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It is risky business: can social capital reduce risk-taking behaviours among disadvantaged youth?

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ABSTRACT

This study addresses the gap in the research for sound multidimensional assessment of social capital and its relationship with risk-taking behaviour among youths living in disadvantaged communities. Social capital and adolescent risk-taking outcomes were studied cross-sectionally in 1371 secondary students living in two disadvantaged communities within Australia. First, a multidimensional measure of social capital was developed and tested using confirmatory factor analysis. Then, the associations between social capital and a range of youth risk-taking behaviours were examined using structural equation modelling across five-year groups (Grades 7–12). With a few exceptions, higher levels of social capital and belongingness within the school and community were generally associated with decreases in smoking, alcohol and drug consumption, and physical violence. Some outcomes were more strongly associated with family and peer social capital, while others associated more with neighbour and community social capital, indicating that attempts to build social capital need to be targeted across the whole community. This study supports the notion that social capital can be measured empirically and is beneficial in alleviating many of the detrimental health outcomes commonly associated with risk-taking behaviours during adolescence.

Globally, unintentional injury causes more adolescent deaths, disabilities, and hospitalisations than all other causes combined (CARRS-Q, 2010; World Health Organisation (WHO) 2015), with adolescents accounting for almost 35% of the global burden of disease and disability. While the latest report from the Australian Institute of Health and Welfare (AIHW 2011) indicates a substantial decline in the number of risk-related deaths for young people over the last decade, there is still much work to be done in a number of areas with data showing rising rates of sexually transmissible infections (STIs), alcohol and drug-related violence, and transport accidents. This same trend has been recorded worldwide. For example, the number of adolescents contracting HIV has tripled since the year 2000 becoming the second leading cause of death among teens (WHO 2015). Reviews of existing intervention methods such as policy changes (e.g. alcohol and

tobacco reduction strategies – increased pricing and access restrictions), mass media campaigns (e.g. advertisements showing the detrimental effects of drug and tobacco use), school-based information sessions (e.g. sexual health seminars), and family education (e. g. informational websites for parents) have produced mixed findings with the general consensus being that a multifaceted intervention approach would be most effective (Jackson et al. 2012).

One facet that has been largely overlooked by many of these mainstream approaches is the importance of the social environment in which adolescents are embedded and how their social networks can influence their behaviour (Jackson et al. 2012). Emphasising the significance and quality of teenagers' social networks, Freiberg and Lapointe's (2006) comprehensive review of the programmes and interventions designed to reduce problematic and risk behaviours in adolescents found that the most successful programmes were those moved beyond punitive measures and incorporated elements aimed at building connectedness and caring relationships within the school. More recently, in their review, Jackson et al. (2012) concluded that due to the multitude of influences that adolescents are regularly exposed to, we need to look beyond traditional interventions as the only solution to the problem and be careful not to overlook the social determinants and contexts that impact on adolescent behaviours. In support of this view, other research has highlighted the importance of the social environment within the family, peer group, neighbours, and community in reducing risk-taking behaviours among youth in the form of social capital (e.g. Miller, Benson, and Galbraith 2001; Browning, Leventhal, and Brooks-Gunn 2004).

Social capital is defined as 'the connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them' (Putnam 2000, 18). The central premise of the construct is that social relationships have value, and provide a resource that can be drawn upon to enhance one's social, psychological, physical, and economic functioning. Social capital has been widely seen as a potential solution to many of the problems facing socially and economically disadvantaged communities and proponents of the construct claim that it has the potential to make us 'smarter, healthier, safer, richer … ' (Putnam 2000, 290). Theoretical conceptions of social capital suggest that it operates at multiple levels within the social structure, with bonding (social connections among family and friends), bridging (social connections among neighbours and work colleagues), and linking (social connections formed across power hierarchies, e.g., students & teachers) being the most commonly cited in the literature (Gittell & Vidal, 1998; Putnam 2000; Stone and Hughes 2002; Van Deth 2003). As such, this multilevel characterisation was adopted in the present investigation.

While there have been a number of advances in social capital theory and research of heuristic value over the last two decades, this field of research is often plagued with theoretical and methodological issues that have hampered its progress. The quality of the existing research has been questioned and there still remains a lack of consensus among researchers and policy-makers on how social capital can be best utilised to enhance social, physical, and economic well-being, particularly for those living in poor communities (Sabatini 2009). Therefore, before governments and other non-governmental organisations (NGOs) can be persuaded to invest substantial funding to implement social capital interventions, there are a number of barriers that need to be overcome. The present study attempts to address these obstacles by unifying the social capital literature

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and developing a theory-driven measure of the construct in order to assess the true worth of positive social networks in reducing risk-related behaviours among adolescents.

Barriers to social capital research and intervention

Barriers to progression of social capital research and subsequent intervention include theoretical imprecision and atheoretical approaches (Stone and Hughes 2002; Van Deth 2003), definitional and conceptualisation difficulties (Putnam 2000), problems in understanding the structure and nature of social capital, and how best to measure it (Portes 1998; Stone 2001; Van Deth 2003). There are also inconsistencies and contradictory research findings when attempting to ascertain the relation between social capital and desirable outcome measures (e.g. Thompson and Krause 1998; Leeder and Dominello 1999; Pearce and Smith 2003). As such, the literature relating to social capital has remained complex, varied, and often tautologous such that clear ways to advance this field of research have remained elusive (Stone 2001). Hence researchers need to first establish sound definitions and measures of the social capital construct to determine how best to utilise it to benefit those most marginalised in the current social structure.

Limitations in the research investigating social capital among young people

In addition to the problems outlined above, there are a number of limitations exclusively associated with social capital research conducted with children and youth. First, as pointed out by Schaefer-McDaniel (2004), it is common practice to ask parents and teachers about children's and adolescents' social networks rather than collecting the information directly from the source. Assuming that adults can accurately account for a young person's perceptions of their social environment is problematic and needs to be addressed in order to determine the true value and impact of social relationships in a young person's life (Schaefer-McDaniel 2004).

