The relationship between adolescent sexual risk taking behaviour and resilience

This research paper was submitted to the School of Psychology, Faculty of Science and Information Technology, The University of Newcastle

for

Master of Health Psychology

September 2013

by

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Statement of Originality

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Acknowledgement of Collaboration

I hereby certify that the work embodied in this thesis has been done in collaboration with the Population Health Unit, Hunter New England Local Health District. I have included as part of the thesis a statement, in the study design section, clearly outlining the extent of collaboration, with whom and under what auspices.

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Sally Homer
Acknowledgements

It is with much appreciation that I acknowledge the following individuals for their assistance during the course of my research.

A/Prof Jenny Bowman and Dr Megan Freund, my very approachable, dedicated and good humoured supervisors, who provided a wealth of knowledge and expertise as well as invaluable feedback, encouragement and support.

Kim Colyvas, who assisted enormously and very patiently with statistical support.

Rebecca Hodder, who allowed me access to her research data and was always generous in providing additional information.

Christophe Lecathelinais who provided me with the data set and was always approachable regarding statistical issues.

Christine Edwards and Laura Jenkins who enthusiastically assisted with resources for adolescent sexual health research.

My family, Warren, Benj and Luke, who provided support and encouragement and a welcome distraction.
Abstract

Research indicates that adolescent sexual risk taking can have both short term and long term negative impacts on adolescent well-being. Healthy adolescent well-being has been linked to resilience. Resilience has been defined as the ability to bounce back and maintain adaptive behaviour following adversity. Both individual and environmental factors are recognised as enhancing the development of resilience. Resilience factors appear to confer a level of protection against a range of health related risk taking behaviours among adolescents including tobacco, alcohol and marijuana use. Relatively little research however has explored relationships between resilience and sexual risk taking behaviour in adolescents. Although a significant body of research has examined a range of resilience factors as possible determinants of sexual risk taking behaviour few have conceptualised and measured both internal and external resilience factors. As such, a study was undertaken to explore the association between sexual risk taking among Australian adolescents and resilience.

Methods

A cross-sectional, web-based survey of Grade 10 (aged 15-17 years, males = 261, females = 260) high school students was undertaken. Twenty eight public secondary schools located in one local health district in New South Wales, Australia participated. Grade 10 students were eligible to take part if parental consent had been obtained. Students completed an online survey in 2011. Students reported if they had engaged in sexual intercourse in the last year, and if so, if they had used a condom. Students also reported their internal and external resilience characteristics. Associations between use of condoms in the past year and resilience characteristics were examined.
Measures

Student demographic information collected included: age, gender, Aboriginal and/or Torres Strait Islander status, student remoteness (using postcode), and socioeconomic status (using postcode).

Sexual risk taking behaviour

Student reported sexual risk taking behaviour (non-use of condoms) was measured by responses to two questions:

1. Have you had sexual intercourse in the last year? (yes, no)
2. If yes, when you had sex in the last year, how often did you or your partner use condoms? (always, sometimes, never).

Resilience

Student reported resilience, including overall, internal and external resilience, was measured using the California Healthy Kids survey. The survey included six subscales for internal resilience; cooperation and communication, self-efficacy, empathy, problem solving, self-awareness and goals and aspirations, and eight subscales for external resilience; school support, school meaningful participation, community support, community meaningful participation, home support, home meaningful participation, peer caring relationships and pro-social peers.

Analyses

Descriptive statistics were used to report student characteristics, as well as the prevalence of condom use and resilience scores. For those students who reported having sex in the last year, associations between internal and external resilience scores and condom use were analysed using chi square, t-tests and logistic regression analyses.

Results

The percentage of students who reported engaging in sexual intercourse in the last 12 months included 50.1% of males and 49.9% of females, while 61% of these students reported consistent condom use. Students with lower external and internal resilience were less likely to use
condoms all of the time (OR = 0.53 and OR = 0.57 respectively). Students with lower scores for the internal resilience subscale, goals and aspirations and the external resilience subscales of community participation and pro-social peers were most strongly associated with a lower likelihood of using condoms all of the time (OR = 0.69, 0.75 and 0.60 respectively).

