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Developmental trajectories of adolescent victimization: predictors and outcomes

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Abstract

Chronic victimization negatively affects mental health making it crucial to understand the key predictive social health (e.g., loneliness, isolation) factors. Evidence suggests that the effects of victimization are worse over the transition from primary to secondary school. Longitudinal data from 1,810 students transitioning were used to identify victimization trajectory groups; classified as low increasing, low stable, medium stable and not bullied. Adolescents with poorer social health were more likely to be in the increasing and stable victimized group than in the not bullied group. Students in the low increasing victimized group had poorer mental health outcomes than those in the stable and not bullied groups. The results of this study have important implications for the type and timing of school-based interventions aimed at reducing victimization and the harms caused by long-term exposure.

Keywords: anxiety, connectedness, depression, loneliness, peer support, safety, victimization

School bullying, defined as a type of repeated aggressive behaviour involving the systematic abuse of power through unjustified acts intended to inflict harm (Smith, 2004), has a traumatic impact on all involved regardless of role (perpetrators, victims, bully-victims, or bystanders), with the level of trauma related to frequency of exposure (Carney, 2008). Exposure to chronic victimization can lead to traumatic reactions which may result in greater expressed physical, psychological and emotional symptoms (Garbarino, 2001), which in turn, may contribute to lasting long-term effects (Carney, 2008). Stress from physical and verbal bullying has been found to elevate the levels of cortisol and may impact adolescent long-term mental health and memory functioning, affecting school achievement (Vaillancourt et al., 2011). Many students who are chronically victimized throughout school are maladjusted (Rosen et al., 2009), suffer stress later in life (Newman, Holden, & Delville, 2005), and are bullied as adults (Smith, Singer, Hoel, & Cooper, 2003). Genetic differences may result in some frequently bullied children more vulnerable to the emotional effects of bullying victimization than others (Sugden et al., 2010). Bond and colleagues (2001) reported that victimization rates were generally high (approximately 50%) and stable with two-thirds of adolescents who were frequently victimized one year later. A more recent Australian study found approximately one-quarter of adolescents are victimized every few weeks or more often (Cross et al., 2009).

Given the high prevalence of chronic adolescent victimization and the associated consequences, it is important to understand the developmental pathways of victimization. In adolescence, victimization decreases from a high following the transition from primary to secondary school to lower levels at the end of secondary

school with the development of social understanding, shifting norms against specific types of victimization (Nansel et al., 2001), and the priority of popularity (LaFontana & Cillessen, 2010) in the peer group. The use of victimization trajectories allows the longitudinal examination of victimization, revealing those who are chronically victimized as well as associated predictors and outcomes of victimization trajectories. Previous longitudinal studies, focused on primary school (children Grade 3 through to Grade 7) victimization trajectory analyses (Boivin, Petitclerc, Feng, & Barker, 2010; Goldbaum, Craig, Pepler, & Connolly, 2003), found approximately 80% of students followed a low or non-victim trajectory, with the remainder of victims following stable, increasing or decreasing victimization trajectories over time. Data in these studies were collected over a four-year and three-year time period respectively. Gender differences in the number and shape of victimization trajectories are expected due to the type of victimization experienced by males and females (males are more likely to experience physical victimization; females covert relational victimization (Pepler, Jiang, Craig, & Connolly, 2008)) and the higher prevalence of victimization reported by males over females during the transition from primary to secondary school (Cross et al., 2009).

This study examined developmental victimization trajectories of students from the end of primary school (Grade 7 – age 12) to the end of the second year of secondary school (Grade 9 – age 14). Among Australian students, an increase in bullying behaviour appears to occur around age 11 and immediately following the transition from primary school to secondary school (Cross et al., 2009). This increase in bullying behaviours may be due to a combination of factors including greater academic competition, teachers' poorer attitudes towards bullying, a reduced sense of a positive school ethos

in secondary schools relative to primary schools, and a peak in social aggression(Pellegrini, 2002; Pellegrini & Bartini, 2000; Underwood, Beron, & Rosen, 2009). Adolescence coincides with the transition from primary to secondary school contributing to a major change in social structure, with students often needing to develop new friendships and define their place in a new social hierarchy (Pellegrini & Bartini, 2000).

