Tables 1-3 for the results of the Exploratory Factor Analysis for the Dating Violence and Contextual scales\(^1\).

**Tests of Moderation.** Through a series of multiple regressions\(^2\), bullying, victimization, and sex were tested as moderators of the association between the contextual factors (harsh parental discipline and friendship quality) and dating violence (victimization and perpetration). Moderation was examined by creating interaction terms whereby each moderator (i.e., bullying) was multiplied by each contextual factor (i.e., harsh parental discipline). Before conducting regression analysis, participant’s scores on all of the contextual scales, dating violence scales, and scores on bullying and victimization items were centered. By centering the data, we can minimize the problems associated with multicollinearity between the main effects and their interaction terms (Aiken & West, 1991). Moderation was indicated when the interaction terms were significant. When there was a significant interaction, simple slopes analyses were conducted as recommended by West and Aiken (2003).

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\(^1\) Verbal dating violence victimization and perpetration were dropped due to low factor loadings.

\(^2\) An attempt was made to use Structural Equation Modelling using Lisrel 8.52 for the present analysis. Unfortunately, due to small cell sizes for victimized and bullying youth reporting a romantic relationship in the last 6 months at Time 3, a more simplified model needed to be employed. Since regression analysis did not require that groups be created based on involvement in bullying, the sample size was adequate for the regression analysis.
Table 1

*Means, standard deviations, and factor loadings for items in Dating Violence Victimization*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indirect (alpha=.85)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Tried to make me jealous</td>
<td>1.55</td>
<td>1.50</td>
<td>1.25</td>
</tr>
<tr>
<td>6. Won’t invite me if mad at me</td>
<td>1.05</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>7. Threatened to break up to get what they want</td>
<td>1.25</td>
<td>1.20</td>
<td>1.15</td>
</tr>
<tr>
<td>8. Doesn’t pay attention to me when mad at me</td>
<td>1.76</td>
<td>1.70</td>
<td>1.65</td>
</tr>
<tr>
<td>9. Ignores me until I give in</td>
<td>1.41</td>
<td>1.36</td>
<td>1.30</td>
</tr>
<tr>
<td><strong>Physical (alpha=.92)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Push, grab, shove</td>
<td>1.90</td>
<td>1.80</td>
<td>1.70</td>
</tr>
<tr>
<td>2. Spit</td>
<td>1.10</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>3. Pull hair and scratch</td>
<td>1.15</td>
<td>1.10</td>
<td>1.05</td>
</tr>
<tr>
<td>4. Slap, kick or bite</td>
<td>1.15</td>
<td>1.10</td>
<td>1.05</td>
</tr>
<tr>
<td>5. Physically twisting</td>
<td>1.20</td>
<td>1.10</td>
<td>1.05</td>
</tr>
<tr>
<td>6. Throwing, smashing, hitting, or kicking an object</td>
<td>1.20</td>
<td>1.10</td>
<td>1.05</td>
</tr>
<tr>
<td>7. Slamming or holding against a wall</td>
<td>1.10</td>
<td>1.00</td>
<td>0.90</td>
</tr>
<tr>
<td>8. Hitting or trying to hit with an object</td>
<td>1.10</td>
<td>1.00</td>
<td>0.90</td>
</tr>
<tr>
<td>9. Choking, punching, or beating during an argument</td>
<td>1.10</td>
<td>1.00</td>
<td>0.90</td>
</tr>
</tbody>
</table>