Second, when researchers do ask young people directly about their stocks of social capital, there is an assumption that their social capital is simply the product of their parents' social networks. For example, when assessing levels of social capital among Australian children and youth, Marjoribanks (1998) defined childhood social capital in terms of 'parents' aspirations for their children, and parents' individualistic orientations and involvement, intellectual ability, and academic achievement and youth social capital in terms of their social relationships with adults while their social interactions with other young people were ignored (Schaefer-McDaniel 2004, 159). Such research neglects the importance of young people's independent pursuit of social relations among their peers and the mutual benefit that can be drawn from them. The current research addresses both of these limitations by collecting data directly from the youth participating in the research and acknowledging young people's agency by measuring their stocks of social capital with both peers and adults.

The link between social capital and risk-taking behaviours

Developmentally, adolescence is a challenging period characterised by increased levels of curiosity and self-doubt. Thus, there is a heightened potential for engaging in risk-related

activities among this age group (Smylie, Medaglia, and Maticka-Tyndale 2006). Risk-taking refers to the 'tendency to engage in behaviours that have the potential to be harmful or dangerous, yet at the same time provide the opportunity for some kind of outcome that can be perceived as positive' (Tull 2014, n.p.), such as experiencing a rush of adrenaline when driving dangerously. Risk-taking behaviours among youth, such as smoking, drinking, drug taking, and unsafe sexual practices, can all have an adverse impact on adolescent health. These may be observed in terms of unwanted pregnancy, contracting STIs, an increased risk of injury and death, and acute and chronic diseases (Smylie, Medaglia, and Maticka-Tyndale 2006). The following review of the existing literature examines the impact of social capital at multiple levels across the social structure (e.g. family and neighbour) on adolescents' risk-taking behaviours.

The impact of proximal social networks on risk behaviours

Over the last two decades a number of studies have begun to identify sources of social capital that can reduce risk-taking behaviours among youths. For example, research has found that adolescents who have supportive parent–child relationships with open lines of communication reported lower levels of drug use (e.g. Stronski et al. 2000), were less likely to engage in sexual relations (Karofsky, Zeng, & Kosorok, 2000; Whitaker and Miller 2000), and had a lower risk of unwanted pregnancy (Miller, Benson, and Galbraith 2001) than adolescents who reported tumultuous relationships with their parents. **AQ3**

Likewise, studies examining peer relations as sources of social capital have illustrated that risk-taking behaviour can be encouraged or discouraged depending on the nature of peer norms (Portes 1998; McNeely and Falci 2004). For example, research has shown that peer group norms which advocate unsafe sexual practices tend to reinforce unsafe sexual behaviour (South and Baumer 2000; Kirby 2001;), whereas those that endorse more sexually healthy practices minimise risky sexual behaviour among their friendship group (Browning, Leventhal, and Brooks-Gunn 2004). While early research consistently showed that social involvement with delinquent peers is positively associated with delinquent behaviour (e.g., Marcos, Bahr, and Johnson 1986), more recent research suggests that these relations are far from straightforward, and falling into a 'bad crowd' does not inevitability mean that adolescents will engage in the same risk-taking activities (Smylie, Medaglia, and Maticka-Tyndale 2006). It has been shown that existing family values and norms can moderate the associations found in previous research and that youth are influenced by both their peer and family values, depending on their different needs (Watts and Nagy 2000).

The impact of distal social networks on risk-taking behaviours

In addition to family and peer social capital, social capital arising from schools, neighbours, and involvement in sports clubs and religious institutions can also influence levels of risk-taking among adolescents (Coleman 1988). Research has shown that students with a strong connection to their teachers and school, along with a high level of commitment to their education, are significantly less likely to engage in smoking, drug use, alcohol consumption (Marcos, Bahr, and Johnson 1986), and unsafe sexual practices (Dorius, Heaton, and Steffen 1993). For example, McNeely and Falci (2004) found that positive student–

teacher relations decreased the likelihood of engaging in unsafe sexual practices, weapon-related violence, suicide (attempts and ideation), smoking, getting drunk, and marijuana use.

Research investigating the relations between adolescent religious involvement and risk-taking behaviour has consistently shown that involvement in religious activities decreases the likelihood of engaging in risky behaviours, and this relation may be even stronger if the youth's parents are also involved in the church (Merrill, Salazar, and Gardner 2001). It appears that by immersing adolescents in institutions and groups that frown upon risk-taking behaviours they are encouraged to adopt the same positive values and norms, enabling them to develop relationships built on trust and reciprocity. These same principles have been applied to involving youth in sporting teams, which has also been shown to decrease risk-related behaviour in Brazilian adolescents (Anteghini et al. 2001).

Researchers have also become increasingly interested in the protective benefits of per-ceived neighbour social capital on health outcomes, but few have investigated this in relation to risk-taking behaviour among adolescents. One exception was a study con-ducted by Boyce et al. (2008). An advantage of this study over others is that the measure used for neighbour social capital consisted of five items encompassing a number of the prescribed theoretical elements of social capital. While this potentially strengthens the validity of their findings, all data were gathered from a secondary source (Health Behaviours of School Children [HBSC]; e.g. Currie, Gabhainn, and Godeau 2009) not initially designed to measure social capital. Hence despite improving on the single-item measures more often used, implications from a social capital perspective are inevitably restrictive in nature. Nevertheless, the finding demonstrating that adolescents with the lowest perceived levels of neighbour social capital were the most likely to engage in frequent risk behaviours clearly calls for attention. Furthermore, the results showing that students with the lowest family affluence scores were also the ones that engaged in the most risk-related behaviours also supports the link between economic dis-advantage and increased risk-taking.

The impact of demographics on risk-taking behaviour and social capital

Risk-taking behaviour appears to differ across gender (Smylie, Medaglia, and Maticka-Tyndale 2006; Sweeting and West 2003). For example, Boyce et al. (2008) found that males were more likely to engage in risk-taking than were females (with the exception of tobacco use), although this disparity was only evident among younger adolescents. Other research has shown that females report feeling less pressure from peers to engage in sexual activity than do males (De Gaston, Weed, and Jensene 1996), despite per-ceiving a greater portion of their peers to be having sexual intercourse and using birth control (De Gaston, Weed, and Jensen 1996). An early study by Brown, Clasen, and Eicher (1986) also established that males are more likely than females to respond to peer pressure and engage in sexual activity in order to conform to peer group norms and values.