**Implications**

The associations found between both internal and external resilience and sexual risk taking, and identification of specific resilience factors that may be especially important, suggests that intervention research should examine the impact of resilience intervention on adolescent health risk taking behaviours. The findings may facilitate the development of effective intervention programs and policy to decrease sexual risk taking behaviours and improve adolescent sexual health outcomes.
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A review of the literature: sexual risk taking and resilience in adolescents
Adolescent risk taking behaviours

Healthy adolescent well-being can be detrimentally impacted by a range of health risk taking behaviours (Rew & Horner, 2003). These include smoking, drug use, alcohol use, drinking and driving, unhealthy dietary habits, inadequate physical activity, violent behaviour and sexual risk taking (Blum, McNeely, & Nonnemaker, 2002). Sexual risk taking behaviour includes behaviours such as non-use of condoms, having unprotected sex and having many different sexual partners (Kirby & Lepore, 2007).

Consequences of adolescent sexual risk taking behaviours

Adolescent sexual risk taking can have both short term and long term negative consequences, including sexually transmitted diseases (STDs) and unintended teenage pregnancies (Australian Institute of Health and Welfare (AIHW), 2011). Untreated sexually transmitted diseases such as chlamydia can have health consequences such as pelvic inflammatory disease, infertility, chronic pain and complications in pregnancy (Kong et al., 2011; O’Rourke, 2008). However, the negative consequences of both unintended pregnancies and sexually transmitted diseases extend beyond physical and mental health considerations to broader social and economic consequences for both adolescents and society (Di Clemente et al., 2008; O’Rourke, 2008).

Teenage motherhood is linked to poor social, economic and health outcomes (O’Rourke, 2008). Teenage mothers are less likely to access antenatal care, have poorer birth outcomes and their children are more likely to require hospitalisation as infants and further into childhood (O’Rourke, 2008). Long term consequences for children of teenage mothers include an increased likelihood they will live in poverty, experience neglect or abuse, underperform at school and become a teenage parent themselves (O’Rourke, 2008). Sexually transmitted diseases have community impacts through their effect on quality of life, reproductive health and child health (Department of Health and Ageing (DOHA), 2010).
In the United States (US), the direct medical costs alone of new sexually transmitted diseases are estimated to be $16 billion per annum (Chesson, Blandford, Gift, Tao, & Irwin, 2004; US Department of Health and Human Services, 2013). In the United Kingdom (UK), the economic impact of new diagnoses of sexually transmitted diseases in 2011 was £620 million for medical treatment costs (Lucas, 2013). In Australia, public health expenditure for communicable disease control, which includes activities associated with the prevention of HIV/AIDS, sexually transmitted diseases, needle and syringe programs and other communicable disease control, amounted to $284.9 million in 2008/2009 (AIHW, 2011). Annual direct economic costs associated with chlamydia alone on public health expenditure in Australia are estimated at $90-$160 million (Nisyrios, 2006).

**Prevalence of sexual risk taking behaviour**

In developed Western nations, large-scale population survey data provides some indication of the levels of sexual risk taking behaviour among adolescents and suggest some concerning and sometimes contradictory trends. Different measures used to examine risks however pose some limitations on comparison of findings across surveys and countries. Further, caution has been urged with interpreting findings of condom use in particular in that measures of the percentage of the population using condoms are distinct from measures that calculate the frequency or consistency of condom use (Salazar, Santelli, Crosby, & Di Clemente, 2009).