RMSEA =.06 (N=1177)
<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect (alpha=.74)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Threatened to break up to get what wanted</td>
<td>1.17</td>
<td>.52</td>
<td>.33</td>
</tr>
<tr>
<td>2. Tried to make jealous</td>
<td>1.56</td>
<td>.85</td>
<td>.86</td>
</tr>
<tr>
<td>3. Cheated when angry</td>
<td>1.21</td>
<td>.60</td>
<td>.49</td>
</tr>
<tr>
<td>4. Gave silent treatment when feeling hurt</td>
<td>1.93</td>
<td>.98</td>
<td>.54</td>
</tr>
<tr>
<td>5. If mad, flirted with others in front of them</td>
<td>1.45</td>
<td>.85</td>
<td>.75</td>
</tr>
<tr>
<td>Physical (alpha=.92)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Push, grab, shove</td>
<td>1.30</td>
<td>.70</td>
<td>.57</td>
</tr>
<tr>
<td>11. Spit</td>
<td>1.11</td>
<td>.46</td>
<td>.57</td>
</tr>
<tr>
<td>12. Pull hair and scratch</td>
<td>1.11</td>
<td>.50</td>
<td>.72</td>
</tr>
<tr>
<td>13. Slap, kick or bite</td>
<td>1.19</td>
<td>.62</td>
<td>.76</td>
</tr>
<tr>
<td>14. Physically twisting</td>
<td>1.12</td>
<td>.48</td>
<td>.76</td>
</tr>
<tr>
<td>15. Throwing, smashing, hitting, or kicking an object</td>
<td>1.18</td>
<td>.56</td>
<td>.68</td>
</tr>
<tr>
<td>16. Slamming or holding against a wall</td>
<td>1.11</td>
<td>.46</td>
<td>.82</td>
</tr>
<tr>
<td>17. Hitting or trying to hit with an object</td>
<td>1.11</td>
<td>.47</td>
<td>.75</td>
</tr>
<tr>
<td>18. Choking, punching, or beating during an argument</td>
<td>1.08</td>
<td>.41</td>
<td>.60</td>
</tr>
</tbody>
</table>

Table 2

Means, standard deviations, and factor loadings for items in Dating Violence Perpetration

RMSEA=.08 (N=1132)
Table 3

*Means, standard deviations, and factor loadings for items included in each latent factor* (N=1445)

<table>
<thead>
<tr>
<th>Friendship Factors (RMSEA=.04)</th>
<th>M</th>
<th>SD</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conflict (alpha=.88)</td>
<td>.61</td>
<td>.29</td>
<td>.74</td>
</tr>
<tr>
<td>6. My best friend and I get on each others’ nerves.</td>
<td>.61</td>
<td>.29</td>
<td>.74</td>
</tr>
<tr>
<td>7. I get upset or mad at my best friend.</td>
<td>.64</td>
<td>.28</td>
<td>.72</td>
</tr>
<tr>
<td>8. My best friend and I disagree and quarrel.</td>
<td>.60</td>
<td>.29</td>
<td>.74</td>
</tr>
<tr>
<td>9. My best friend and I get annoyed with each other.</td>
<td>.64</td>
<td>.29</td>
<td>.77</td>
</tr>
<tr>
<td>10. My best friend and I argue with each other.</td>
<td>.61</td>
<td>.30</td>
<td>.80</td>
</tr>
<tr>
<td>11. My best friend and I hassle or nag one another.</td>
<td>.65</td>
<td>.32</td>
<td>.69</td>
</tr>
<tr>
<td>Time Spent with Friends (alpha=.74)</td>
<td>.70</td>
<td>.25</td>
<td>.67</td>
</tr>
<tr>
<td>5. I spend free time with my best friend.</td>
<td>.70</td>
<td>.25</td>
<td>.67</td>
</tr>
<tr>
<td>6. I play around and have fun with my best friend.</td>
<td>.77</td>
<td>.26</td>
<td>.49</td>
</tr>
<tr>
<td>7. I go places and do enjoyable things with my best friend.</td>
<td>.74</td>
<td>.28</td>
<td>.82</td>
</tr>
<tr>
<td>Intimacy (alpha=.88)</td>
<td>.67</td>
<td>.32</td>
<td>-.76</td>
</tr>
<tr>
<td>5. I tell my best friend everything.</td>
<td>.67</td>
<td>.32</td>
<td>-.76</td>
</tr>
<tr>
<td>6. I share my secrets and private feelings with my best friend.</td>
<td>.63</td>
<td>.34</td>
<td>-.94</td>
</tr>
<tr>
<td>7. I talk to my best friend about things I don’t want others to know.</td>
<td>.70</td>
<td>.32</td>
<td>-.80</td>
</tr>
<tr>
<td>Endurance (alpha=.79)</td>
<td>.74</td>
<td>.27</td>
<td>.85</td>
</tr>
<tr>
<td>6. I feel sure that this relationship with my best friend will last no matter what.</td>
<td>.74</td>
<td>.27</td>
<td>.85</td>
</tr>
<tr>
<td>7. I feel sure that this relationship will last in spite of fights.</td>
<td>.75</td>
<td>.28</td>
<td>.57</td>
</tr>
<tr>
<td>8. I feel sure that this relationship with my best friend will continue in years to come.</td>
<td>.79</td>
<td>.25</td>
<td>.60</td>
</tr>
<tr>
<td>Parent Factor (RMSEA = .06)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harsh Parental Discipline (alpha=.47)</td>
<td>.44</td>
<td>.30</td>
<td>.48</td>
</tr>
<tr>
<td>7. Mother’s way of discipline (easy going, strict, very strict).</td>
<td>.44</td>
<td>.30</td>
<td>.48</td>
</tr>
<tr>
<td>8. Father’s way of discipline (easy going, strict, very strict).</td>
<td>.50</td>
<td>.34</td>
<td>.49</td>
</tr>
<tr>
<td>9. Were you spanked while you were growing up?</td>
<td>.31</td>
<td>.26</td>
<td>.47</td>
</tr>
</tbody>
</table>
Dating Violence Peretration