Smylie, Medaglia, and Maticka-Tyndale (2006) examined risk-taking behaviour in Cana-dian males and females aged 15–19 years. In an attempt to integrate social capital theory into the research, Smylie et al. also aimed to compare and contrast the three prominent

theories put forth by Bourdieu (1986), Coleman (1988), and Putnam (2000) to determine
which best predicts adolescent risk-taking. Drawing on Bourdieu's emphasis on forming
valuable networks, his theory was operationalised as participants' spoken language, immigrant status, frequency of contact with close friends, and involvement in a volunteer
organisation. With Coleman's theory stressing the importance of the family and religious
affiliation, his interpretation was measured using questions about family composition and
frequency of church attendance. Finally, Putnam's theory which focuses on group participation was measured by participation in the labour force, church, school, sports teams,
and volunteer organisations.

The initial demographic results revealed that race and income were significant predictors of risk-taking behaviour. However, when Coleman's predictors were introduced into
the model for males the explanatory effect of income disappeared entirely, suggesting
that levels of family social capital can moderate the association between income and
risk behaviour. Regional differences also no longer affected behavioural risk in males
after adding Putnam's predictors. This again suggests that social capital can moderate
these effects. Once Bourdieu's predictors were added (language and race), there was a
decrease in the effect size of race for females, although this result was not as strong for
males. However, most influential for reducing risk behaviours among females was participation in community groups. Overall, it was concluded that levels of social capital had the
strongest influence over male risk behaviour, while still exerting a positive influence on
females. It appears that for males, networks formed within the home are more influential
than those created elsewhere, and therefore Coleman's theory had the strongest predictive power for males. In contrast, the authors concluded that for females, Putnam's model,
and the importance of group membership, had the strongest predictive power over
female risk behaviour, while Coleman's had the least. This indicates that for females,
social groups within the community appear more important than those within the family.

Despite these interesting findings, there were a number of limitations associated with
the Smylie, Medaglia, and Maticka-Tyndale's (2006) study. First, the data used were gathered from a secondary source that was adapted to correspond to a proxy of social capital
rather than a direct measure of the construct. Second, the use of demographic items such
as language spoken at home and racial background does not capture Bourdieu's theory
adequately, which may explain the lack of significant associations found between his
theory of social capital and risk-taking behaviours. Finally, social capital research has highlighted the importance of the quality of networks (Antonucci, Fuhrer, and Dartigues 1997;
Ryan and Willits 2007), which the Smylie et al. investigation did not measure. This is important as research has shown that in addition to establishing networks across all levels of the
social structure (bonding, bridging, and linking), ensuring that these networks translate
into perceptions of belonging is crucial for young people (Schaefer-McDaniel 2004;
Magson, 2013). When defining social capital in the context of young people, Schaefer-McDaniel (2004) builds on the theories of Bourdieu, Coleman, and Putnam stating that
in addition to networks, trust, and reciprocity, a sense of belonging/place attachment is
a necessary component of any social capital definition involving young people.

In support of this view, a strong sense of belonging in the schooling context has been
shown to be an important determinant of positive schooling outcomes, in contrast, those
students who feel socially isolated at school are more likely to perform poorly at school,
suffer from higher incidence of mental health problems (Magson, Craven, and Bodkin-

Andrews 2014), and encounter significant barriers in accumulating social capital outside the family (Magson 2013). Therefore, it is possible that a sense of belonging within the school community may also be associated with reduced risk-taking, while feeling socially isolated may result in increased risk behaviours.

Regardless of these methodological limitations in the Smylie, Medaglia, and Maticka-Tyndale's (2006) study, it was one of the few studies that have attempted to advance theory in this area. Furthermore, the finding that social capital accounted for as much or more of the variation in multiple risk-taking behaviours than did demographic items is important as it challenges the existing prevention strategies used to reduce adolescent risk-taking behaviour, which are mostly based on socio-economic factors (Smylie, Medaglia, and Maticka-Tyndale 2006).

The present study

Despite recent advances in social capital research, there remains a need to disentangle the relations between social capital and the host of other variables that can impact on adolescent health. In order to move forward, researchers need to measure more directly social capital factors that are clearly linked to theory so that the potential benefits of social capital can be fully developed. Despite the limitations in measurement, the research presented above collectively demonstrates that adolescents living in poor communities have the lowest levels of social capital, and are more prone to taking risks with their lives than their more affluent counterparts with high levels of social capital. However, by the same token, this also suggests that increased levels of social capital and social integration can potentially narrow the gap in health outcomes and risk-taking between disadvantaged and non-disadvantaged youths.

The main goals of the present investigation were to contribute to disentangling the key aspects of social capital through improved measurement and to explore the impact of multiple levels of social capital on risk-taking behaviours among disadvantaged youth. Additionally, building on the work of Smylie *et al* (2006), the current study also measured levels of belonging and isolation in the schooling context to determine whether youth's social networks translate into feeling like they belong and how these perceived levels of social integration are related to levels of risk-taking. Using confirmatory factor analysis (CFA), we examined a new theoretically derived social capital measure based on a clear and simple definition which encapsulated the key elements found in many of the competing definitions of the construct. Given the paucity of reported reliable and valid instrumentation utilised in social capital research, the fulfilment of this goal can make a significant and vital contribution to advancing future social capital research from a measurement perspective. Specifically we attempted to develop a multi-item social capital and social integration measure that incorporates both theory and all conceptualised dimensions of social capital described in the literature.

We then applied structural equation modelling (SEM) to investigate the relations between social capital factors and risk-taking behaviours among disadvantaged adolescents using the newly developed social capital measure. This is important because if quality social networks can be successfully used as a resource in reducing risk behaviours, new policy approaches can be developed focusing on strengthening social networks across the social sphere, rather than relying predominantly on scare campaigns and

punitive measures to assist those engaging in such behaviours. Due to the limited research in this area of study the following research questions were posed: (1) Is the newly developed measure of social capital psychometrically sound and valid for use across different gender and regional groups? (2) What types of social capital are most beneficial in reducing risk-taking behaviours in adolescents living in disadvantaged communities? and 3) Does a sense of belonging or isolation at school effect levels of risk-taking?

