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Three year results of the *Friendly Schools* whole-of-school intervention on children's bullying behaviour

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Abstract

A group randomized controlled trial tested the efficacy of the Friendly Schools program to reduce student bullying behaviour. This socio-ecological intervention targeted the whole school, classroom, family, and individual students to reduce bullying behaviour. Self-report data were collected in 29 schools over three years from a cohort of 1,968 8-9 year olds. Surveys measured frequency of being bullied, bullying others, telling if bullied and observing bullying. Results indicate intervention students were significantly less likely to observe bullying at 12, 24 and 36 months and be bullied after 12 and 36 months, and significantly more likely to tell if bullied after 12 months than comparison students. No differences were found for self-reported perpetration of bullying. The findings suggest whole-of-school programs that engage students in their different social contexts appear to reduce their experiences of being bullied and increase their likelihood of telling someone if they are bullied.

INTRODUCTION

Bullying between students at school can seriously affect their social, physical and psychological well being as well as their academic achievement. Students who are bullied, compared to those who are not, tend to experience poorer health, more somatic complaints and greater risk of injury (Gini & Pozzoli, 2009; Strabstein & Piazza, 2008; Williams, Chambers, Logan, & Robinson, 1996; Wolke, Woods, Bloomfield, & Karstadt, 2001); poorer self-esteem (Jankauskiene, Kardelis, Sukys, & Kardeliene, 2008; Salmivalli, Kaukiainen, Kaistaniemi, & Lagerspetz, 1999); more interpersonal difficulties (Kumpulainen et al., 1998); higher levels of loneliness (Forero, McLellan, Rissel, & Bauman, 1999; Kochenderfer & Ladd, 1996b; Nansel, Overpeck, Pilla, & Ruan, 2001); depression (Fekkes, Pijpers, Fredriks, Vogels, & Verloove-Vanhorick, 2006; Juvonen, Graham, & Schuster, 2003; Roland, 2002); increased anxiety (Juvonen et al., 2003; Kumpulainen, 2008); and score higher on measures of suicidal ideation (Kaltiala-Heino et al., 1999; Roland, 2002; Van der Wal, de Wit, & Hirasing, 2003). As such, they are also more likely to both dislike (Forero et al., 1999) and want to avoid school (Kochenderfer & Ladd, 1996a; Rigby, 1997a), as well as suffer from impaired concentration in class,(Boulton, Trueman, & Murray, 2008). Subsequently their level of school attendance and academic competence tends to be lower (Beran & Lupart, 2009; Fonagy, Twemlow, Vernberg, Sacco, & Little, 2005; Glew, Fan, Katon, Rivara, & Kernic, 2005; Smith, Talamelli, Cowie, Naylor, & Chauhan, 2004c; Strabstein & Piazza, 2008). Similarly, students who bully others regularly are at risk of a wide range of health, safety and educational problems, including injury requiring hospitalisation, weapon carrying, setting fires and runaway episodes (Strabstein & Piazza, 2008). Students who bully others have a higher incidence of mental health problems (Craig, 1998; Kaltiala-Heino et al., 1999; Kumpulainen, 2008) than those students who do not

bully (Zubrick et al., 1997). These students are also more likely to have low academic competence (Strabstein & Piazza, 2008), are often more unhappy at school (Zubrick et al., 1997), and demonstrate an increased likelihood of engaging in delinquent behaviour (Kumpulainen & Rasanen, 2000; Van der Wal et al., 2003), smoking, drinking alcohol and substance use (Kaltiala-Heino, Rimpela, Rantanen, & Rimpela, 2000; Nansel et al., 2001; Strabstein & Piazza, 2008).

Bullying can be defined as repeated aggressive behaviour within a relationship characterised by a real or perceived imbalance of power, in which the student exposed to the aggressive actions cannot adequately defend him/herself (Olweus, 1999). Approximately 28% of grades 5 to 7 Western Australian students report being bullied and 8% report bullying others every few weeks or more often during the last school term (Cross et al., 2009). While there is a significant increase in reported cases of bullying following transition to secondary school (Rigby, 1997b), overall Australian primary school students' report being bullied more frequently than older students (Rigby, 1997b; Whitney & Smith, 1993). Other research has also observed higher rates of bullying among younger students, with the frequency of bullying declining in adolescence (Finkelhor, Ormrod, & Turner, 2009; Whitney & Smith, 1993).

Primary school students (and their parents and teachers) are obvious targets for prevention-based intervention. This age group appears more amenable to bullying behaviour change, as they are more pro-social and supportive of those who have been bullied and are more likely to want bullying to stop than older students (Gini, Pozzoli, Borghi, & Franzoni, 2008; Rigby, 1997b; Smith, 1991). Further, interventions that reduce bullying in schools have been found to be more successful with this age group (Olweus, 1994; Rigby & Slee, 2008; Smith, Schneider,

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Smith, & Ananiadou, 2004a; Smith, 1997; Smith & Ananiadou, 2003; Vreeman & Carroll, 2007).

Increasingly, evidence suggests that whole-of-school universal interventions are the most effective, non-stigmatizing means to reduce bullying behaviour (Rigby & Slee, 2008; Smith, Ananiadou, & Cowie, 2003; Stevens, Bourdeaudhuij, & Van Oost, 2001; Vreeman & Carroll, 2007). Given bullying is a systemic problem, it is unlikely that a single level program such as classroom curriculum only could provide an effective solution (Smith et al., 2004a; Vreeman & Carroll, 2007). The more successful whole-of-school health promotion programs encourage the active participation of parents, students, teachers and the wider school community, to plan, implement and evaluate school policies, procedures, classroom curriculum and professional development (Cross et al., 2003; Nutbeam, 1992).