Our first question was whether sex and bullying at Time 2 moderated the link between parent and friend factors at Time 1 and dating violence perpetration at Time 3. We conducted two regressions for the indirect and physical forms of dating violence perpetration. To predict dating violence perpetration at Time 3, we entered into the regressions: (a) main effects of sex, parental discipline at Time 1; quality of friendships at Time 1 (four factors); reports of bullying others in the last two months at Time 2; reports of being bullied in the last two months at Time 2; and the interaction terms for bullying, victimization, and sex by all of the friendship and parental discipline variables. The results are summarized in Table 4.

Indirect Dating Violence Perpetration. Bullying and being a girl significantly predicted increased levels of indirect perpetration and time with friends predicted decreased indirect perpetration. As well, a significant Bullying by Friendship Intimacy interaction was found in the prediction of indirect perpetration. The association between Friendship Intimacy and Indirect Perpetration was significant at low levels of bullying only (B = .11, p<.01) and not high levels (B = -.05, ns). Hence, at low levels of bullying, higher friendship intimacy scores were associated with increased indirect perpetration.

Physical Forms of Dating Violence Perpetration. Bullying was a significant predictor of increased physical dating violence perpetration one year later. Significant Bullying by Friendship Endurance and Bullying by Friendship Intimacy interactions were also found in the prediction of physical perpetration. Inspection of the regression slopes

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1 Since the physical dating violence perpetration score had a skewed distribution, the regressions were repeated using the transformed (reciprocal) score. Scores that were significant with the centered score remained significant when using the transformed score.
Table 4

**Moderator between Contextual Variables and Dating Violence Perpetration**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Indirect Perpetration</th>
<th>Physical Perpetration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R=.14, (N=427)</td>
<td>R=.10, (N=424)</td>
</tr>
<tr>
<td></td>
<td>B¹</td>
<td>T</td>
</tr>
<tr>
<td>Victimization</td>
<td>-.01</td>
<td>-.66</td>
</tr>
<tr>
<td>Bullying</td>
<td>.04</td>
<td>6.74***</td>
</tr>
<tr>
<td>Gender</td>
<td>.01</td>
<td>2.24*</td>
</tr>
<tr>
<td>Friend Endurance</td>
<td>-.03</td>
<td>-1.11</td>
</tr>
<tr>
<td>Friend Intimacy</td>
<td>.03</td>
<td>1.14</td>
</tr>
<tr>
<td>Conflict with Friends</td>
<td>.02</td>
<td>.84</td>
</tr>
<tr>
<td>Time with Friends</td>
<td>-.10</td>
<td>-3.00**</td>
</tr>
<tr>
<td>Harsh Parental Discipline</td>
<td>-.02</td>
<td>-9.3</td>
</tr>
<tr>
<td>Victim X Endurance</td>
<td>-.02</td>
<td>-.57</td>
</tr>
<tr>
<td>Victim X Intimacy</td>
<td>-.04</td>
<td>-1.35</td>
</tr>
<tr>
<td>Victim X Conflict</td>
<td>.04</td>
<td>1.31</td>
</tr>
<tr>
<td>Victim X Time</td>
<td>.01</td>
<td>.25</td>
</tr>
<tr>
<td>Victim X Discipline</td>
<td>-.02</td>
<td>-6.9</td>
</tr>
<tr>
<td>Bullying X Endurance</td>
<td>-.07</td>
<td>-1.82</td>
</tr>
<tr>
<td>Bullying X Intimacy</td>
<td>.09</td>
<td>3.27**</td>
</tr>
<tr>
<td>Bullying X Conflict</td>
<td>-.04</td>
<td>-1.58</td>
</tr>
<tr>
<td>Bullying X Time</td>
<td>-.05</td>
<td>-1.37</td>
</tr>
<tr>
<td>Bullying X Discipline</td>
<td>.01</td>
<td>.20</td>
</tr>
<tr>
<td>Gender X Endurance</td>
<td>.01</td>
<td>.47</td>
</tr>
<tr>
<td>Gender X Intimacy</td>
<td>-.03</td>
<td>-1.08</td>
</tr>
<tr>
<td>Gender X Conflict</td>
<td>.01</td>
<td>-.53</td>
</tr>
<tr>
<td>Gender X Time</td>
<td>.05</td>
<td>1.56</td>
</tr>
<tr>
<td>Gender X Discipline</td>
<td>.01</td>
<td>.48</td>
</tr>
</tbody>
</table>