Method

Participants

Participants were a purposefully selected sample of secondary students living in two disadvantaged communities (based on Vinson's 2007 Disadvantage Index, and the Socio-Economic Indexes for Areas) within Australia. The total sample comprised a range of cultural and linguistic backgrounds, as well as a representative gender mix. There were large cultural and locality differences between the two communities. Oceanview (pseudonyms for each community have been used to maintain anonymity) is located in a beach side rural town, whereas Multiville is located in an urban area within a major Australian city. Furthermore, Multiville is made up predominantly of residents from a non-English-speaking background, while Oceanview residents come from a primarily Caucasian background. A total of four government secondary schools agreed to participate. The total sample of 1371 comprised male ($n = 840$) and female ($n = 531$) secondary students (Years 7–12) with ages ranging from 12 to 17 years. Of the total sample, 78.8% were born in Australia. Almost 30% of the Multiville sample was born overseas; in comparison, only 6.5% of the Oceanview sample was born outside of Australia. With the exception of those not providing consent (<3%), all students from each year group (Years 7–12) were surveyed with slightly larger numbers in the lower secondary years (Years 7 and 8) than the upper (Years 11 and 12) across the four schools surveyed.

Measures

Social capital

Levels of social capital were measured using the Social Capital and Cohesion Scale (SCCS; Author 1, Author 2, and Bodkin-Andrews 2014). The SCCS consists of 29 positively worded items arranged into six factors (see Figure 1). As shown, four of the six factors consisted of: family social capital (six items, e.g. 'I trust my family'); peer social capital (five items, e.g. 'I can depend on my friends for help when I need it'); neighbour social capital (six items, e.g. 'My neighbours would help me in an emergency'); and community social capital (six items, e.g. 'I'm happy to work with people in my community to improve it' and 'the police in my local area are trustworthy'). In the current research, neighbours were defined as a group of potentially socially interactive people that reside in close proximity to one another in a limited geographical space that is part of a larger community (Chaskin 1997). And although there are numerous definitions of community (e.g. community of interest and virtual community), the current research adopted the spatial paradigm which views community as a spatially defined small town (in rural areas) or suburb (in urban areas; Johnson, Headly, and Jenson 2005).
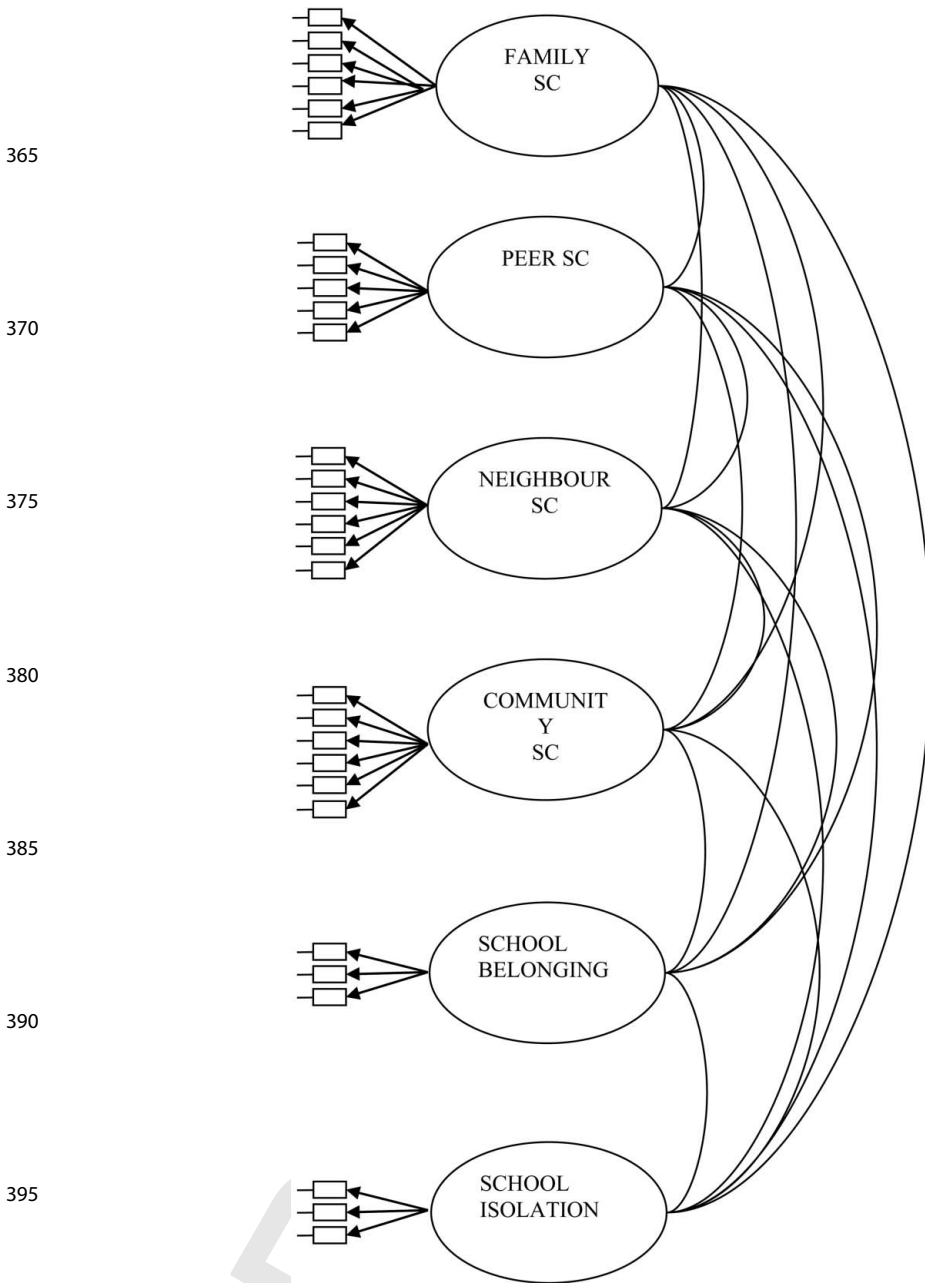
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Figure 1. Pictorial representation of the final social capital and cohesion scale.
Note: SC = social capital.