Research investigating ways to intervene with bullying in primary schools has had mixed results (Rigby & Slee, 2008). The whole-school approach to preventing and intervening in bullying was pioneered by the Olweus Bullying Prevention Program, targeting students, teachers and parents, which demonstrated reductions in bullying behaviour of around 50% in Bergen, Norway (Olweus, 1994; Vreeman & Carroll, 2007). However, as Smith, Schneider, Smith and Ananiadou (Smith et al., 2004a) state, success of this magnitude has yet to be reproduced elsewhere. In contrast an evaluation of the Olweus program in Rogaland, another part of Norway, revealed that bullying had slightly increased (Roland, 2000). Subsequent adaptations of the Olweus program have reported less successful or mixed results in Germany (Hanewinkel, 2004), Belgium (Stevens, Bourdeaudhuij, & Van Oost, 2000) and the United States (Bauer, Lozano, & Rivara, 2007; Limber, Nation, Tracy, Melton, & Flerx, 2004). Some suggest the

results achieved by the Olweus program in Norway may be due to the higher quality of Scandinavian schools, the historical context in which the program was imbedded, the more common practice of state intervention in social welfare matters and the higher level of involvement and interaction between the schools and the researcher in the original study (Smith et al., 2004a). Notably, the original Bergen study was limited by its use of non-random selection, and time-lag comparisons rather than a randomized control group design.

Later research by Olweus also achieved significant but more modest reductions than the original Bergen study, including a 21% to 38% reduction in bullying problems in the New Bergen Project Against Bullying, around a 40% reduction in being bullied and a 50% reduction in bullying others following implementation of the Olso Project Against Bullying (Olweus, 2004).

Other whole-school anti-bullying interventions, such as the Sheffield project, have shown positive, but more modest program effects than observed in the original Olweus evaluation (O'Moore & Minton, 2004; Smith, Sharp, Eslea, & Thompson, 2004b; Stevens et al., 2000; Whitney, Rivers, Smith, & Sharp, 1994). Some programs, such as intervention research in Toronto, Canada, observed few positive changes, and for one school whilst rates of being bullied decreased, the reported prevalence of bullying others increased (Pepler, Craig, Ziegler, & Charach, 1994).

One study which produced results approaching the level of the success achieved in Bergen, was the Seville study in Spain (Ortega & Lera, 2000), which demonstrated significant reductions in students involved in bullying behaviour following implementation of the SAVE project with a greater than 50% decrease in the number of students being bullied (Ortega, Del Rey, & Mora-

Merchan, 2004). However, these results were limited by a non-random selection of schools and high levels of school attrition.

Salmivalli and colleagues (2005) reported moderate effects of a systemic school, class and student level intervention on bullying behaviour for low implementing schools (-15% to -29%) and good effects (-46% to -57%) for high implementing schools. This study was limited by the use of time-lag comparisons.

A recent intervention study by Frey, Hirschstein, Edstrom and Snell (Frey, Hirschstein, Edstrom, & Snell, 2009) found that the Steps to Respect school wide intervention produced around a 31% reduction in bullying, and a reduction in bystander support for aggression, however a decrease in bystanders' willingness to report bullying was also observed. Notably, this intervention only focussed on playground behaviour, so its influence on bullying occurring in other locations is not clear.

In a recent review of school-based anti-bullying interventions, it was concluded that the overall success of such interventions in reducing bullying have been, at most, moderately successful (Rigby & Slee, 2008). Yet, it has been proposed that interventions which incorporate a multi-dimensional, whole-school approach have a greater likelihood of success (Rigby & Slee, 2008; Vreeman & Carroll, 2007), and that the degree of school commitment and implementation of the intervention is an important factor contributing to the effectiveness of interventions (Rigby & Slee, 2008; Smith & Ananiadou, 2003). Smith, Schneider, Smith and Ananiadou (Smith et al., 2004a) state that whilst evaluations of bullying interventions have found limited success, there is insufficient grounds to justify the abandonment of such programs, and so cautiously

recommended that whole school anti-bullying interventions continue to be implemented, until their effectiveness is evaluated further.

For many of these studies the validity of the findings are affected by attrition and non-random selection of schools. Further, most risked Type I error by not analyzing outcomes using multi-level hierarchical models (Bryk & Raudenbush, 1992) to control for the shared variance of 'clusters' of student responses within schools. Most of these intervention programs included support for students who are victimized and the perpetrators; classroom curriculum and some whole-of-school components (mostly the development and implementation of whole school policy), but few included interventions for parents.

To the best of our knowledge, the Friendly Schools (FS) Project is one of the first empirical trials to rigorously evaluate the effectiveness of a whole-school intervention designed to reduce bullying in Australian primary schools. This paper reports findings that relate to middle school students' experiences with bullying. In this trial we tested the following hypothesis: Grade 4 (8-9 year old) students from schools that received the Friendly Schools bullying reduction intervention program over a two-year period will be bullied less, will bully others less often, will report the bullying more often if they were bullied, and will observe less bullying of others in the school compared to students who do not receive the intervention.

METHOD

Design

The Friendly Schools Project was a two-year group randomized controlled trial with a one-year

follow-up, conducted in over 90 classes drawn from 29 metropolitan government primary

schools in Perth, Western Australia. As shown in Table 1, Grade 4 students were tracked for

three years from baseline in April 2000 to posttest 3 in November 2002.

- Insert Table 1 about here -

Sample

To control for the design effects of clustering and attrition, 29 schools were randomly selected

from the pool of all government primary schools in the Perth metropolitan area (n= 305 schools)

and randomly assigned to one of two treatment conditions, such that 15 received the intervention

and the remaining 14 acted as a comparison condition (standard Government health education

curriculum and bullying policy and practice). To increase equivalence between intervention and

comparison schools prior to randomization, schools were stratified by socio-economic status and

their size according to the total number of students enrolled in the school. Students in Grade 4 in

the randomly selected schools formed the primary study cohort.

Of the 2,068 Grade 4 students enrolled at these schools, 1,968 (95.2%) completed questionnaires

at baseline, 1,046 students (96.2%) in the intervention schools and 922 students (94.0%) in the

comparison schools. Non-respondents included absent students and students whose parents

refused consent. Only 31 (1.4%) parents withdrew their children from the study's data collection

after receiving a consent letter that described the data collection purpose and procedures. While

students were advised at the time of data collection they could refuse to participate, all chose to

complete the questionnaires.

Power calculations

Power calculations suggested that a sample with a minimum of 350 students in each of the intervention and comparison groups would have 80% power at a (two-sided) significance level of 0.05 to detect a difference of 8% in the proportion of students who report experiencing bullying (Zubrick et al., 1997). By adjusting the sample using a conservative intra-cluster correlation of 0.02 (Murray, 1998) and a 20% projected attrition rate over the three years, a total of 1,396 Grade 4 students were necessary (approximately 28 schools – 14 per condition), to yield the requisite number of students to detect the projected effects.