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

¹ Unstandardized coefficients
² Unstandardized coefficients
indicated that friendship endurance was negatively associated with physical perpetration at low levels of bullying (B = -.06, p<.05) and no association was found at high levels (B = .04, ns). In other words, at low levels of bullying, higher friendship endurance was associated with decreased physical perpetration. There was a negative association between friendship intimacy and physical perpetration at low levels of bullying (B = .04, p<.05) but not at high levels (B = -.03, ns), indicating that at lower levels of bullying, higher intimacy was associated with increased physical perpetration.

**Dating Violence Victimization**

Our second question was to determine whether sex and bullying at Time 2 moderated the link between parent and friend factors at Time 1 and dating violence victimization at Time 3. We conducted two regressions for indirect and physical forms of dating violence victimization. To predict dating violence victimization at Time 3, we entered into the regressions: (a) main effects of sex, parental discipline at Time 1, quality of friendships at Time 1 (four factors), reports of bullying others in the last two months at Time 2, reports of being bullied in the last two months at Time 2; and the interaction terms for bullying, victimization, and sex by all of the friendship and parental discipline variables. The results are summarized in Table 5.

**Indirect Dating Violence Victimization.** Bullying and conflict with friends predicted increased indirect dating violence victimization. As well, a significant Bullying by Time with Friends interaction was found in the prediction of Indirect Dating Violence Victimization. Time with friends was significantly associated with indirect forms of victimization at low levels of bullying (B = -.15, p<.05). No significant association was found between time with friends and indirect victimization at high levels of bullying.
Table 5

**Moderator between Contextual Variables and Dating Violence Victimization**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Indirect Victimization R=.10, (N=427)</th>
<th>Physical Victimization R=.14, (N=425)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B¹</td>
<td>T</td>
</tr>
<tr>
<td><strong>Victimization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.01</td>
<td>.60</td>
<td>.00</td>
</tr>
<tr>
<td><strong>Bullying</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.03</td>
<td>4.58***</td>
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* p<.05 ** p<.01, *** p<.001

1 Unstandardized coefficients
2 Unstandardized coefficients
Thus, at low levels of bullying, increased time with friends was associated with decreased indirect victimization.

As well, a significant Sex by Conflict with Friends interaction was found in the prediction of Indirect Victimization. Post hoc analysis indicated that increased conflict with friends was associated with increased indirect victimization in boys only (B = .14, p < .05); the association was not significant for girls (B = -.02, ns).

Physical Forms of Dating Violence Victimization. Bullying significantly predicted increased reports of physical dating violence victimization one year later. Significant Bullying by Friendship Endurance and Bullying by Friendship Intimacy interactions were found in the prediction of Physical forms of Dating Violence Victimization. Friendship endurance was negatively associated with physical victimization at low levels of bullying only (B = -.07, p < .05) and not high levels (B = .04, ns). Conversely, for friendship intimacy, there was a positive association with physical victimization at low levels only (B = .06, p < .01), with no significant association at high levels (B = -.03, ns). Hence, at low levels of bullying, increased friendship endurance was associated with decreased physical victimization, whereas increased friendship intimacy was associated with increased physical victimization.

As well, a significant Peer Victimization by Harsh Parental Discipline interaction was found in the prediction of Physical forms of Dating Violence Victimization. Higher harsh discipline was associated with increased physical victimization at low levels of peer victimization (B = .05, p < .05) but not high levels (B = -.03, ns).