As highlighted in the literature, an important element of social capital which is often overlooked is the quality of one's social networks (Antonucci, Fuhrer, and Dartigues 1997; Ryan and Willits 2007). As such, it was deemed necessary to include factors assessing levels of social integration into the model. Previous research found that a sense of belonging or isolation within the school had the strongest association with multiple outcomes in

adolescents, whereas a sense of belonging or isolation at the community level produced much weaker associations (Magson 2013). Follow-up qualitative findings revealed that the primary reason for this was that teens considered the school environment to be their primary contact with the community and the environment outside of the school had little additional impact on their thoughts, feelings, and behaviours. Quantitative studies have also evidenced a strong association between young people's self-esteem and their self-concept at school (e.g. Marsh and Yeung 1999; Arens et al. 2013), demonstrating the significance of the school environment to young people. Hence only two additional factors labelled School Belonging (three items, e.g. 'My school is a place where I feel like I belong'), and School Isolation (e.g. 'My school is a place where I feel lonely'), adapted from the Program for International Student Assessment (PISA) survey (OECD 2003), were integrated in to the SCCS model. All items were subsequently measured on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The psychometric strength of the new SCCS measure is reported in the results section.

Risk behaviours

To measure youth risk-taking, the current research utilised selected variables from the Health Behaviour of School Children survey (Roberts et al. 2009). The HBSC is a self-report measure designed to target school children aged 11–15 years and is currently being used in a longitudinal international study across 41 countries worldwide. The HBSC items measured a number of risk-taking behaviours such as smoking tobacco (e.g. 'How often do you smoke cigarettes?'), alcohol use (e.g. 'How often do you drink the following alcoholic drinks?'), cannabis use (e.g. 'Have you had cannabis in the last 30 days?'), and physical violence ('How many times in the last 12 months have you been involved in a physical fight?'). Haugland and Wold (2001) state that the HBSC demonstrates good face validity and acceptable test–retest intra-class correlation coefficients (ICC) ranging from .76 to .79.

Procedure

Ethics approval was sought and subsequently obtained from the University of Western Sydney Human Ethics Committee and the New South Wales Department of Education and Training. The principals of potential participating schools were then emailed and followed up a week later with a telephone call from the research team. Information meetings were held with principals wishing to participate, and parent consent and information forms were distributed and then collected by the school staff. On the day of the data collection, students without parental consent were sent to their classrooms and given alternative activities to perform. Students with parental consent were instructed verbally of the purpose of the study, of their voluntary and anonymous participation, and their right to withdraw at any time with lack of penalty. Active written consent was also obtained from the participating students prior to the commencement of the questionnaire. All participants were then required to complete a questionnaire which was group administered in their school's hall. To overcome any reading or language difficulties, the questionnaire was read aloud to secondary school students in their year groups by a trained research assistant with the survey taking approximately 25 minutes to complete. This process was repeated at each of the four participating schools.

Statistical analysis

Reliability analyses

Reliability analyses, using Cronbach's alpha, was conducted for each of the subscales of the SCCS using SPSS 21.0. Although there is no universal consensus regarding acceptable reliability values, a Cronbach's alpha value of .70 is usually used as a point of reference (see Tabachnick and Fidell 2012). However, lower values (e.g. .60 or above) are also accepted by many researchers (e.g. Garson 2012; Nunnaly 1978).

Confirmatory factor analysis (CFA)

A CFA was conducted to validate the factor structure of the SCCS using the LISREL software (Joreskog and Sorbom 2006). In evaluating the model fit, the Root Mean Square Error of Approximation (RMSEA); the Tucker Lewis Index (TLI); and the Comparative Fit Index (CFI) were emphasised (Byrne 2001). For the RMSEA, conventionally values below .050 represent excellent fit and values up to .070 –.080 indicate good/acceptable fit, although cut-off values may be arbitrary (see Chen et al. 2008 for a discussion). For the TLI and CFI, values greater than .95 are indicative of excellent fit, and values greater than .90 are indicative of good/acceptable model fit (Schumacker and Lomax 1996).

Structural equation modelling (SEM)

SEM was utilised to assess the relation between types and levels of social capital and risk-taking behaviours. SEM is a statistical technique for testing the hypothesised predictive relations between observed and latent variables and is able to bring together the features of factor analysis, regression, and path analysis into one cohesive statistical application (Byrne 1998). Additionally, unlike more traditional multivariate techniques that are unable to assess or correct for measurement error, SEM provides explicit estimates of error terms associated with both the endogenous latent variables and the observed indictors (Byrne 1998). Through multiple regression analyses, SEM tests the structural associations between both the latent and observed variables simultaneously, allowing the researcher to refine, revise, and reconstruct the theoretical model (see Tabachnick and Fidell 2012 for a detailed explanation). The same CFI, TLI, and RMSEA criteria as that outlined above were used to assess model fit.

Results

This section first reports the reliability results of the SCCS. Then the relations between social capital and risk behaviours are examined through SEM for the total sample. This will be followed by SEM moderating analyses in order to investigate whether the associations between social capital and engagement in risk behaviours vary as a function of gender and/or region.

Reliability

Internal consistency coefficients are given in Table 1. For the total sample, all scales showed acceptable Cronbach's alpha values ranging from .70 to .89. Also given in Table 1, reliability coefficients were calculated separately for gender and regional groups. All

Table 1. Reliability estimates (α) and confirmatory factor analysis results for the social capital and cohesion scale.

Cronbach's alpha (α)

Scale		Total sample ($n = 1371$)	Males ($n = 840$)	Females ($n = 531$)	Oceanview ($n = 478$)	Multiville ($n = 893$)	No. of items
	Family SC	.87	.89	.86	.86	.88	6
	Peers SC	.82	.80	.79	.85	.80	5
	Neighbour SC	.89	.88	.90	.89	.89	6
	Community SC	.70	.71	.68	.78	.68	6
	Belonging	.78	.79	.75	.78	.78	3
	Isolation	.74	.72	.77	.77	.72	3

Confirmatory factor analysis results

	Family SC	Peer SC	Neighbour SC	Community SC	Belonging SC	Isolation SC
Items	*Factor loadings*					
1	.63	.79	.80	.47	.77	.79
2	.81	.67	.81	.55	.71	.59
3	.81	.71	.81	.47	.73	.73
4	.76	.68	.71	.67	–	–
5	.77	.61	.68	.46	–	–
6	.67	–	.71	.59	–	–
Factor correlations						
Family	–					
Peers	.48	–				
Neigh	.32	.35	–			
Community	.42	.47	.60	–		
Belonging	.33	.44	.46	.49	–	
Isolation	−.31	−.26	−.20	−.19	−.41	–
Model fit						
N	χ^2	df	TLI	CFI	RMSEA	
1371	1231.12	362	.98	.98	.042	

Note: All parameter estimates are statistically significant, $p < .05$.

reliability estimates for males reached acceptable levels (.71–89), and female Cronbach's alpha scores were also found to be acceptable (.75–.90) with the exception of the Community subscale (.68) which was a little lower than .70. Reliability estimates for Multiville residents also showed that the Community subscale fell just below the usual cut-off point of .70 (.68) while the other subscales were satisfactory (.72–89). Finally, the values for the Oceanview residents were all acceptable (.77–.89). Despite the good to excellent reliabilities for most of the scales for both genders, regions, and the total sample, the female and Multiville residents reliability scores on the community subscale (.68) fell just below the traditionally accepted level of .70 (Hills 2008). In light of Garson's (2012) suggestion of an alpha value of above .60 as being acceptable, the overall SCCS measure was taken as acceptable for use in the current investigation. However, future research may benefit from further refining the community subscale and any analyses utilising this scale for gender and regional differences in the present research should be regarded with some caution.