Large scale surveys measuring sexual attitudes and lifestyles were undertaken in the UK with random samples of the population aged 16 to 59 year olds in 1990-91 (Johnson, Wadsworth, Wellings, & Field, 1994), 1999-2001 (Cassell, Mercer, Imrie, Copas, & Johnson, 2006) and most recently with women 16-49 years and men 16-69 years in 2008-2009 (Office for National Statistics (ONS), 2009). Condom use was defined in each survey as any use in the previous year. For the 16-24 years age group, condom use consistently increased for both males and females across the three survey periods: in 1990, 60.8% of males and 41.8% of females;
To some extent, such increases may reflect increases in both the prevalence of early sexual activity, as well as in number of sexual partners. For instance, increases in the proportions of females (16.4% in 1994, 27% in 2000) and males (25.4% in 1994, 27.9% in 2000) who engaged in sexual intercourse before the age of 16 years and an increase in the reported number of multiple partners (10+) in the last five years for females (2.5% in 1994, 9.2% in 2000) and males (11.2% in 1994, 14.1% in 2000) (Johnson, Mercer et al., 2001; Johnson, Wadsworth et al., 1994; Wellings et al., 2001). Data for the 2008/2009 survey does not measure prevalence of sexual intercourse before 16 years and only measures multiple partners in the previous 12 months.

In the US, the prevalence of adolescent sexual health risk behaviours has been measured every two years with students aged 14-18 years (US Department of Health and Human Services, 2011). The results suggest an upward trend between 2001 and 2011 in the prevalence of those who had ever had sexual intercourse (45.6% to 47.4%) and a downward trend in the use of a condom during the last occasion of sexual intercourse from 2003 to 2011 (63.0% to 60.2%) (US Department of Health and Human Services 2011).

In Europe, data on adolescent sexual behaviour has been collected every four years since 1983. The survey involves students’ aged 15 in 43 countries across Europe and North America. The 2001/2002 survey was the first of these surveys to include standardised questions on sexual health (Currie et al., 2004). Subsequent comparison with 2005/2006 and 2009-10 survey results indicated some gender differences in trends, such that the average rate of condom use at last intercourse showed a relatively stable prevalence for males (80.2% in 2001/2002, 81% in 2005/2006, 79% in 2009/2010) and an increase for females (69.6 in 2001/2002, 72% in 2005/2006, 76% in 2009/2010) (Currie, Gabhain et al., 2008; Currie, Roberts et al., 2004; Currie, Zanotti et al., 2012). Data measuring the prevalence of 15 year olds who have ever had sexual intercourse indicated a similar gender pattern, with an increase for both males and

In Australia, data on sexual health among adolescents has been collected nationally at regular intervals since 1992. The most recent survey was conducted in 2008 and involved Grade 10 and 12 students (15-18 years of age) (AIHW, 2011). Compared with earlier surveys, the findings suggest an increase in Grade 10 and Grade 12 students who had ever had sexual intercourse (34% in 1997, 35% in 2002, 40% in 2008), with the greatest increase indicated for Grade 12 students (47% in 2002, 56% in 2008) (AIHW, 2011). Among sexually active students in Grade 10 and 12, there was a downward trend in the prevalence of reported condom use at the last sexual encounter (68% in 1997, 65% in 2002, 64% in 2008) (Agius, Pitts, Smith, & Mitchell, 2010). Agius et al (2010) suggest that:

Although consistent condom use remains moderately high, it is of some concern that condom use has not increased since 1997 despite related increases in sexual activity among adolescents who have experienced sexual intercourse and increased rates of sexually transmitted diseases among this group. (p. 476)

**Prevalence of teenage pregnancy and sexually transmitted disease**

With respect to rates of teenage pregnancies, decreasing trends are evident in several developed Western nations, including Australia. In the UK, teenage pregnancies have steadily declined in the 15-17 year population group from 1998 (46.6 conceptions per thousand) to 2011 (30.9 conceptions per 1,000) (ONS, 2013). In the US, over the period from 1991 to 2010, the teenage pregnancy rate for girls aged 15-19 years declined by 45% from 61.8 to 34.2 pregnancies per 1,000 teenage girls. Despite this decrease however, it has been noted that the US has the highest teenage birth rate when compared with similar economically developed countries (National Center for Health Statistics, 2011). The teenage birth rate in Australia, whilst lower than that of
the UK and US, compares unfavourably with other Organisation for Economic Co-operation and Development (OECD) countries at 15 births per 1,000 of 15-19 year olds (22nd out of 26 countries) (AIHW, 2011). While the factors contributing to such trends are undoubtedly complex, increased access to and use of the contraceptive pill and other hormonal contraceptive methods have been recognised as contributing to the decline in unintended pregnancies (Jones, Mosher, & Daniels, 2012).