Student measures

As shown in the Friendly Schools theoretical framework in Figure 1, the student questionnaire measured three groups of data; (a) bullying-related and psychological outcome variables, (b) mediating variables; attitudes to bullying, perception of social support, knowledge of bullying and school adjustment, and (c) moderating variables including gender, school size (small < 500 students, moderate 500-700 students, large > 700 students) and SES (using parent report of education levels). Only bullying-related outcomes are analysed in this paper.

- Insert Figure 1 about here –

The items from the student questionnaire used to measure the four bullying-related outcome variables included:

- how often they were bullied last term at school (almost every day / most days / once a week / every few weeks / 1-2 times/never);

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- how often students bullied others on their own or with a group last term at school (almost every day / most days / once a week / every few weeks / 1-2 times/never);

- whether they told someone if they were bullied (not bullied / tell someone / tell no-one); and

- whether they saw a student in the same year or younger being bullied at school last term (didn't see vs. saw and joined in / thought bullying was okay / none of my business / thought I should help / tried to help).

These items were based on those developed in previous anti-bullying research (Olweus, 1996; Rigby, 1998). Our definition of bullying was adapted to suit Australian students from one developed by Olweus (1994). It was described to students during the questionnaire administration as follows: "Bullying is when a person is ignored, left out on purpose, or not allowed to join in; hit, kicked or pushed around; has lies or nasty stories told about them to make other kids not like them; is made afraid of getting hurt and/or made fun of and teased in a mean and hurtful way". It was also explained to students that "when teasing is done in a friendly and playful way it is not called bullying, and that while fighting is not a good thing to do, it is not bullying when two students who are as strong as each other get into a fight. If two people who are normally friends have an argument this isn't bullying".

All items in the student questionnaire were tested for face validity and reliability (test-retest) with a group of 144 similar aged students from a low, moderate and high socio-economic status schools not part of the study sample. Kappa and weighted Kappa statistics for these four outcome variables ranged from .45 (bullied others) to .62 (telling someone if bullied).

Procedure

The principal from each randomly selected school received a letter outlining the project and inviting their school to participate. Within each school the cohort of Grade 4 students, their teachers and parents were recruited using passive consent procedures. The research protocol and school and parent consent procedures were approved by the Curtin University Human Research Ethics Committee.

Data were collected on four occasions over three years as shown in Table 1, from all consenting cohort students using self-complete questionnaires. To standardize the student questionnaire administration at each data collection, trained research staff (most of whom were blind to condition) administered questionnaires to students in their regular classrooms. Using pictographs and a simplified definition of bullying described previously, the administrators taught students what was meant by the term 'bullying' prior to students responding to items about bullying behaviour. Also, to minimize the effect of students' reading ability on the reliability and validity of their responses, the administrators read each item aloud to all students.

The questionnaire was divided into two sections of approximately 20 minutes and administered either side of a morning break to maximize student concentration. Student confidentiality was maintained through the use of independent administrators and the use of identification numbers on the questionnaires. Also, students were advised the data were to be used for research purposes only. To minimize attrition, cohort teachers were trained to administer questionnaires to students who were absent on the day of the initial administration. These questionnaires were placed in sealed envelopes and subsequently collected by project staff.

The Friendly Schools Intervention

The Friendly Schools (FS) intervention was designed using a whole-of-school approach to help build students' social competence and relationships to reduce the likelihood of bullying, and to reduce the harm students may experience from bullying. It was based on the Principles of Successful Practice for Bullying Reduction in Schools developed by this research team in 1999 (Cross, Pintabona, Hall, Hamilton, & Erceg, 2004). These principles, organised in accordance with the World Health Organization (WHO) Health Promoting School Model (World Health Organization, 1996), were developed using a triangulation of theoretical, empirical and practical (via case studies) evidence of effective strategies that engage the whole school to address bullying. The validity of the principles was tested in 1999 using a DELPHI (Delbecq, Van de Ven, & Gustafson, 1986) process with an expert panel of international bullying prevention researchers (Cross, Pintabona, Hall, Hamilton, & Erceg, 2004). The validated principles demonstrate how a school's social and ecological environment can impact on bullying behaviour and that successful bullying interventions require a multi-component, systems-based approach (Cross et al., 2004). Social Cognitive Theory (Bandura, 1977), Ecological Theory (Salzinger, Feldman, Stockhammer, & Hood, 2002), and Social Control Theory (Benda & Turney, 2002) supported the development of the whole-of-school strategies addressing the school's social climate, group mechanisms of bullying, normative social influence, social support, empathy, and outcome expectancies.

To strengthen the intervention's scientific foundation and utility for teachers, its formative development was iterative and actively involved students and teachers similar to but not part of the study cohort in the design and pilot testing of its components.

The Friendly Schools program used three levels of intervention to involve:

1. The whole-school community to build their commitment and capacity to address bullying (whole-school intervention);

2. Students' families through awareness raising and skills-based self-efficacy activities (family intervention); and

3. Grades 4-5 students and their teachers through the provision of teacher training and comprehensive teaching and learning support materials (classroom intervention).

Whole-school intervention

Four to five key staff were selected by each intervention school to form a whole-school team to lead their school's delivery of the FS program. As part of the capacity development and professional learning for this role, teams were asked to participate in a four-hour intensive training in each of the first and second years of the study (2000 and 2001). They also received a comprehensive planning and strategy manual to systematically guide the FS teams' review of their school's current practices, and to plan and implement their school's policy and other bullying prevention and management activities, especially adult monitoring and supervision to reduce bullying. Committee members were also trained to manage bullying incidents at the student level using the Method of Shared Concern (Pikas, 2002). Each whole-school team also received school-based summaries of results following each student and parent data collection, to help inform and encourage their implementation of FS strategies.

Family intervention

Nine, 10-15 minute home activities linked to the classroom learning activities were provided to parents of the study cohort in intervention group schools during the two-year trial. These home

activities were developed to reinforce and practice classroom learning and to raise parents'

awareness, utility knowledge, skills and self efficacy to talk with their children about bullying.