It has been demonstrated that victimized students possess ineffective coping skills in both information processing and social behaviour domains (Smith, Talamelli, Cowie, Naylor, & Chauhan, 2004). Poor coping skills have been found to lead to increased stress levels, which have an impact on mental health (Aldwin, 2011). Consistently, the stress-coping model, which proposes that victimized students are more likely to exhibit psychological distress if they feel unsupported, can illuminate the mental health impact of victimization (Cassidy & Taylor, 2005). Social health (i.e., the ability to get along with others, dealing with social institutions and societal mores) is associated with a greater capacity to cope with social problems (e.g., bullying). Importantly, being socially healthy can be protective against victimization over the transition period. Consistently, Lester, Cross, Dooley and Shaw (2012a) found significant reciprocal causal pathways between social health factors and victimization over the transition period, with students feeling a greater connectedness to school, feeling more safe at school and having greater peer support reporting less victimization. Alternatively, students feeling less connectedness to school, feeling less safe at school, feeling more lonely and having less peer support reported greater victimization. This study focused on the Grade 7 social health factors (i.e. feeling less lonely at school, connectedness to school, peer

support and feeling safe at school) that predict membership to victimisation trajectory groups. This study focused on the Grade 7 social health factors (i.e. loneliness at school, connectedness to school, peer support and feeling safe at school) that predict membership to victimization trajectory groups. Importantly, the social health factors investigated in this study are all amenable to school intervention (Libbey, 2004; Menesini et al., 2003; Naylor & Cowie, 1999).

Researchers have found bullying victimization to be longitudinally associated with depression (Bond, Carlin, Thomas, Rubin, & Patton, 2001; Hawker & Boulton, 2000; Kaltiala-Heino, Rimpela, Rantanen, & Rimpela, 2000; Lester, Cross, Dooley, & Shaw, 2012b; O'Brennan, Bradshaw, & Sawyer, 2009; Roland, 2002; Sweeting, Young, West, & Der, 2006; Ybarra, 2004), anxiety (Kaltiala-Heino et al., 2000; Lester et al., 2012b; Salmon, James, & Smith, 1998), psychosomatic complaints (Fekkes, Pijpers, & Verloove-Vanhorick, 2004; Kaltiala-Heino et al., 2000) and suicidal ideation (Kaltiala-Heino, Rimpela, Marttunen, Rimpela, & Rantanen, 1999; Rigby & Slee, 1999; Salmon, James, Cassidy, & Javaloyes, 2000). Persistent victimization is a strong predictor of the onset of depression and anxiety (Bond et al., 2001) with those chronically victimized showing more negative effects (Menesini, 2009) than those only recently victimized. In this study, the mental health outcomes of adolescents in the different victimization trajectory groups will be compared.

Hence, this paper aims to use longitudinal data to model the developmental trajectories of victimization during and following the transition from primary to secondary school and to determine the existence of gender differences in the shape and number of trajectory

paths. The social health predictors of trajectory group membership will also be explored with poorer social health at the end of primary school (Grade 7) expected to be associated with chronic victimization group membership. Those in chronic victimization trajectories are also expected to have poorer mental health outcomes in secondary school (Grade 9) than those in low or non-victim trajectories.

Methods

The data in this study were taken from a larger longitudinal study, the Supportive Schools Project (SSP) conducted in Perth, Western Australia, which aimed to enhance the capacity of secondary schools to implement a whole-of-school bullying reduction intervention. Data from only the study comparison schools have been used as the intervention is not a focus of this paper. The study was approved by the Edith Cowan University Human Research Ethics Committee and the relevant school authorities.

Sampling and data collection

To reduce the rate of transition attrition as students move from primary to secondary schools, secondary schools affiliated with the Catholic Education Office (CEO) of Western Australia were recruited to participate in the study. Students within Australian Catholic schools are more likely than students attending schools in other sectors (e.g., government schools) to move from primary to secondary schools in intact groups. Cohort data were collected during the Supportive Schools Project (SSP) from 3,462 students from 21 of the 28 Catholic secondary schools in Western Australia. The seven schools that declined to participate cited other priorities within their school and

demanding staff workloads. All CEO schools were stratified according to the total number of students enrolled at the school and each school's Socio-Economic Status (SES) and were randomly selected and randomly assigned to an intervention or comparison group (Cross, Hall, Waters, & Hamilton, 2008).