Data indicates generally increasing trends in rates of sexually transmitted diseases. UK data indicate an increase for the 15-24 year population in the number of sexually transmitted disease diagnoses between 2008-2011 for chlamydia (157,376 cases in 2008, 166,847 cases in 2011) gonorrhoea (8,426 cases in 2008, 10,238 in 2011) and syphilis (414 cases in 2008 and 512 in 2011) (Health Protection Agency (HPA), 2011). US data indicate that sexually transmitted diseases for the age group 15-24 years account for 50% of all new STDs (US Department of Health and Human Services, 2013). Some differences in trends have been evident by type of STD. For people aged 15-19 years for instance, over the period 2007-11, both chlamydia and syphilis infection rates increased, although the increases were different in scale: from 1760.8 to 2082.7 notifications per 100,000, and from 3.1 to 3.9 per 100,000 respectively. During the same period, gonorrhoea rates for the same age group decreased from 457.6 per 100,000 to 400 per 100,000 (US Department of Health and Human Services, 2013).

In Australia, rates of sexually transmitted diseases have increased in the 12-24 year population group between 1998 (notification rate 280 per 100,000) and 2008 (1,045 per 100,000) (AIHW, 2011). Chlamydia was the most frequently reported sexually transmitted disease in 2008 (945 notifications per 100,000), with notifications having increased nearly five-fold between 1998 and 2008 (AIHW, 2011). Although it is accepted that in part such an increase reflects an increase in testing, it is also the case that there has been a real increase in chlamydia infections (AIHW, 2011).
Resilience theory

A socio-ecological model provides a broad theoretical context for understanding the multiple interacting factors that influence health behaviours, including the development of health risk behaviours during adolescence (Di Clemente et al., 2008; Sallis, Owen, & Fisher, 2008). Such a framework emphasises the diverse backgrounds, experiences and opportunities that result from the interaction between an individual’s behaviour within their social and environmental setting and incorporates psychosocial determinants at individual, familial, peer, school, cultural and community levels (Di Clemente et al., 2008; Kia-Keating, Dowdy, Morgan, & Noam, 2011).

A framework incorporating both individual and environmental factors as determinants of adolescent health risk behaviour is consistent with resilience theory. Resilience theory emerged from research regarding individuals who had successfully adapted following major adversity or vulnerable circumstance, such as adults survivors of concentration camps (Antonovsky, Maoz, Dowty, & Wijsenbeek, 1971), family separation following the second world war (Hill, 1958), and adult patients with schizophrenia (Garmezy & Rodnick, 1959). For example, initial research with adult patients with schizophrenia found daily living outcomes were markedly different, with some patients leading functional lives while others continued to struggle (Garmezy & Rodnick, 1959). Seeking explanation behind these differences encouraged further studies throughout the 1960s and 1970s that focused on children. These studies examined the characteristics that allowed some children to endure and adapt in difficult situations in comparison to others (Anthony, 1974; Garmezy, 1971, 1974; Murphy, 1974; Murphy & Moriarty, 1976; Rutter, 1979; Werner & Smith, 1982) (Masten, 2001). This body of research concluded that the process was ‘resilience’ (Masten, 2001).