Further, 16 brief skills-based newsletter items (eight for each year of the intervention) were

developed to increase intervention parents' awareness of and skills to help their children prevent

and manage bullying. Other whole-of-school parent-related awareness activities included their

invited involvement with the development and dissemination of their school's bullying policy.

Grades 4 and 5 classroom intervention

In each of the first two years of the study interactive, student-centred learning activities were

designed to be implemented with the study cohort (during Grades 4 to 5). These learning

activities were designed to be implemented for approximately three hours at the start of three 10

week terms in each of the first two school years (nine hours/year) to boost students' knowledge,

attitudes and skills. To support this teaching and learning and to encourage teacher

implementation, training and self-contained manuals detailing the key learning outcomes,

background information, and the cross-curricular learning activities (including support materials

such as game pieces, resource sheets and videos) were provided to each intervention teacher.

In the first and second study years intervention classroom teachers received six hours of

intensive interactive professional development to enhance their comfort, knowledge, skills and

confidence to teach the curriculum, and to help them manage student bullying.

The learning activities were designed to build pro-social skills, including peer discouragement

of bullying, social support for individuals being bullied, non-violent conflict resolution, and

other interpersonal problem solving skills, and to build empathy for individuals being bullied.

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They also aimed to enhance students' understanding of what constitutes bullying and how to respond to bullying, and why bullying is unacceptable behaviour. The activities also targeted: students' ability to talk about bullying with each other and adults; how to respond adaptively to bullying including reporting bullying; seeking support; and responding assertively.

Comparison schools

The comparison schools were encouraged to teach the standard state health education curriculum, which included approximately three hours in each school year of activities specifically related to bullying prevention and social skill development. To balance the special attention given to intervention schools and possible Hawthorne effects (Portney & Watkins, 2000), comparison schools were offered free-of-charge road safety education materials and teacher training previously developed by our research team. Comparison schools also received the Friendly Schools intervention materials in the third year of the study.

Analysis

Random effects binary logistic regression models were fitted in Stata 8 (StataCorp, 2003) which included random intercepts to account for school level clustering. Because longitudinal methods for clustered categorical data are not yet well established, each posttest time point was modelled separately in an ANCOVA type model which controlled for baseline values of the dependent variable, student gender and school size. The four multi-category outcome variables were dichotomized for inclusion as dependent variables in the logistic regressions. The two variables; how often bullied and how often bullied others, were each dichotomized in two ways, namely any bullying behaviour versus none and frequent bullying behaviour (every few weeks or more often) versus less frequent or not at all, and each dichotomized variable was analyzed in a

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separate analysis. Bonferroni adjustments were made to significance levels to account for the multiple comparisons of the outcome variable categories.

Whilst odds ratio are the preferred measures of effect size for categorical variables (CONSORT., n.d.; Fleiss, 1994), effect size values based on differences in percentages were calculated to compare our results to those of previous studies. Effect size statistics were calculated as the difference in rates in the intervention and comparison groups at the posttest measurement expressed as a percentage of the average of the two groups' baseline rates.

Intention to treat analyses were conducted i.e. intervention effects were estimated with students assigned to the study condition to which their school was randomized at baseline. Gender and school size were included in all models to control for possible effects.

Program implementation

To measure the integrity of program implementation, self-report teacher logs were provided in the teacher manuals and a student reflection resource sheet integral to each learning activity was developed and used as a criterion measure of teacher implementation of the classroom materials. Intervention teachers were asked to substitute the *Friendly Schools* learning activities with those they would normally teach from the state curriculum.

Grade 4 intervention teachers (in 2000) reported teaching a median of eight (9.5 hours) of the nine classroom lessons. In 2001 the intervention teachers of the cohort, then in Grade 5, reported teaching a median of six of the 10 classroom lessons (8 hours). Hence, the intervention student cohort received a median dose of 17.5 hours of classroom activities during 2000 and 2001. Regarding the family activities, parents of the intervention students reported completing a

median of two of the nine family activities (22%) in 2000 and one of the nine family activities (11%) in 2001.

The comparison group received the FS intervention training during the first half of the third year of this study, but no data were collected to determine how much of the program was implemented by comparison teachers during that time.

RESULTS

Attrition

As shown in Table 2, at baseline the Grade 4 student cohort comprised 1,968 8-9 year olds, of which 1,847 (93.9%) responded at posttest 1, 1,636 (83.1%) at posttest 2 and 1,376 (69.9%) at posttest 3. Two thirds of the baseline students (67.6%, n=1,330) completed *each* of the three follow-up questionnaires at the end of 2000, 2001 and 2002. Approximately 18% of non-respondents were lost to follow-up because they moved to non-study schools. In addition some students did not complete questionnaires at particular time points. All available data were included in the analyses.

- Insert Table 2 about here –

The representation of the respondents was assessed both within and between intervention groups to determine selective and differential attrition. Selective attrition was assessed by comparing the baseline demographic and outcome data for the respondents who completed post-test 3 ($n = $ 1,376) with data for the students lost-to-follow-up at some point over the duration of the study ($n = 592$). The lost-to-follow-up students were more likely than respondents to be bullied more

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regularly (45.2% vs. 39.0%) (χ^2 (2, n =1,963) = 15.0, p = .001) and were less likely to tell

someone if they were bullied (χ^2 (2, n = 1,956) =12.3, p = .002). No differences were found

regarding the frequency of bullying others (χ^2 (2, n = 1,957) = 4.2, p = .124), whether they saw

others bullied (χ^2 (1, n = 1,945) = 2.8, p = .096), gender (χ^2 (1, n = 1,967) = 0.6, p = .446),

parental education (χ^2 (3, n = 1,475) = 2.5, df = 3, p = .475) or size of the school they attended (t

= -0.9, p = .340).

Differential attrition was examined by comparing the baseline demographic and outcome data

for the intervention and comparison group students' lost-to-follow-up. The intervention (n =

358, 34.2%) and comparison (n = 234, 25.4%) group students' lost-to-follow-up were similar

for all characteristics except gender (χ^2 (1, n = 591) = 5.7, p = .017), parental education (χ^2 (3,

n = 414) =17.5, p = .001) and school size (t = 2.7, p = .007) but none of the outcome variables.

The comparison group students' lost-to-follow-up were significantly more likely to be boys

(55.1% vs. 45.1%), have parents with higher levels of education (60.8% vs. 44.0% with a

qualification beyond Grade 12) and attend schools with fewer students (*mean* of 628 vs. 669

students) than the lost-to-follow-up intervention students.