Data used in this paper were collected from students assigned to comparison schools in four waves from 2005 to 2007. To collect data relating to pre-transition experience, all Grade 7 students enrolled to commence in Grade 8 at each of the 21 participating secondary schools received a baseline survey while in Grade 7 at their respective primary schools. Parents of Grade 8 students at the 21 secondary schools, who had not been recruited in Grade 7 as they were not on the school enrolment lists, were approached for consent for their child's participation at the first follow-up.

The student cohort was surveyed at the end of Grade 7 (mean age 12 years), the beginning and end of Grade 8 (mean age 13 years old) and the end of Grade 9 (mean age 14 years old). In total, 3,462 (92% of the total recruited) students completed questionnaires at least at one time point with 3,123 (90%) responding to at least three of the four data collection points. One half of the students surveyed were male and 70% attended a co-educational secondary school versus a single sex secondary school. Responses from only the students from the SSP study comparison schools were used in the analysis detailed below.

All schools involved in the study had specific written bullying policies. School administrators, pastoral care staff and some teachers typically contributed to the development and writing of their school's bullying prevention and management

component of the school's behaviour management plan. The bullying prevention and management policies typically covered a definition of bullying, the school's position and response in relation to bullying, the management of bullying incidents, and rights and responsibilities of the whole school community.

Active consent (where parents gave written permission for their child to participate) was requested from all parents, if any parents did not respond to this active consent approach up to two follow-up letters were sent to parents requesting their passive consent where they were required to opt-out if they did not wish their child to participate (Ellickson & Hawes, 1989). This two layered consent process resulted in ninety-three percent of parents whose children were enrolled in the 21 recruited secondary schools consenting to their child participating in the study.

Measures

Victimization: To assess physical, relational and verbal victimization, a seven item categorical index adapted from items/scales developed by Rigby and Slee (Rigby & Slee, 1998) and Olweus (Olweus, 1996) was used. The items assessed physical (hit, kicked and pushed around; had money or other things broken or taken away from them; made to feel afraid they would get hurt), verbal (made fun of and teased in a hurtful way; called mean and hurtful names), and relational (students ignored them, didn't let them join in, or left them out on purpose; students told lies about them and tried to make other students not like them) bullying during the current term (10 weeks) at school. Students were asked how often they were bullied and rated each item on a 5-point

scale (1=ever, 2=once or twice, 3=every few weeks, 4=about once a week, 5=most days). A definition of bullying, supported by illustrations of the behaviors, was provided in the questionnaire. Confirmatory factor analysis performed on the victimization scale confirmed its unidimensionality (CFI >0.9, SMR<0.10 at all time points). A victimization score was calculated at each time point for each student by averaging the seven items with a higher score reflecting more experiences of victimization (average alpha = 0.86).

Peer Support: The peer support at school scale (adapted from the 24-item Perceptions of Peer Social Support Scale (Ladd, Kochenderfer, & Coleman, 1996); comprised eleven items (How often would students: choose you on their team; tell you you're good at things; explain something if you didn't understand; invite you to do things with them; help you if you are hurt; miss you if you weren't at school; help you if something is bothering you; ask to work with you; help you if other students treat you badly; ask you to join in when alone; and share things with you?) measured on a three-point scale (1=never, 2=sometimes, 3=lots of times). A factor analysis performed on the adapted peer support scale confirmed its unidimensionality (CFI >0.9, SMR<0.10 at all time points). A peer support score at each time point was calculated for each student by averaging all items, higher scores reflecting greater feelings of peer support (average alpha=0.88).

Loneliness: Loneliness was measured using seven items adapted from Cassidy and Asher's 15 item loneliness at school scale (J. Cassidy & Asher, 1992). The seven items (I feel alone at school; I have lots of friends to talk to at school; It's hard for me to make

friends at school; I have nobody to talk to in my classes; I don't have anyone to spend time with at school; I'm lonely at school; I feel left out of things at school) were measured on a five-point scale ranging from strongly disagree to strongly agree. Confirmatory factor analysis confirmed the unidimensionality of the scale (CFI >0.9, SMR<0.10 at all time points). A mean loneliness score was calculated at each time point for each student, with higher scores reflected greater feelings of loneliness (average alpha=0.72).