\(^1\) Since the physical dating violence victimization score had a skewed distribution, the regressions were repeated using the transformed (reciprocal) score. Scores that were significant with the centered score remained significant when using the transformed score.
Finally, there was a significant Sex by Time with Friends interaction for the prediction of Physical Victimization. Post hoc analysis indicated that higher amounts of time with friends was associated with decreased physical victimization in boys only (B= -.10, p<.05) No significant association was found between time with friends and physical victimization for girls (B= .00, ns).

Discussion

The results of the present study suggest that bullying others is a risk factor for dating violence victimization and perpetration. These results provide support for previous studies, which indicate that bullying and dating violence behaviours co-occur in young adolescents (Connolly et al., 2000). Our findings extend this line of research by indicating that bullying others predicted future dating violence involvement in later adolescence. The present study also sought to examine the moderating influence of involvement in bullying on dating violence. We speculated that relational difficulties in the peer environment would alter the influence of parental and peer factors. Involvement in bullying did moderate the influence of environmental factors, as did victimization, but to a lesser extent. Our findings provide important implications for dating violence prevention programs.

Bullying and Dating Violence

Consistent with previous studies, our reports indicate that a significant number of youth are experiencing dating violence. As well, our reports suggest that bullying others predicts future involvement in dating violence. These findings provide important information to prevention programs, suggesting that aggression in peer relationships can extend into future dating relationships. Bullying youth may be so entrenched in their
aggressive behaviours that they cannot desist as they enter into romantic relationships. Because bullying youth participate in advanced dating behaviours earlier than their peers (Connolly et al., 2000), it is possible that the increased intimacy in their romantic relationships increases their vulnerability to dating violence. As youth dating violence is viewed as a risk factor for adult domestic violence, bullying may be viewed as part of the cycle of violence in which youth engage, but may also provide insight about when we can intervene. It is possible that by reducing bullying behaviours, we may be able to assist in getting youth on track for healthier adult relationships and prevent another generation from being exposed to domestic violence.

*Moderating Effects of Bullying*

A secondary goal of the present study was to examine the moderating effects of bullying, victimization, and sex. We hypothesized that reports of bullying would accentuate the negative influence of harsh parental discipline and aggressive friendships, and attenuate the positive influence of secure friendship quality. Our results were contradictory, in that bullying others diminished the influence of friendship factors and victimization diminished the influence of parent factors. These findings suggest that the dating behaviours of youth who do not experience bullying are influenced by friendship factors two years earlier, but that when bullying occurs, these friendship factors are no longer significant. There may be several reasons to explain the attenuation of friendship influence in bullying youth. For instance, it is possible that bullying youth have more transient friendships, and as such, their friendship quality does not have meaningful influence over time. Using the theory of homophily (Hanish, Martin, Fabes, Leonard, & Herzog, 2005), the bullying youth in the present study may have sought out a new peer
network that supports their aggressive behaviours during the course of the study. Alternatively, the advanced dating behaviours of bullying youth may result in reduced peer influence (Connolly et al., 2000), as they may be spending less time with friends and more with romantic partners. Studies reveal that youth who participate in advanced dating behaviour and spend more time with romantic partners may be at risk for increased involvement in dating violence (Zimmer-Gembeck, 2002).

When we look at youth reporting low levels of bullying, our results suggest that increased friendship intimacy leads to more dating violence, whereas a greater sense of commitment and time with friends leads to decreased dating violence. Perhaps a sense of long lasting friendship and spending time with friends reduces the level of dependency youth have on their romantic partner. Zimmer-Gembeck (2002), argues that maintaining quality friendships is an important factor in developing healthy romantic relationships. Friendship security may also assist youth in rejecting violent dating relationships, as they may be less reliant on their dating partner. Contrary to our expectations, friendship intimacy, which was defined by confiding in friends, appeared to be a risk factor for dating violence victimization and perpetration. Perhaps increased peer disclosure reflects a premature dependence on peers, which is a risk factor for increased relational violence (Wekerle & Wolfe, 1999). In addition, the content of peer dialogue may have influenced involvement in dating violence. Past studies indicate that friends whose conversations are characterized by deviant talk are more likely to participate in delinquent and aggressive behaviours (Brendgen, et al., 2000). Although we did not assess the content of peer dialogue, it is plausible that increased peer disclosure focused on aggressive and deviant talk. Future studies should seek to delineate whether it is the extent of peer
disclosure or the content of the disclosure that poses a risk for involvement in dating violence.