- Insert Table 3 about here –

As shown in Table 3, the two study conditions were similar with regard to age and gender

distribution at baseline, however the comparison group students attended on average smaller

schools and their parents were more highly educated.

Primary Outcomes

The baseline results for the four outcome variables are presented in Table 4.

- Insert Table 4 about here –

At baseline the two study conditions were similar with regard to the frequency of being bullied (χ^2 (2, n = 1,963) = 0.35, p = 0.841), of bullying others (χ^2 (2, n = 1,957) = 1.82, p = .403) and of telling if bullied (χ^2 (1, n = 1,956) = 0.4, p = .505), but differed with regard to whether students had seen another Year 4 or younger student being bullied (χ^2 (1, n = 1,945) = 6.2, p = .013). Overall 14% (n = 274) of students reported bullying another student, on their own or as part of a group. In comparison, approximately one in six students (16.3%, n = 320) reported being bullied every few weeks or more often and almost a quarter (24.6%, n = 482), once or twice a term. Just less than one third (31.9 %, n = 289/906) of students who were bullied did not speak to anyone about being bullied. Intervention group students were more likely (48.8%, n = 506) to have seen another student in Year 4 or younger bullied in the previous term than comparison students (43.2%, n = 392).

- Insert Table 5 about here -

Table 5 shows significant differences between the study conditions in the first and third year of the study. For each year, results are presented for each of the two analyses fitted to the different dichotomisations of the outcome variable. At posttest 1 when the students were still in Grade 4, students in the comparison group had an increased likelihood of being bullied vs. not bullied (p

= .004). The comparison group students were 1.5 times more likely to be bullied than those in the intervention group with an effect size of -16%. However, when comparing the probabilities of being bullied regularly in Grade 4, no significant differences between groups were observed at this time point (p = .323). No significant differences were found in Grade 5 between the study conditions, either with regard to being bullied (p = .117) or being bullied regularly (p= .996). At posttest 3, when in Grade 6, the students in the comparison group were no more likely to be bullied overall (p = .133) but had 1.5 times higher odds (an effect size of -31%) than the intervention group students of being bullied regularly (p = .010).

No statistically significant differences were observed between the intervention and comparison group students regarding the frequency of bullying other students (Table 5).

- Insert Table 6 about here –

One of the objectives of the intervention was to encourage students who were bullied to seek help by speaking to someone about the bullying. At every time point, the comparison students in the study were more likely to have told no-one they were being bullied, as indicated by odds ratios greater than one (Table 6). At posttest 1 these differences were significant (p = .001), and the effect size was the greatest (-30%), with comparison students reporting a1.6 times higher odds of not telling than intervention group students.

Comparison group students had significantly higher odds of reporting seeing another student being bullied at the end of the first year of the intervention (p = .031), at posttest 2 (p = .003) and posttest 3 (p = .001). As shown in Table 6, at the end of the first (OR =

1.4), second (*OR* = 1.5) and third year (*OR* = 1.7) of the intervention, with effect sizes of -11%, -16% and -21% respectively, the comparison group students were approximately one and a half times more likely than intervention group students to indicate they saw another student in their year level or younger, being bullied.

Discussion

This paper reports the impact of the Friendly Schools whole-of-school bullying prevention intervention on a cohort of primary school students' experiences with bullying behaviours.

Summary of findings

Overall, findings from the Friendly Schools intervention trial partly support our study hypothesis. We found that students in the intervention group at the end of the first study year were significantly less likely than comparison students to report being bullied versus not bullied. Also, at the end of the third year of the study (cohort students finishing Grade 6) intervention students were less likely than the comparison students to be bullied regularly, although no differences were found at the end of the second study year when the students were finishing Grade 5. Importantly however, at every posttest the intervention group students were approximately one and half times less likely than the comparison students to report seeing another student their age or younger being bullied. Similar to Smith and colleagues' findings (Smith et al., 2003) at the end of the first study year intervention students were significantly more likely to have told someone they were being bullied than were comparison group students. Consequently, the program appears to be most effective in Grade 4 and possibly Grade 6 but not in Grade 5, and not for bullying of another student. The odds ratios for significant comparisons

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between the study conditions on the outcome variables ranged from 1.4 to 1.7 and the effect sizes calculated using differences in percentages ranged from 11% to 31%, indicating small to moderate effects.

These findings are similar to previous controlled studies that used a whole-of-school approach. In a recent review of school interventions to reduce bullying, it was concluded that at least some of these programs have achieved a modest level of success (Rigby & Slee, 2008). Smith et al. (2004a) reviewed the effects of the seven most rigorous anti-bullying programs that permitted comparisons between intervention and control groups. Using effect size categories proposed by Cohen (1988) the authors found that only 14% of these studies (the vast majority of which were not randomised and/or controlled) were found to have small positive effects in terms of self-reported victimisation outcomes, with the remaining 86% reporting negligible or negative effects i.e. none found medium or large effects. According to Cohen's categories, we found small to moderate effects (16% and 31% reductions) related to self-reported victimization. For self reported bullying of others, similar to our FS study, all seven studies reported effects that were negligible or negative (Smith et al., 2004a). Moreover this study also found consistent significant positive effects for observing less bullying that increased from 11% at posttest 1, to 16% in posttest 2, and then 21% at posttest 3.

Several reasons may account for the lack of program effects on students who bully others. Firstly, the program while whole-school in approach largely targeted only one age group of students and their teachers and parents at the classroom and home levels. Grade 4 students were selected as the study cohort to reduce the typical acceleration of bullying behaviour that occurs around Grade 5 and 6 in Australian schools (Rigby & Slee, 1991). While it is important to target

a behaviour when it will have maximal impact (Mrazek & Haggerty, 1994), focusing on one age group may have limited this intervention's effectiveness. Whereas teachers of the intervention cohort were very supportive of the strategies to reduce bullying, the remainder of the school community were less enthusiastic.