Connectedness: The connectedness to school scale comprised four items adapted from the Resnick and McNeely (1997) six item School Connectedness Scale (I feel close to people at school; I feel like I am part of this school; I am happy to be at school; the teachers treat students fairly) measured on a five-point scale (1=unsure, 2=never, 3=sometimes, 4=usually, 5=always). Unidimensionality was confirmed through factor analysis (CFI >0.9, SMR<0.10 at all time points). For each student at each time point an average school connectedness score was calculated, with a higher score reflecting greater feelings of connectedness (average alpha=0.80).

Safety: Safety at school was a single item adapted from the Rigby and Slee's Peer Relations Questionnaire (1998) and measured on a three-point scale (1=No, I never feel safe at school, 2=Yes, some of the time, 3=Yes, all or most of the time) for each time point, with a higher value reflecting greater feelings of safety at school.

Mental health: Self-reported depression and anxiety were assessed using the Depression Anxiety Stress Scale (Lovibond & Lovibond, 1995) which comprised seven items relating to depression and seven items related to anxiety measured on a four point scale (ranging from 0=not at all to 3=applied to me very much, or most of the time). A depression score and an anxiety score were calculated at each time point for each student by adding the items, with higher scores reflecting greater feelings of depression (average alpha=0.89) and anxiety (average alpha=0.82).

Data Collection

Students completed the baseline questionnaires in Term 4 of the final year of primary school (Grade 7, average age 11 years) and then follow-up questionnaires again at the beginning and then the end of the first year after transition to secondary school (Grade 8, average age 12 years) and about 12 months later (i.e., at the end of Grade 9).

Due to the movement of students between schools, baseline student data were collected differently to follow-up student data. At baseline parents were sent a copy of the student questionnaire with the consent form, and a reply paid envelope to return the consent form and if they agreed, their child's completed questionnaire. Parents who did not respond were sent up to two follow-up letters. Follow-up data collections in Grades 8 and 9 were conducted by trained research staff who administered questionnaires to students during class time using a standardized protocol. Students who did not have consent to participate in the study completed alternate learning activities.

Statistical Analysis

Analyses were conducted using MPlus v6 and STATA v12. Victimization trajectories were modelled on the comparison group within MPlus with the censored normal distribution used to account for the censoring at the lower bounds of the victimization scale. A polynomial relationship was used to link victimization with time. All four time-points from longitudinal data collected at the end of Grade 7 to the end of Grade 9 were used in the calculation of trajectories. Missing data at each time point were handled through Full Information Maximum Likelihood (FIML) estimation in Mplus v6 enabling the use of all students with at least one valid score in the analyses. FIML assumes missing at random and produces unbiased parameter estimates and standard errors of the data (Wothke, 1998). Separate multinomial logistic regression models (using robust standard error estimation to account for school level clustering in the data) were fitted in Stata v12 for males and females and were used to determine whether the social health predictors of loneliness, connectedness to school, safety at school and peer support at the end of primary school (Grade 7) could individually be used to predict the identified victimization trajectory groups. Models were run using different trajectory groups as the reference group to explore differences in the likelihood of group memberships. Separate random effect Tobit regression models, taking into account the highly skewed and clustered nature of the data were fitted in Stata v12 to determine differences in students' mental health outcomes (Grade 9) for the different victimization trajectory groups. Mental health measured at the end of primary school (Grade 7) was controlled for in the Tobit regression analyses.

Results

Trajectories of victimization

Developmental trajectories of victimization were identified using the semi-parametric group-based trajectory approach (Nagin, 2005). The dependent variable was victimization measured at the four time points for comparison group students only. This paper uses a continuous victimization measure for each student with a higher score reflecting greater victimization.

To determine the best fitting models, models were compared through an examination of fit statistics as well as theoretical justification and interpretability. Fit statistics examined included the Bayesian Information Criterion (BIC; a smaller BIC value represents a better fit), the Lo-Mendell-Rubin Likelihood Ratio Test (LMR; comparing the current model against the model with one less group should give a LMR and BLRT *p*-value less than 0.05; (Jung & Wickrama, 2008; Nylund, Asparouhov, & Muthén, 2007). To ensure optimal solutions were obtained from the analysis rather than local maxima, 500 random sets of starting values were used in the model. Application of the minimum BIC for model selection did not result in the determination of a clear best model with BIC improving with the addition of groups. The LMR-BLRT test of model fit indicated that increasing the model from four classes to five classes was not significant (p=0.14). Given this non-significant result and the small proportion of students in the fifth high stable class, the four-class model was chosen as optimal.