Although victimization acted as a moderator in only one model, the influence was noteworthy. We hypothesized that victimization by peers would enhance the negative effects of harsh parental discipline, however the present study indicated otherwise. For youth reporting low levels of peer victimization, harsh parental discipline predicted involvement in dating violence victimization one year later. Parents did not influence dating violence involvement in youth who reported high levels of victimization. Given that victimized youth report having parents who model avoidant conflict patterns (Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001), it is possible that youth who are victimized by parents, and then by peers, learn to avoid dating relationships altogether. It is also possible, that after repeated victimization in multiple domains, victimized youth feel less inclined to report abusive behaviour in subsequent dating relationships. A sense of learned helpless may evolve from these earlier experiences, leading victimized youth to underreport the extent of their experiences with any form of aggression, including dating violence. Using a multi-informant approach in future studies may assist in determining whether the moderating effect of victimization was due to under reporting of later experiences with abuse.

**Sex as a Moderator**

In addition, the present study sought to determine whether sex would moderate the influence of parents and peers. In terms of dating violence victimization boys appeared to be more susceptible to the negative influence of harsh parental discipline. As well, time with friends appeared to act as a buffer against later exposure to dating
violence victimization, whereas conflict with friends seems to act as a risk factor for boys’ victimization. Together, these findings suggest that boys’ experiences with dating violence victimization are more susceptible to contextual variables in comparison to girls. In terms of prevention programs, these findings suggest that improving parent and peer relationships may be particularly important in reducing dating violence victimization in adolescent boys.

*Differences and Similarities Across Types of Dating Violence*

Few differences were found in the predictions of different types of dating violence and dating violence role (perpetration versus victimization). In fact, our results indicate that indirect and physical dating violence were both influenced by bullying, and by friendship quality in youth not engaging in bullying others. When comparing dating violence roles, we also found many similarities. In the models examining physical dating violence, the predictors and moderator effects were the same, with the exception of the moderator effects of harsh parental discipline on physical victimization. These results suggest that programs may use similar strategies to reduce both indirect and physical forms of dating violence, as well as physical victimization and perpetration. When looking at indirect forms of dating violence, there was greater variability in the predictors of victimization and perpetration. For example, being a boy predicted indirect victimization, but not indirect perpetration. As well, time with friends predicted reduced indirect victimization in non bullying youth, but was not associated with rates of indirect perpetration. Results for indirect dating violence suggest that programs target different forms of friendship quality in order to reduce perpetration and victimization.

*Limitations and Directions for Future Research*
Of course, the present study is not without limitations. Measures of bullying, environmental factors, and dating violence were based on self-reports, and consequently are subject to shared method variance problems. Studies on adolescence, however, suggest that self-report may be the most appropriate method of evaluating dating behaviours and involvement in bullying in this age group, as they are less likely to confide in parents and teachers (Baldry, 2004).

Although this self-report technique may have methodological shortcomings, our ability to access a longitudinal data set allowed us to examine the influence of earlier experiences of bullying on dating violence one year later. As well, we were able to determine if later involvement in bullying would alter the influence of risk and protective factors experienced earlier in life. The testing of this complex model provides insight for universal prevention programs and those that target aggressive and bullying youth.

Finally, the present study prompted many questions that could not be addressed. For example, few items addressed parental discipline and parent-child relationship quality, and, as a result we were not able to examine whether the gender of the parent had a differential influence on dating violence. Previous studies indicate parental influence on dating violence may vary according to gender of the child and gender of the parent (Lewis & Fremouw, 2001). As well, the sample used in the present study did not include youth who were not attending school. Hence, we had no way of examining whether the most at-risk population (i.e., those not attending school or those in alternative programs) had similar risk factors for dating violence involvement. Future studies should seek to expand on the present study, by addressing father and mother’s influence on dating violence among youth involved in bullying and involving youth who may not be
attending the regular school system. Lastly, the focus of the present study was on heterosexual dating relationships. The majority of students identified themselves as heterosexual, and thus the present findings may not be generalized to youth whom have homosexual relationships. As homosexual youth report high levels of peer victimization (Williams, Connolly, Pepler, & Craig, 2003), we recommend that future studies examine the influence of bullying on dating violence in homosexual relationships.