To encourage a more consistent implementation of policy and practice and to achieve the synergistic effects of a whole-school approach, all students and their teachers and parents need to be involved with the intervention, including developmentally appropriate classroom and home learning activities. This may be especially important given approximately 20% of the cohort students each year reported they were bullied by students older than them, whose teachers and parents were not provided with classroom and home activities to support bullying behaviour change. Future research needs to determine what developmentally appropriate learning and environmental change is required to enhance teaching and learning outcomes for all students.

One possible explanation for the lack of program effects on reports of bullying others is that it may not be possible to change perpetrators' behaviour using only universal whole-school activities. This group of students may require greater support for behaviour change through selective and targeted approaches. Rigby and Slee (2008) propose that different treatments may be required depending on the severity of bullying, and the age, social and psychological characteristics of the children involved. While not widespread, some intervention schools in the current study reported successfully using the Method of Shared Concern (Pikas, 2002) in the second and third study years, as recommended in the FS intervention, to support students involved in bullying. Process data suggest intervention schools required more comprehensive

training and support to implement this and other strategies to reduce the perpetration of bullying. Future research should investigate the specific needs of schools to adequately support behaviour change among students who bully others, including altering negative reputational biases these students may experience from their peers even when behaving in socially appropriate ways (Hymel, Wagner, & Butler, 1990).

Contrary to some previous research (Eslea & Smith, 1998; O'Moore & Minton, 2005) intervention students in this study were more likely at each posttest to report they told someone if they were bullied, although this reached statistical significance at posttest 1 only. While the act of telling is important, this finding may also be an indicator of students believing schools will take positive action to help them. While this effect didn't sustain statistically beyond posttest 1, it has been suggested that the effective implementation of an anti-bullying program means students may not need to tell others as often because they feel more supported by other students (who may have told someone for them) or teachers (Eslea & Smith, 1998), or they may feel more empowered to deal with the bullying themselves. Conversely, intervention students who were bullied may not report bullying with increasing age because of poor experiences after telling. In other research students report it is common for a teacher to do nothing when they are told about bullying, or to make the situation worse if they did intervene (Bradshaw, Sawyer, & O'Brennan, 2007). The FS intervention did, however, provide strategies to help establish a whole-school climate conducive to responding immediately and supportively to reports of bullying. This intervention targeted student efficacy to tell (and other actions to deal effectively with bullying), and encouraged students who observe bullying to respond in empathetic and supportive ways to help students who are bullied.

Most schools in this study took at least a year to establish their whole-school team, consult with the school community, and review their bullying behaviour policy. This slower than anticipated level of implementation was related to school-based industrial action and other demands on teachers throughout this three-year trial to implement new state-wide curriculum frameworks and monitoring tools. Despite our outstanding school retention rates and interest from senior school administrators, many intervention schools reported they were experiencing 'change overload' and had insufficient capacity, especially time and skills, to effectively implement the program. Consequently their implementation of policy and other whole-school practices (but not classroom teaching and learning) typically occurred in the second and third years of the study. Hence, the whole school intervention required greater development of staff capacity and more obvious linkage to existing structures or other policy and program areas in the school. While disappointing, this finding is consistent with previous research which found that establishing a new committee to lead the implementation in schools requires much support and can take longer than 12 months (Bond et al., 2004; Lynah, Knight, Schofield, & Paras, 1999; McBride & Midford, 1999).

While it is difficult to measure the effect of a system oriented, multi-component intervention, researchers concur that a whole-of-school approach that recognizes the social environment of the student is required to achieve positive change (Mooij, 1993; Olweus, 1991; Vreeman & Carroll, 2007; Whitney et al., 1994). This efficacy trial attempted to test many promising strategies that form part of a whole-school approach, operationalised from the validated Principles of Successful Practice for Bullying Prevention in Schools (Cross et al., 2004). However, this 'kitchen sink' approach and study design means it is not possible to discern which components of a whole-school approach were more effective than others (Farrington, 1993).

The impact of the whole school FS strategies varied as a function of the reach and impact of each strategy and the potential for synergy across these strategies. We systematically measured the extent to which the intervention activities at the classroom, home and school level were implemented as intended. These integrity data were collected using teacher lesson logs, teacher and whole-of-school coordinator interviews, student workbooks, and parent questionnaires for recognition of home activities and whole-of-school strategies. These process data suggest that more of the classroom curriculum was implemented than any other component.

Strengths and limitations

These findings however, must be considered in the context of this study's methodological limitations. Despite stratified random allocation of schools to condition, at baseline the comparison students were less likely than intervention students to report seeing bullying in their school, they were also more likely to attend smaller schools, and their parents were more likely to have higher levels of education.

Although careful follow-up strategies were conducted to maximise student response rates, attrition limits the findings of this study with a loss of approximately 30% of the student respondents over the three years. While our power calculations accounted for a 10% student loss in the first two study years, this attrition may have resulted in lower estimates of bullying than would otherwise be the case. Similar to other research, this study found that regularly bullied students and those least likely to tell if they were bullied were more likely to be lost-to-follow-up (Zubrick et al., 1997). This limitation is somewhat mitigated nonetheless by the randomised group design and the finding of no differential attrition for the outcome variables between study groups.