Figure 1 shows the distinct trajectories of the four-group model for victimization. The largest group (52% of the sample) was the *low stable* group. This group comprised students who reported low levels of victimization across the four time points. The *not*

bullied group (40%) comprised students who did not report victimization over the time period. The *low increasing* victimization group (4%) comprised students who reported low levels of victimization at the end of primary school and the beginning of secondary school, with victimization increasing to high levels by the end of the second year of secondary school. The *medium stable* group (4%) was made up of students who reported medium levels of victimization at the end of primary school and during the first two years of secondary school. An examination of the different types of victimization (physical, verbal and relational) showed higher levels of verbal and relational victimization than physical victimization in all trajectory groups at all time points for both males and females (Table 1). No significant differences between the levels of each type of victimization between each victimization trajectory was found for females, however males in the lower increasing trajectory group had significantly lower physical victimization than other trajectory groups at the end of Grade 8 .

----------Figure 1, Table 1 here----------

Students were assigned to a trajectory group based on their individual probability scores. The distributions indicated that trajectory groups differed significantly on the proportion of male and female students (X^2=48.9, p<0.001) with distributions within the *not bullied* group higher for females (45%) than males (36%), whereas the distributions within the *low increasing* and *medium stable* groups was higher for males (6.2% and 5.0% respectively) than females (1.4% and 1.9%). Due to the significant differences in distributions, trajectory analyses were conducted separately on the male and female samples. Application of the minimum BIC for model selection did not result in the

determination of a clear best model with BIC improving with the addition of groups for both male and female models. The BIC values for two-, three-, four-, and five-group models were compared with the LMR-LRT test of model fit indicating the four-group solution was a better fit than the five-group solution for males (p=0.111) and a three-group solution was the best fit for females (p=0.132).

The male victimization trajectories (see Figure 2) followed the original model with the four groups: *not bullied* (32%), *low stable* (56%), *low increasing* (7%) and *stable medium* (5%). For females (see Figure 3) the three victimization trajectory groups consisted of: *not bullied* (37%); *low stable* (57%); and *low increasing* (6%). No high decreasing or high stable trajectory groups were found for males or females. The low stable trajectory corresponds to victimization once or twice in the previous term over the study period; the stable medium trajectory corresponds to victimization every few weeks in the previous term. The low increasing trajectory corresponds to victimization at the end of primary school increasing from once or twice in the previous term to once a week for males at the end of Grade 9 and from once or twice in the previous term to every few weeks for females at the end of Grade 9.

----------Figures 2 and 3 here----------

Social health predictors of trajectories of victimization

Loneliness, connectedness to school, peer support and feeling safe at school were explored as social health predictors of victimization trajectory group membership. The

extent to which these social health variables predicted membership to all comparisons of the trajectory groups was assessed.

Loneliness: Males who reported more feelings of loneliness at the end of primary school (Grade 7) had increased odds of being in the low stable, low increasing and medium stable than the not bullied victimization groups, however loneliness did not differentially predict membership of the three victimization groups. Females who reported more feelings of loneliness were more likely to be in the low stable group than the not bullied group (Table 2), no other differences were found in the likelihood of membership to the groups based on loneliness scores for girls.

Connectedness: Males who felt more connected to school at the end of primary school had reduced odds of being in the medium stable group, whereas females who felt more connected had reduced odds of being in the low stable or low increasing group compared to the not bullied group. Males who reported less connectedness to school were significantly more likely to be in the medium stable group than in the low increasing and low stable groups, whereas females who reported less connectedness to school were significantly more likely to be in the low increasing than in the low stable group.

Peer support: Peer support was not a predictor of victimization group membership for males. Females who had greater peer support at the end of primary school had reduced odds of being in the low stable group compared to the not bullied group (i.e., were more likely not to be bullied). No other differences were found in the likelihood of membership to the groups based on peer support scores for girls.