Confirmatory factor analysis

Results from the first-order CFA examining the six-factor model are also presented in Table 1. The hypothesised model demonstrated an excellent fit to the data with a TLI and CFI of .98, and an RMSEA of .042. In addition to examining the overall model fit, it is also important to examine the individual parameter estimates. The factor loadings (see Table 1) for each individual item indicate that all six factors are well defined with acceptable values ranging from .46 to .81. Table 1 also presents the correlations among the six factors of the SCCS. The correlations between factors ranged from –.41 to .60, providing further support for the model consisting of six distinct factors.

SCCS and risk behaviours

To determine the relations between social capital and risk behaviours in adolescents, SEM was performed with the six factors of the SCCS predicting the frequency of risk behaviours: alcohol use and inebriation, cigarette smoking, cannabis use, sexual activity, and involvement in physical conflicts. The proposed model provided a good fit to the data as indicated by a CFI of .97, a TLI of .96, and an RMSEA of .043 ($x^2 = 1894.45$, $df = 630$). An examination of the predictive paths indicated that 18 of the 36 paths were statistically significant (see Table 2). Consistent with the theory, a sense of belonging and all forms of social capital, predicted a decrease in risk-taking behaviours, while a sense of isolation from the community predicted an increase in risk behaviours. Despite 18 of these paths being significant, it appears that in comparison to the other social capital factors, only community SC accounts for a substantial portion of the variance contributing to risk-taking behaviours during adolescence. Community SC was a strong negative predictor of all forms of risk-taking behaviour and accounted for a considerable amount of the factor variance for Alcohol and Cannabis use, as well as lower involvement in physical violence (12.6%, 7.7%, and 7.3%, respectively). The largest amount of variance accounted for by any of the other factors' predictive paths was 2.7%, and may therefore hold little practical use for research or applied purposes.

Table 2. Predictive relations between the SCCS and risk behaviours.

	Family	σ^{2exp}	Peer	σ^{2exp}	Neigh	σ^{2exp}	Comm	σ^{2exp}	Belong	σ^{2exp}	Isolat	σ^{2exp}
Alco	−.13**	2.6	−.11*	1.2	−.13*	1.4	−.42***	12.6	−.14**	.80	.13**	1.8
Smok	−.11**	1.3	−.06	.30	.01	.01	−.28***	4.5	−.06	.10	−.02	.02
Ineb	−.09	1.1	−.12**	.40	−.13**	.40	−.26***	4.2	−.03	.20	.11*	1.2
Cann	−.15***	2.7	−.09	.70	−.07	.70	−.32***	7.7	−.13**	.30	.03	.20
Sex	−.08	1.0	−.08	.40	−.07	.50	−.24***	4.1	−.07	.40	.09	.80
Phy	.07	.40	−.01	.10	−.09	.70	−.33***	7.3	−.11*	.60	.15***	2.0

Notes: σ^{2exp}, percentage of variance explained; Alco, Alcohol use; Smok, Smoking; Ineb, Inebriation; Cann, Cannabis; Sex, Sexual activity; Phy, Physical conflict; Neigh, Neighbour SC; Comm, Community SC; Belong, School belonging; Isolat, School isolation.

*p = .05.
**p = .01.
***p = .001.

SCCS and risk-taking behaviour gender moderating analysis

To determine whether the relations between social capital and risk behaviours varied as a function of gender, an SEM moderating analysis was performed whereby male and female predictive paths were estimated simultaneously and potential differences highlighted through χ^2 difference testing. Results demonstrated that the free model (Model 1) provided a good fit to the data with a CFI and TLI of .96 and an RMSEA of .046 ($\chi^2 = 2718.80$, $df = 1260$). Placing equality constraints on the beta paths (Model 2) produced a significant χ^2 difference of 120.68 ($df = 42$; $p < .0001$), indicating that there were significant gender differences in the predictive relations between social capital and risk-taking behaviour (Bodkin-Andrews, O'Rourke, & Author 2, 2010). **AQ8** Table 3 presents the strength of the beta paths for both the male and female samples which highlighted a number of gender similarities and differences described below.

Family social capital: Higher levels of Family SC predicted less frequent alcohol consumption, cannabis use, and inebriation for males, and lower levels of cigarette smoking among females. *Neighbour and peer social capital:* For females, Neighbour SC had significant associations with less frequent drinking, and smoking, although it positively predicted higher incidences of inebriation. Interestingly, with the exception of smoking, these same relations were evident in the male sample with peer SC rather than neighbour SC. *Community social capital:* For both males and females, higher levels of community SC were significantly associated with less involvement in all types of risk behaviours. *Sense of belonging*: An increased sense of belonging significantly predicted lower levels of alcohol consumption and inebriation, and less involvement in physical conflict for females, but not for males. *Sense of isolation*: A sense of isolation was significantly and positively related to a higher frequency of alcohol consumption. Additionally, isolation was significantly associated with increased inebriation and physical violence in females; however, this relation was not evident in males.

As the χ^2 difference test indicated that the overall predictive model differed significantly between genders, it was necessary to establish which individual beta paths contributed to this finding through post hoc testing of *all significant paths*. As presented in Table 4, this resulted in a total of 16 post hoc comparisons with an adjusted alpha of .003 (0.05/16 = 0.0003) to control for error.