This study's findings may also be biased by shared method variance as student self-report questionnaires were used to measure both the dependent and independent variables. While self report is used in most studies evaluating anti-bullying behavioural interventions (Vreeman & Carroll, 2007) it does not correspond well with peer, parent and teacher reports. Ideally, multiple informants should be used in the measurement of bullying (Wienke Totura, Green, Karver, & Gesten, 2009). However, while peer nominated bullying behaviour would have improved the validity of this study, Salmivalli (2001) found that self-report bullying behaviour is more responsive to intervention than peer nomination, due to reputational bias (Hymel et al., 1990).
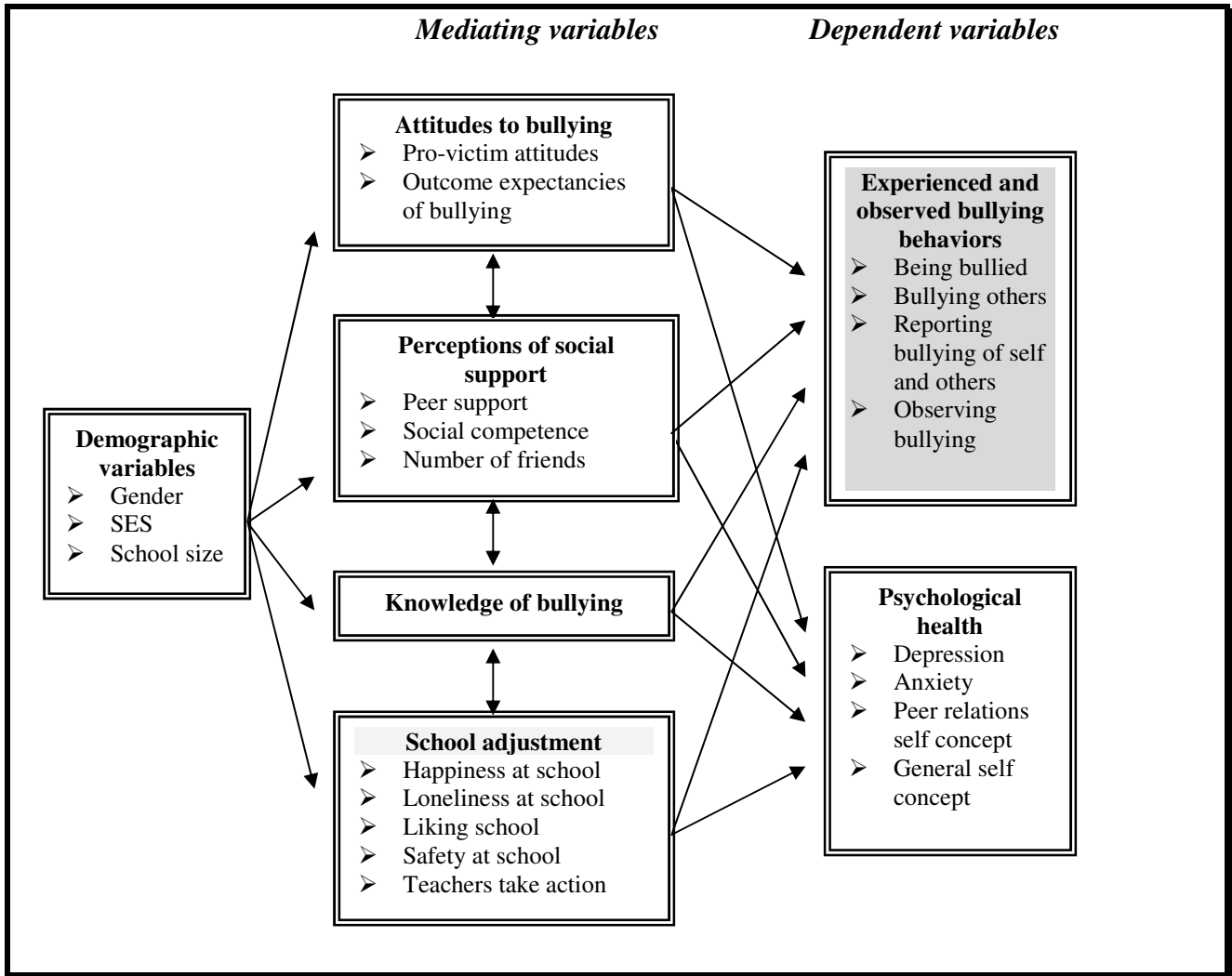
A major strength of this study was its randomised group (schools) to treatment condition design (which included a comparison group), with schools stratified by school size and socioeconomic status to enhance their representativeness, as well as its three-year longitudinal design. Card and Hodges (2008) noted that much intervention research is methodologically flawed by lack of control conditions or random assignment. Smith and colleagues' review (2004a) found only four whole-of-school anti-bullying controlled studies with random assignment to group, whereas Vreeman and Carroll (2007) found only two of the ten whole-school intervention studies (Mitchell, Palmer, Booth, & Powell Davies, 2000; Roland, 2000) incorporated randomization in their study design. Moreover, in the present study, sample representation was maintained with all 29 schools invited agreeing to participate (no refusals) and remaining in the study for the full three years. This study also had adequate power to detect moderate effects. Lastly, the analyses adequately accounted for the clustered design as the inherent hierarchical nature of school-based data can lead to aggregation bias (Goldstein, 1995) and Type I error (Murray, 1998).

Conclusion

Taken together these findings provide support for the mounting evidence that when whole-of-school programs are carefully designed and implemented and involve students in their different social contexts, they can reduce children's experiences of bullying behaviour and increase the likelihood of them telling someone if they are bullied. Future research is required to clarify optimal combinations and dose of universal, selective and targeted intervention components at the student, classroom, home and whole-school levels, and to identify barriers to implementation and ways of building school capacity to surmount these.

Figure 1

Theoretical Model for the *Friendly Schools* Project

| | Mediating variables | Dependent variables |

Attitudes to bullying
➢ Pro-victim attitudes
➢ Outcome expectancies of bullying

Perceptions of social support
➢ Peer support
➢ Social competence
➢ Number of friends

Demographic variables
➢ Gender
➢ SES
➢ School size

Knowledge of bullying

School adjustment
➢ Happiness at school
➢ Loneliness at school
➢ Liking school
➢ Safety at school
➢ Teachers take action

Experienced and observed bullying behaviors
➢ Being bullied
➢ Bullying others
➢ Reporting bullying of self and others
➢ Observing bullying

Psychological health
➢ Depression
➢ Anxiety
➢ Peer relations self concept
➢ General self concept

Note. Shaded region represents the outcome variables addressed in this paper.

Table 1

Friendly Schools study design

Study Condition	Baseline Grade 4 (Mar 2000)	Intervention (year 1)	Posttest 1 Grade 4 (Nov 2000)	Intervention (year 2)	Posttest 2 Grade 5 (Nov 2001)	Maintenance	Posttest 3 Grade 6 (Nov 2002)
Intervention	O_1	X_1	O_2	X_2	O_3	X_3	O_4
Comparison	O_1	X_4	O_2	X_5	O_3	X_6	O_4

Note.