Safety at school: Males who felt safe at school at the end of primary school had reduced odds of being in the medium or low stable groups compared to the not bullied group, no other differences were found in the likelihood of membership to the groups based on feelings of safety at school. No significant relationship was found between feeling safe at school and trajectory groups for females.

----------Table 2 here----------

Victimization trajectories and mental health outcomes

All victimized trajectory groups had significantly higher reported levels of depression and anxiety at the end of Grade 9 compared to the not victimized group. At the end of Grade 7 only males in the stable medium trajectory group had significantly higher levels of depression and anxiety than the not victimized group. At the end of Grade 7, females in the low increasing trajectory group had significantly higher levels of depression and females in the low stable trajectory group had significantly higher levels of anxiety than the not victimized group. Furthermore, males and females in the low increasing victimization groups had higher depression and anxiety scores at the end of Grade 9 than those in the low stable groups (Table 3).

----------Table 3 here----------

Discussion

This longitudinal study focused on victimization over the transition from primary to the end of the second year of secondary school, a challenging period for adolescents as they experience environmental, physiological, cognitive and social changes (Barton &

Rapkin, 1987). Primary school (Grade 7) social health (loneliness at school, connected to school, peer support and feeling safe at school) was used to predict victimization trajectory group membership, and victimization trajectory group membership was used to predict mental health outcomes at the end of Grade 9.

Approximately 40% of adolescents in this study experienced no or little victimization at the end of primary school and throughout secondary school with approximately half the students experiencing low stable victimization. A small group of students (4%) reported medium stable levels of victimization from primary through secondary school while a similar proportion were victimized infrequently at the start of secondary school with victimization increasing over the second year of secondary school. Consistent with previous research, the peak for the medium stable group occurred at the beginning of secondary school during the transition from primary to secondary school. In contrast to others who have studied bullying victimization in a younger age group (Boivin et al., 2010; Goldbaum et al., 2003), we did not find high and medium desisting groups or high and medium increasing victimization groups. These differences may be developmental with relational victimization more likely to be experienced during adolescence than physical victimization, as manipulation and aggression are often used as deliberate strategies to acquire power and influence, gain dominance and to increase and maintain popularity with peers during this period (LaFontana & Cillessen, 2010; Salmivalli, 2010).

Gender differences were found in both the shape of the trajectories and the number of trajectory groups. As expected, the not bullied and low stable trajectory groups were similar in shape for both males and females. However, females did not report medium

stable levels of victimization and the curve for males in the low increasing group was steeper than for females in the same group with the males reporting higher levels of victimization by the end of Grade 9. The severity of victimization in males may indicate higher levels of physical than relational victimization being reported with adolescent males generally experiencing more direct physical, direct verbal and indirect types of victimization than females (Craig et al., 2009) whereas relational bullying is more common among girls (Nansel et al., 2001). The marked increase in victimization in males implies focussed bullying interventions may be needed at the beginning of secondary school.

The social health variables examined in this study as predictors of victimization trajectory groups include loneliness at school, connected to school, peer support and feeling safe at school. Students who felt lonely at school or less connected to school were more likely to be in stable or increasing victimization groups, whereas feeling safe at school was protective for males while peer support was protective for females. Males who were lonely were most likely to be in the increasing victimization group while males who felt less connected to school were most likely to be in the medium stable group. Females were who were lonely were most likely to be in the stable group while females who felt less connected to school were most likely to be in the increasing victimization group. During transition, the ability to make new friends (Akos & Galassi, 2004), the number of friends and quality of friendships (Pellegrini & Bartini, 2000), having friends who are able to help and protect, and being accepted by the peer group are the main social factors identified as protective against victimization (Hodges & Perry, 1996). Victimization has a reciprocal effect on loneliness with lonely students more likely to be

victimized by peers (Berguno, Leroux, McAinsh, & Shaikh, 2004) whereas those victimized are more likely to be lonely, as other peers avoid them for fear of being bullied themselves or losing social status among their peers (Nansel et al., 2001). Confirming prior cross-sectional research where males reported greater perceptions of school safety than females (Brown, Birch, & Vijala, 2005; Varjas, Henrich, & Meyers, 2009), this study found feeling safe at school was a protective factor against victimization for males but not females. Peer support is a factor that can influence feelings of safety at school (H. Cowie & Oztug, 2008). This is especially the case among female friendships which are generally fewer in size but stronger than male friendships. In these relationships females generally display greater pro-social and empathetic skills (Bosacki & Wilde Astington, 1999) and place greater importance on social relationships and peer support than males (Smith & Watson, 2004). Findings from this study add to the body of evidence that lonely students are more likely to be victimized.