Resilience was defined by Bandura (1979) as the ability to bounce back and maintain adaptive behaviour following adversity (Bandura, 1979). More recently, following a review of over 270
research articles, the definition and characteristics of resilience have been further elaborated by Windle, Bennett, & Noyes (2011) as:

The process of negotiating, managing and adapting to significant sources of stress or trauma. Assets and resources within the individual, their life and environment facilitate this capacity for adaptation and ‘bouncing back’ in the face of adversity. Across the life course, the experience of resilience will vary. (p. 2)

**Individual and environmental resilience factors**

Both individual and environmental factors are recognised as enhancing the development of resilience (Bernat & Resnick, 2006). The individual’s ability to positively adapt to adverse circumstances is influenced by the continuous interaction between individual factors and the social contexts and relationships in which the individual is embedded (Blum et al., 2002; Sun & Stewart, 2007). Resilience factors that confer ‘protection’, in terms of bolstering capacity to cope with adversity and challenging circumstances, can occur at any individual or environmental level or in the interaction between these levels (Riley & Masten, 2005).

Individual resilience factors confer ‘internal resilience’ and include positive self-perceptions, social and emotional competence, problem solving skills, mastery motivation, and spiritual awareness (Blum et al., 2002; Masten & Obradovic, 2006; Rew & Horner, 2003). Positive self-perceptions encompass characteristics such as self-efficacy, self-esteem and internal locus of control that enable an individual to act independently with confidence in their own capacities (Benard, 2004; Masten, 2001). Social competence has been defined as the ability to use a number of interpersonal skills to build relationships and connections, and includes communication, cooperation, empathy and the ability to evoke positive reactions from others, also referred to as an easy temperament (Benard, 2004; Masten, 2001; Wachs, 2005). Emotional competence refers to the ability to regulate one’s emotions and recognise and respond to the emotions of others (Gavin, Catalano, & Markham, 2010). Problem solving skills incorporate
characteristics from the cognitive system such as planning, flexibility, initiative and critical thinking skills (Benard, 2004; Masten, 2001). Mastery motivation involves having a sense of purpose and the ability to develop and achieve goals (Benard, 2004). Spiritual motivation refers to hope and optimism surrounding possible future outcomes (Gavin et al., 2010).

Environmental resilience factors confer ‘external resilience’ and relate to positive impacts from the environment in which the adolescent lives and include connectedness with family, school, peers and the community (Masten & Obradovic, 2006; Mindmatters, 2000; Rew & Horner, 2003). Connectedness refers to a sense of belonging, feeling valued and meaningful engagement within these environments (Benard, 2004; McNeely, Nonnemaker, & Blum, 2002).

Within the family, effective parenting underpinned by a nurturing and emotionally supportive environment has been associated with resilience (McCubbin, McCubbin, & Thompson, 1987b). Factors that represent effective parenting include behavioural monitoring (Galambos, Barker, & Almeida, 2003; Schneider, Cavell, & Hughes, 2003), understanding and connectedness (Blum, Beuhring, Shew, Bearinger, Sieving, & Resnick, 2000), having an interest in children’s’ peers, their peers’ parents, and teachers (Dishion & Kavanagh, 2003), establishing specific and high expectations for behaviour and academic performance (DiClemente, Santelli, & Crosby, 2009), setting clear boundaries and negotiating rules (Steinberg, Elmen, & Mounts, 1989), family cohesion, and autonomy (Lezin, Rolleri, Bean, & Taylor, 2004).

Characteristics that relate to a positive connection to school include a safe and nurturing environment, positive relationships with friends, positive teacher support, opportunities to achieve, having a sense of belonging, engagement in educational progress, belief that discipline is fair and consistent and involvement in extracurricular activities (Klem & Connell, 2004; Rutter, 1987; Werner, 1995). Community characteristics that promote positive connections include adolescent supervision and consistent adult values within the neighbourhood (Gephart, 1997), supportive community relationships (Benard, 2004; McCubbin, Paterson, & Glynn, 2000).
1987a), safe neighbourhoods, access to meaningful work opportunities and extracurricular activities (Alvord & Grados, 2005; Benzies & Mychasiuk, 2009). Positive connections to peer groups are characterised by positive peer caring relationships (Benard, 2004; Luthar, 2006), values and norms (Chen, Thompson, & Morrison-Beedy, 2010; Masten & Obradovic, 2006).