Conclusions

Despite these limitations, the present findings add to the literature by exploring the predictive influence of bullying behaviours on dating aggression. Taken together, the present study suggests that bullying others in earlier adolescence may be a marker for future involvement in dating violence. As well, the present study provided insight into how bullying may influence previously established risk and protective factors. Overall, these findings suggest that programs designed to reduce dating violence address involvement in bullying others, as well as how peers and parents can contribute to the reduction of dating violence in non bullying boys and girls.
References


Chapter 5:

General Discussion
General Discussion

Although adolescence is a time of transitions and increasing engagement in risky health behaviours, it also presents vast opportunities for change. In order to capitalize on these opportunities, adolescent health researchers have tried to unravel the underlying factors that contribute to positive and negative health behaviours during this developmental period. The three studies we conducted provide additional insight into the complexity of environmental factors that can influence health behaviours in youth. The studies also indicate that youth involved in bullying may be particularly vulnerable to engagement in unhealthy behaviours. Lastly, the three studies suggest that key environmental factors, which contribute to adolescent health, may have a different influence on youth involved in bullying. Together, the studies provide important insight for prevention and intervention programming.

Ecological Models

Developmental theory and Problem Behaviour Theory postulate that environmental factors make a significant contribution to health behaviours in adolescence (Cummings, Davies, & Campbell, 2000; Jessor, 1998). All three studies provide support for these theories. In the first study, feelings of connection to school and the community predicted fewer health complaints and increased physical activity among youth not involved in bullying. Study 2 also provided evidence for an ecological model of influence, as having friends who participate in risky behaviours predicted risky sexual behaviours and sexual coercion. Sexual coercion was also predicted by poor relationship with both parents. Consistent with the first two studies, Study 3 indicated that social
environment matters, as friendship quality made a significant contribution to reports of dating violence two years later.

Overall, these findings suggest that programs, which attempt to improve adolescent health, should focus on improving connections within the social ecology of youth while reducing exposure to deviant peers. Thus, we caution the use of health promotion strategies that isolate youth from the positive influence of their social environment and congregate them in high-risk groups. Our recommendations are in concert with previous studies that indicate deleterious effects when segregating high-risk youth for health promotion programs (Biglan, Brennan, Foster, & Holder, 2004; Dishion, McCord, Poulin, 1999). Rather, we suggest that health promotion strategies encourage youth to make connections within their environment with positive role models. We suggest similar strategies for youth involved in bullying.

Bullying & Victimization

In all three studies, bullying predicted increased rates of health behaviours, both positive and negative. These findings are consistent with the literature on youth violence, which indicates that engagement in violence does not preclude involvement in healthy behaviours (Zweig, Phillips, & Lindberg, 2002). Bullying others, however, also predicted increases in risky sexual behaviour and sexual coercion, and dating violence victimization and perpetration one year later. The co-existence of bullying behaviours with other risky behaviours provides support for PBT, which argues for a model of multi-problem behaviours in youth (Jessor, 1998). Hence, we suggest that health promotion strategies that focus on youth include broad programs that address healthy lifestyle choices, rather than focusing exclusively on one behaviour at a time. Various studies
draw the same conclusion about health programming, yet few programs exist that include several health areas (Biglan, et al., 2004). Many argue that the resistance to creating “lifestyle” rather than “problem-focused” programming relates to the funding formula available to prevention practitioners (Biglan, et al., 2004). Unfortunately, this pattern of programming may lead to increased spending with few results.

When we looked at victimization, we also found support for a multi-problem model, albeit to a lesser extent than bullying. In particular, Study 2 revealed a positive link between reports of victimization and risky sexual behaviours, including increased reports of sexual coercion. Only one study we reviewed included victimization when examining risky behaviours (Rusby, Forrester, Biglan, & Metzler, 2005). The study, which examined the relationship between victimization and multiple problem behaviours in mid-adolescence, indicated that victimization reported in middle school predicted increased tobacco and alcohol use in high school. Previous studies on bullying have speculated that victimization offers youth some protection from risky health behaviours (Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001). Our study on sexual health, coupled with the findings by Rusby et al., (2005), suggest that victimized youth, like the youth who bully them, may be vulnerable to increased engagement in an array of negative behaviours.

*Moderator Effects of Bullying*

Results indicated that involvement in bullying did not only predict increases in problematic behaviours, it also moderated the influence of several environmental factors in all three studies. These findings provide further information about how to design targeted health promotion strategies. Targeted programs, as opposed to universal
programs, identify and direct their prevention efforts towards specific at-risk groups (Biglan, et al., 2004). Based on our findings, adults within the community and school, and fathers played a significant role in reducing the rates of health risk behaviours associated with bullying. As well, health behaviours among youth involved in bullying appeared to be less vulnerable to the influence of peer factors.