Subsequent post hoc tests revealed that 5 of the 16 individual paths tested were statistically significant (at the .003 level, see Table 3). Specifically, significant gender differences were identified on the paths with Family SC predicting frequency of alcohol consumption, with males being significantly less likely to consume alcohol when they have high levels of family SC. The paths between family and community SC predicting inebriation indicated that compared to females, males are significantly less likely to get drunk when high in these types of social capital. Post hoc tests also highlighted a significant gender difference between family SC and Cannabis use, with males being significantly less likely to smoke cannabis when they have strong family networks. Finally, the path between sense of belonging and physical conflict indicated that males were significantly more likely to engage in physical conflict when compared to females.

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Table 3. Gender beta coefficients and *post hoc* testing for the SCCS predicting risk-taking behaviours.

Beta coefficients for males (M) and females (F)

	Family		Peer		Neighbour		Community		Belonging		Isolation	
	M	F	M	F	M	F	M	F	M	F	M	F
Alco	−.22**	−.01	−.20*	−.01	−.01	−.23**	−.27**	−.61***	−.10	−.26*	.14*	.16*
Smo	−.01	−.14*	.03	−.05	.14	−.19**	−.23**	−.37***	.07	−.11	.01	.04
Ineb	−.19**	−.02	.20**	−.08	−.01	.25**	−.25**	−.59***	−.05	−.25*	.11	.18*
Can	−.26**	−.03	−.18*	−.02	−.01	−.11	−.25**	−.41***	.11	−.18	.01	.09
Sex	.10	−.06	−.13	−.04	−.11	−.02	−.25**	−.25*	−.03	−.11	.11	.07
Phy	.10	−.06	.10	−.06	−.13	−.01	−.34***	−.34**	−.03	−.34***	.11	.26**

Notes: Neigh, Neighbour SC; Comm, Community SC; Belong, School belonging; Physical, Physical conflict; Alco, Alcohol use; Smo, Smoking; Ineb, Inebriation; Can, Cannabis; Sex, Sexual activity; Phy, Physical conflict.

*$p = .05$.

**$p = .01$.

***$p = .001$.

Table 4. *Post hoc* results.

No.	Predictor	Outcome	$x^{2\text{ Diff}}$	α	No.	Predictor	Outcome	$x^{2\text{ Diff}}$	A
1	Family	Alcohol	15.94	.001	9	Family	Inebriation	10.84	.001
2	Peer	Alcohol	8.41	.004	10	Peer	Inebriation	3.39	.066
3	Neigh	Alcohol	2.74	.098	11	Comm	Inebriation	20.13	<.001
4	Comm	Alcohol	1.72	.189	12	Belong	Inebriation	4.81	.028
5	Belong	Alcohol	0.59	.317	13	Family	Cannabis	13.77	<.001
6	Family	Smoking	1.53	.216	14	Peer	Cannabis	3.15	.076
7	Comm	Smoking	5.13	.024	15	Comm	Cannabis	2.81	.094
8	Neigh	Inebriation	6.85	.009	16	Belong	Physical	8.59	.003

Discussion

The purpose of this research was to address the gap in the current literature on how best to successfully measure social capital and to ascertain how social capital, isolation, and a sense of belonging impact on the risk-taking behaviours of adolescents. An important aspect of this research was to test the psychometric strength of the newly developed SCCS which was designed to address many of the criticisms aimed at the quantitative measurement of social capital (see Stone and Hughes 2002; Krasny et al. 2013). In response to research question one regarding the psychometric properties of the SCCS, the current findings indicated that with the exception of community social capital, the reliabilities for the total sample and critical sub-groups were deemed acceptable for the SCCS factors. Additionally, the proposed a priori factor structure of the SCCS was supported by the CFA as the model provided a good fit to the data. These findings are consistent with suggestions put forth by previous researchers that social capital is a multidimensional construct (Stone and Hughes 2002; Van Deth 2003) consisting of: bonding (family & peer SC), bridging (neighbour SC), and linking capital (community SC). The correlations among the SCCS factors suggest that while each type of social capital assessed in the model are related, the size of the correlations between factors also indicated that they were distinct constructs.

Taken together, these findings support social capital theory as put forth by Putnam (2000) as consisting of trust and norms of reciprocity. In contrast to Fukuyama's (1997) belief that trust can be used as a single-item measure of social capital, both trust and reciprocity items within each factor produced an excellent fitting model supporting the validity of utilising both of Putnam's constructs in the measurement of social capital. Hence these results offer empirical support for a multidimensional conceptualisation of the social capital construct comprising discrete factors based upon bonding, bridging, and linking capital at the family, peer, neighbour, and community levels.

In response to research question two which explored the link between social capital and risk-taking behaviour, results indicated, with few exceptions, that all types of social capital and a sense of belonging were associated with decreased levels of risk-taking behaviours, while being socially isolated resulted in an increase in risk-taking behaviour. However, the most important and potent predictor of reduced youth risk-taking behaviours in adolescents was community social capital or what has been described theoretically as linking capital. This finding is important as the limited research exploring the links between social capital and risk-taking behaviours has tended to focus on bonding capital such as family (e.g. Ireland et al., 2000; Stronski et al. 2000) and friend relations (e.g. Browning, Leventhal, and Brooks-Gunn 2004), or on bridging capital at the neighbour level (Boyce et al. 2008) with little attention given to linking capital or relations at the

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institutional level. However, supporting Putnam's (2000) theoretical view about the importance of community, the current findings suggest that educational and intervention programmes aimed at reducing adolescent risk-taking would benefit most from promoting strong social connections between youth and the wider community rather than family and friend networks, particularly in the case of females. Additionally, the negative relation identified in the current study between family social capital and alcohol and cannabis consumption is consistent with previous studies that reported that supportive parent–child relationships with open lines of communication result in lower levels of drug use during adolescence (e.g. Stronski et al. 2000).

In relation to the potential value of peer social capital, the present investigation showed that higher levels of peer social capital were significantly associated with less alcohol use and lower frequency of inebriation. This is interesting as it is often assumed that the peer group emboldens or 'pressures' adolescents to use alcohol, particularly among males (Iwamoto and Smiler 2013). However, demonstrating that peer networks regarding alcohol are not always detrimental, these findings appear to support the suggestion that peer relations as a source of social capital can be used to encourage or discourage risk-taking practices depending on the nature of the peer group norms (Portes 1998; McNeely and Falci 2004). Therefore, highlighting the worth of social capital at multiple levels, educating the peer group about the significant public health problems and costs associated with underage drinking may serve to reinforce the findings above and serve to lower alcohol consumption among teens.