This longitudinal research supports prior cross-sectional research which found existing relationships between chronic victimization and mental health (Hawker & Boulton, 2000). Importantly, contrary to what was expected, the results of this study show the impact of victimization onset at the start of secondary school has a greater impact on mental health than prolonged victimization. While many students during school transition have to deal with the onset of puberty and the changes in peer relations (and the consequential rise in social stress), in this study the additional effect of onset of victimization is greater than prolonged victimization.

The resulting mental health outcomes of students in the stable and increasing victimization groups highlight the importance of school transition programs which focus on increasing social health and the awareness and prevention of bullying in minimising harm to students. Prior to and during the primary to secondary school transition period is a critical and opportune time to address student social health. Transition programs can foster school connectedness and feelings of safety at school through a strong school ethos of care, clear social support systems where relationships promote health and well-being and positive classroom management (H Cowie, Naylor, Talamelli, Chauhan, & Smith, 2002). Effectively communicating to the school community the school's bullying prevention policy and actions will help to reduce victimization and also increase the students' perceived sense of safety at school: as will increasing adult supervision and enhancing their ability to prevent, detect and intervene in bullying incidents; and enabling students to support victimized students and easily report bullying (Bradshaw, O'Brennan, & Sawyer, 2008). Peers can reduce bullying by intervening and helping the person being victimized (Salmivalli, 1999) while student, parent and teacher support can buffer victimized students from internalising distress (Rigby, 2000). A students' social health can be opportunistically developed in adolescence by modification of the social environment, spending time with pro-social peers and adults, and through targeted skills training.

The prolonged victimization measured in this study is at relatively low levels, measured over a relatively short period of time. Whilst the relationships between social health factors and victimization, and victimization and mental health, can be bi-directional and may already be well established for some students by the time they complete primary

school, it is important to examine the predictors of increasing or stable victimization prior to the transition period. Research into victimization measured over a longer period of time would further inform the relationships between social health, victimization and mental health, and highlight critical times at which to intervene.

Strengths and limitations

There are several strengths of this study. Most importantly, the two-year (four time-points) longitudinal nature of the research design over the transition from primary to secondary school enabled the determination of trajectory groups, social health predictors and the mental health outcomes at a time that can be socially challenging for most students. Moreover, these findings are robust due to the large sample of students (90%) who completed questionnaires in at least three of the four data collection points. Despite these strengths, there are several limitations to this study. First, the use of self-report of social health, victimization and mental health could result in some of the associations being due to shared method variance. The use of peer, teacher or parent reports would be useful in examining the relationships further. In addition, the collection of data at home among Grade 7 students was inconsistent with classroom-based data collection procedures used in Grades 8 and 9. To reduce the impact of these differences an explicit and standard protocol (as used in the classroom) was provided to parents for all Grade 7 assessments, however parents still may have indirectly or directly influenced their children's responses to the questionnaire. While absentee students and those lost to follow-up (approximately 11%) may be more involved in bullying perpetration or victimization behaviours, this potential bias is unlikely to

influence the results substantially given the large number of respondents at each data collection. Further, the results may not generalise to the other similar aged student populations as the sample included only Catholic primary and secondary schools within the Perth metropolitan area. Finally, the trajectory groups were calculated over a relatively short time period (3 grade levels) and as such the associations between victimization behaviours, social health and mental health may have been established prior to the commencement of the study.

Conclusion

The impact of chronic victimization on mental health problems in adolescents makes understanding the social health predictors of those within victimization trajectory groups an important priority, especially during transition from primary to secondary school. Adolescents with poorer social health were more likely to be in the increasing and stable trajectory groups than in the not bullied group. Additionally, onset of victimization during transition was associated with poorer mental health outcomes than low stable or no victimization. To enhance the mental health of adolescents, a social health school intervention approach involving primary and secondary schools would help to limit victimization and the harms caused by long-term exposure.

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