There may be various reasons to explain the increased emphasis on adult relationships and a decreased influence of peers among this group. For instance, it is plausible that both bullying and victimized youth, who often lack the social skills to needed to negotiate engagement in healthy and unhealthy behaviours (Espelage & Swearer, 2003), may need to rely on adults to make healthier choices. Moreover, youth involved in bullying may feel less connected to their peer group, and subsequently may be less sensitive to the influence of their peers when making choices about their health. Therefore, when it comes to developing programs that target bullying and victimized youth, we suggest that the focus be on promoting positive relationships with adults, as well as providing opportunities for improved peer relationships.

*Analytic Strategy*

Each of the three studies provided analytic advances in examining the influence of bullying on adolescent health. For example, the advantage of analyzing large and comprehensive data sets in the first two studies allowed for the evaluation of complex moderator models through multi-sample analysis using Structural Equation Modelling (SEM). As stated in the outset of this paper, there are many advantages of using SEM analysis to examine moderator models, which include the ability to assess model fit when more than one variable is used to measure a construct (Holmbeck, 1997). As well, in
Studies 1 and 2, we were able to assess whether the measurement model used to test moderation was similar regardless of bullying involvement or sex of participants. When we compared the model fit for physical activity across groups who were victimized and those not involved in bullying, the results indicated the model improved significantly when the physical activity factor was split into in-school and out-of-school activity. Consequently, we were able to detect the moderating effects of victimization on in-school activity, which may not have been detected if we had not split the physical activity factor. In Study 2, our results indicated that the model fit improved significantly when the mother and father factors were examined in separate models. Had we not run the model comparisons across the different groups, we may have included both parent factors in one model, and possibly not have detected the moderating effects of bullying on father relationship.

In the last study, the longitudinal design permitted the evaluation of the moderator effects of bullying over time. Hence, we were able to examine the influence of earlier experiences of bullying on dating violence one year later. As most studies do not examine the moderating influence of bullying over time, our study also provided insight about how involvement in bullying could alter the influence of risk and protective factors, experienced earlier in life, on dating aggression reported one year later. The testing of these complex models in all three studies provides insight for universal prevention programs and those that target bullying and victimized youth.

Summary

Taken as a whole, these studies have important implications for bullying prevention and intervention strategies (Canadian Initiative for the Prevention of Bullying,
2007), which include policy and advocacy, education and awareness, assessment, and intervention and evaluation. In terms of policy and advocacy, we propose that policies should provide practice recommendations about the need for screening and intervening in health difficulties associated with bullying. Policy initiatives should also target funding agencies so that a broad array of health behaviours can be included in prevention and promotion strategies. Finally, policy changes should include education and awareness campaigns for the public as a whole, as well as for those directly involved in the care of youth, including educators, medical professionals, counselors, and community agencies. Education efforts should also target youth and their families, in order to help them identify, and potentially change, the connection with their own bullying experiences and problematic health habits. Assessment and intervention are also integral components of any health promotion strategy.

Along the lines of our policy recommendations, we suggest that youth who present with difficulties around bullying also be screened for other health problems. These screenings could provide important information for educators and medical professionals about how to reduce risk behaviours and prevent engagement in future risky behaviours. As well, assessment tools could be used to monitor and evaluate changes in bullying and health behaviours that are related to policy, education, and intervention programming. Lastly, we highly recommend the creation of intervention strategies for youth who are already involved in bullying that include a focus on healthy lifestyle choices. These bullying programs need to include discussions about risky health behaviours and provide opportunities for increased connections with supportive adults in their environment. Consequently, evaluation and monitoring of these bullying programs
should include assessment of changes in physical health behaviours, as well as changes in bullying behaviours.

In summary, the three studies included in this paper, both individually and collectively, indicate that involvement in bullying may be a risk factor for engagement in unhealthy behaviours during adolescence. The findings also suggest that parents, schools, and communities can play an important role in reducing health difficulties that youth involved in bullying may experience. Given the opportunity to change and shape health behaviours during adolescence, it will be important for future public health campaigns to consider the influence of bullying, as well as the complexity of environmental factors that can affect health, when developing strategies to promote health in youth.
References