Although not tested directly, prior research has suggested that the influence of peer relations can be influenced by levels of family social capital (Watts and Nagy 2000), which may have been the case in the present investigation. As mentioned above, our results show that both family and peer social capital reduced alcohol and drug use, therefore even if the current sample's peer norms advocated the use of these substances, it can be assumed from the results that existing family values overrode this potential negative influence.

The importance of community social capital and school integration established in the current study was supported by the findings of McNeely and Falci (2004) who demonstrated that a strong attachment to school and positive student–teacher relations resulted in fewer physical altercations, and reduced consumption of drugs and alcohol. The current results also support McNeely and Falci's finding that involving adolescents in institutions and community groups that frown upon risk-taking practices (e.g. churches, sporting teams) can act as an effective deterrent for engaging in risky and dangerous activities (Anteghini et al. 2001; Merrill, Salazar, and Gardner 2001). Interestingly, they also found that if a teen's parent/s is also involved in the community group or institution, this negative association is even stronger, again suggesting that there is a moderating effect occurring between family relationships and other forms of social capital.

The current findings of gender differences in the relation between social capital and risk-taking are important, as there is inadequate empirical evidence in this area research. In the current study, exploration of gender differences revealed that to prevent smoking, alcohol use, physical violence, and inebriation in females, it is most important to ensure that adolescent girls have strong ties with the community or quality stocks of linking capital. This finding is consistent with the results of the Smylie, Medaglia, and Maticka-Tyndale's (2006) study which demonstrated that the most influential factor for reducing risk behaviours among females was participation in community groups.

While community social capital was also effective in deterring boys from the same behaviours, family, and peer social capital were also associated with significant decreases, suggesting that the ability of young males to restrain from engaging in these behaviours is influenced by multiple facets of social capital. The strong positive influence of community social capital on female risk-taking, and the additional impact of peer and family social capital on male risk-taking behaviours, is consistent with one of the few previous studies examining these relations (Smylie, Medaglia, and Maticka-Tyndale 2006).

The gender differences identified in the current research suggest that in order to lessen substance abuse and violence in females, initiatives need to ensure that females engage in a variety of community groups. The need to develop such community-based initiatives is vital as a recent review of risk-behaviour reduction strategies failed to identify a single community only risk-reduction programme (Carney and Myers 2012). The finding that male risk-taking was significantly influenced by both linking and bonding social capital suggests that males would benefit most from a multi-domain risk-reduction strategy targeting family, peer group, and community social connections. These findings are significant because to date the effectiveness of single- and multi-domain interventions has produced mixed evidence. This may reflect the gender differences observed in the current research suggesting that such single-domain interventions within the community would most benefit females while males would gain the most from multi-domain risk-reduction programmes.

Strengths and limitations of the research

A particular strength of this research was the development of the new SCCS which has addressed many of the criticisms aimed at previous attempts to theoretically conceptualise, define, and measure social capital. A well-established issue in the literature is the difficulty in defining social capital consistently (Sabatini 2009) and the failure of most previous research to include all theorised elements of social capital into their definitions (Pope 2003; Van Deth 2003). To address these concerns, this research reconciled the three most commonly cited components in the theoretical and empirical literature defining and successfully measuring social capital as consisting of social relations or networks based on trust, and the values and norms of reciprocity. The study also demonstrated empirically that social capital operates independently at different levels (family, peer, neighbour, and community) within the social structure.

A potential limitation of the research was the relatively low reliabilities found in the community factor of the SCCS for the female and Multiville sub-samples. While deemed acceptable for the current sample, caution should be taken when drawing inferences to the wider population. The community factor also had the lowest reliability of the six factors when using the total sample. These low reliabilities may be due to the diversity of the items within the subscale. That is, items in the community factor ask about trust and reciprocity within the community in general, and the institutions within the community (school, police, etc.). The lack of cohesion in this scale may therefore reflect the varying views the participants have of the different institutions. Finally, the use of cross-sectional data was a limitation. Further research should attempt to use longitudinal data to ascertain temporal relations between constructs to enable inferences regarding the influences of certain variables on others.

Implications for further research

Our findings show that the use of a theory-driven and empirically validated instrument is crucial for meaningful investigations in the area of social capital research. Theory and measurement are intertwined and should mutually reinforce each other. Further research would benefit from further refining existing instruments to promote more systematic investigations. At the same time, the multiple levels of social capital (family, peer, neighbour, and community) need to be considered in designing measures to address theoretical perspectives at these various levels. Further research should also examine the applicability of such measures across different cultural groups and ethnicities over multiple time points of data collection. Whereas the associations of social capital with a range of variables have been reported here and elsewhere, their causal relations have rarely been investigated. Longitudinal studies should be the next step in future, and intervention studies will also be an important future focus to establish the cause-and-effect relations among variables so as to guide policy and practice using a strong evidence base.

Conclusion

Youth risk-taking behaviours detrimentally impact on an adolescent's physical and emotional well-being, and can result in criminal charges, injury, hospitalisation, and even death. The current research is significant in that it has identified potential sources of social capital that can ameliorate risk-taking in youth, and subsequently assist in the reduction of these potentially severe consequences. The current findings are particularly important for informing policy as existing prevention strategies to reduce adolescent risk-taking behaviours are based primarily on demographic and socio-economic factors and tend to neglect the impact of the social environment (Smylie, Medaglia, and Maticka-Tyndale 2006). Our results indicate that the same attention should be given to strengthening adolescents' stores of social capital and creating places where youth feel like they belong (e.g. sports teams, youth centres, and church groups). Past research has consistently demonstrated that adolescents living in poor communities are at the greatest risk of poor physical and mental health outcomes, have the lowest levels of social capital, and are more prone to taking risks with their lives (e.g. Smylie, Medaglia, and Maticka-Tyndale 2006). However, our study indicates that social capital can make a difference in increasing the life chances of underserved youth and contribute to narrowing the physical and mental health gap between advantaged and disadvantaged youth.

  *Note: Informed consent was obtained from all individual participants included in this research and all procedures in the study were conducted in accordance with the ethical standards of the Australian Catholic University Human Research Ethics Committee, the NSW Department of Education and Communities (SERAP), and the Australian National Statement on Ethical Conduct in Human Research, 2007.

Disclosure statement

No potential conflict of interest was reported by the authors.

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