O= Student cohort data collection

$X_{1,2}$ = Whole-of-school bullying intervention (active school support and training)

X_3 = Maintenance of whole-of-school bullying intervention (passive school support)

$X_{4,5}$ = Regular school bullying prevention program and road safety curriculum

X_6 = Regular school bullying prevention program and road safety curriculum PLUS release of $X_{1,2}$ to schools

Table 2

Response rates of the longitudinal cohort of students from baseline to posttest 3

	Baseline	Posttest 1	Posttest 2	Posttest 3

| | (March 2000) | (Nov 2000) | (Nov 2001) | (Nov 2002) |
	n (%)	*n (%)*	*n (%)*	*n (%)*
Intervention	1,046 (100)	984 (94.1)	861 (82.3)	688 (65.8)
Comparison	922 (100)	863 (93.6)	775 (84.1)	688 (74.6)
Total	1,968 (100)	1,847 (93.9)	1,636 (83.1)	1,376 (69.9)

Table 3

Baseline demographic differences between intervention and comparison groups

	Gender (Female) *n (%)*	Parent has university education[a] *n (%)*	Age *Mean (SD[†])*	School size[‡] *Mean (SD[†])*
Intervention	531 (51.1%)	111 (14.1%)	8.57 (0.548)	658.6 (188.7)
Comparison	443 (48.3%)	164 (24.1%)	8.55 (0.546)	633.2 (165.0)
	χ^2 (1, n = 1,956) = 1.5, p = .217	χ^2 (3, n = 1,468) = 27.3, p = .000	t = 0.8, p = .446	t = 3.2, p = .001

Note. [a] Parent who responded to survey, most often the mother

† Standard deviation

‡ Number of students in school

Table 4

Student baseline report of being bullied, bullying others, telling if bullied and seeing another

Grade 4 or younger student bullied during last term

Bullying outcomes	Frequency	Intervention		Comparison		Total		p value
		n	*(%)*	*n*	*(%)*	*n*	*(%)*	
Was bullied	Every few weeks or more often	168	(16.1)	152	(16.6)	320	(16.3)	.841
	1-2 times a term	262	(25.1)	220	(24.0)	482	(24.6)	
	Not at all	615	(58.9)	546	(59.5)	1,161	(59.1)	
	Total	1,045	(100)	918	(100)	1,963	(100)	
Bullied others	Every few weeks or more often	27	(2.6)	28	(3.0)	55	(2.8)	.403
	1-2 times a term	108	(10.4)	111	(12.1)	219	(11.2)	
	Not at all	903	(87.0)	780	(84.9)	1,683	(86.0)	
	Total	1,038	(100)	919	(100)	1,957	(100)	

Told if bullied	Told someone/ Was not bullied	889	(85.7)	778	(84.7)	1,667	(85.2)	.505
	Told no-one	148	(14.3)	141	(15.3)	289	(14.8)	
	Total	1,037	(100)	919	(100)	1,956	(100)	
Saw another bullied	Did not see	(531)	51.2	(516)	56.8	(1,047)	53.8	**.013**
	Saw	(506)	48.8	(392)	43.2	(898)	46.2	
	Total	(1,037)	100	(908)	100	(1,945)	100	

Table 5

Binary logistic regression results for student responses to how often *they were bullied* and

bullied others last term

Time point	Outcome category	Odds Ratio[a]	95% Confidence interval	*p* value[b]	Effect s
Posttest 1 *n* =1,834	*Bullied* every few weeks vs. Less often/Not	1.16	(.87 ; 1.54)	.323	-4.3%
	Bullied vs. Not at all	1.49	(1.14 ; 1.94)	**.004**	-16.2%
Posttest 2 *n* =1,624	*Bullied* every few weeks vs. Less often/Not	1.00	(.70 ; 1.43)	.996	0.6%
	Bullied vs. Not at all	1.25	(.95 ; 1.64)	.117	-8.3%
Posttest 3 *n* =1,359	*Bullied* every few weeks vs. Less often/Not	1.50	(1.10 ; 2.05)	**.010**	-30.6%
	Bullied vs. Not at all	1.26	(.93 ; 1.71)	.133	-38.5%
Posttest 1 *n* = 1,827	*Bullied others* every few weeks vs. Less often/Not	.66	(.39 ; 1.13)	.134	39.3%
	Bullied others vs. Not at all	.81	(.54 ; 1.20)	.295	9.3%
Posttest 2 *n* = 1,613	*Bullied others* every few weeks vs. Less often/Not	1.14	(.71 ; 1.83)	.580	-17.9%
	Bullied others vs. Not at all	1.15	(.81 ; 1.63)	.432	-9.3%
Posttest 3 *n* = 1,357	*Bullied others* every few weeks vs. Less often/Not	.87	(.48 ; 1.59)	.657	39.3%

Bullied others vs. Not at all	1.02	(.75 ; 1.40)	.890	3.6%

Note.

[a] Odds for comparison vs. intervention group adjusted for values for dependent variable at

  baseline, gender and school size.

[b] Bonferroni adjusted level of significance for group comparisons $\alpha = .025$

[c] Effect size calculated as difference in intervention and comparison rates at posttest expressed

as a percentage of the average baseline rate across the two groups.

Table 6

Binary logistic regression results for student responses to whether *they told someone if bullied*

and *if they saw someone being bullied*

Time point	Outcome category	Odds Ratio[a]	95% Confidence interval	*p* value[b]	Effect s
Posttest 1 *n* = 1,823	Told no-one if bullied vs. told someone/wasn't bullied	1.60	(1.12 ; 2.13)	**.001**	-30.4%
Posttest 1 *n* = 1,813	Saw someone being bullied/didn't see	1.36	(1.03 ; 1.81)	**.031**	-10.7%
Posttest 2 *n* =1,617	Told no-one if bullied vs. told someone/wasn't bullied	1.28	(.95 ; 1.74)	.105	-17.6%
Posttest 2 *n* =1,605	Saw someone being bullied/didn't see	1.48	(1.14 ; 1.92)	**.003**	-16.5%
Posttest 3 *n* =1,355	Told no-one if bullied vs. told someone/wasn't bullied	1.29	(.94 ; 1.77)	.118	-16.2%
Posttest 3 *n* = 1,350	Saw someone being bullied/didn't see	1.67	(1.25 ; 2.24)	**.001**	-21.5%

Note.

[a] Odds ratios adjusted for values for dependent variable at baseline, gender and school size.

[b] Bonferroni adjusted level of significance for group comparisons $\alpha = .025$

[c] Effect size calculated as difference in intervention and comparison rates at posttest

expressed as a percentage of the average baseline rate across the two groups.

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