Assessing resilience

The conceptual understanding that resilience overall is a function of both internal and external domains, and the multitude and complexity of those factors which have been seen as relevant to each of the two main domains of resilience, continues to represent a challenge to the design of measurement tools (Windle et al., 2011). A recent review of the psychometric properties of 15 resilience measures used in general and clinical populations found no existing ‘gold standard’ (Windle et al., 2011). Overall, the review found it difficult to establish the quality of the resilience measures due to insufficient details surrounding the development and validation of the measures, inadequate reporting of psychometric information and questionable theoretical design, with the majority of measures assessing resilience solely in the individual domain (Windle et al., 2011). Caution was also recommended when comparing resilience cross culturally as it is suggested that the meaning of resilience is unclear in different cultures (Ungar, Liebenberg, Boothroyd, Kwong, Lee, LeBlanc et al., 2008; Windle et al., 2011).

The review undertaken by Windle et al. (2011) identified only five measures demonstrating conceptual ability to assess resilience across internal and external domains (Donnon & Hammond, 2007; Friborg, Barlaug, Martinussen, Rosenvinge, & Hjemdal, 2007; Hjemdal, Friborg, Stiles, Martinussen, & Rosenvinge, 2006; Sun & Stewart, 2007; Ungar et al., 2008). Of these five measures, one assessed resilience with adults (Friborg et al. 2007) and another with at risk youth (Ungar et al., 2008). Three measures, developed in Norway, Canada and the US, assessed adolescent resilience (Donnon & Hammond, 2007; Hjemdal et al., 2006; Sun & Stewart, 2007). Both the Canadian and US measures incorporate a more comprehensive
measurement of external resilience than the Norwegian measure, as they include the assessment of community connectedness, and although developed recently have been used quite extensively in secondary schools in their respective countries of development (Hall, 2010; Hanson & Kim, 2007).

**Resilience and adolescent risk behaviours**

Resilience factors appear to confer a level of protection against a range of health risk taking behaviours among adolescents (Blum et al., 2002). Research has suggested for instance that internal resilience factors offering protection against substance use include self-efficacy, social competence skills (Benard, 1991; Kaplan, Martin, & Robins, 1984), self-esteem (Byrne & Mazanov, 2001) and internal locus of control (Scheier, Botvin, & Miller, 1999). Academic performance is also linked with health risk behaviour (Ward & Linke, 2011), while goals and aspirations for the future have been considered by some as the most reliable predictors of adolescent risk taking behaviour (Fors, Crepaz, & Hayes, 1999; Kingston, Huizinga, & Elliot, 2009).

External resilience factors such as parental monitoring have been suggested to protect against exposure to drugs, while family connectedness has been associated with decreased use of tobacco, alcohol and marijuana (Blum, & Reinhart, 1997; Resnick et al., 1997). Low levels of community attachment have been associated with increased substance use (Van Horn, Hawkins, Arthur, & Catalano, 2007), while high levels of community attachment have been suggested to increase health promoting behaviours in relation to alcohol and drug use and sexual risk taking (Bernat & Resnick, 2009). Peer disapproval of drugs is protective for drug use (Kaplan, Martin, & Robbins, 1984). A strong connection to school results in decreased health risk behaviours including substance use (Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004) violence and risk taking sexual behaviour (Bernat & Resnick, 2009) with supportive teachers linked to a decrease in the initiation of cigarette smoking, binge drinking, marijuana use, sexual intercourse
and violent behaviour (McNeely & Falci, 2004). Research indicates connectedness to family, school, peers and the community confer protection against a number of health risk behaviours (Bernat & Resnick, 2006). Studies have also shown that a combination of a number of factors within both internal and external resilience domains results in adolescents who are less likely to participate in health risk behaviours such as substance use and alcohol use (Ali, Dwyer, Vanner, & Lopez, 2010; Fors et al., 1999; Veselska, Geckova, Orosova, Gajdosova, van Dijk, & Reijneveld, 2009).

Resilience and adolescent sexual risk behaviour

As for other adolescent risk taking health behaviours, an ecological perspective allows for a comprehensive understanding of sexual risk taking behaviour and accommodates “the need to understand both the personal and the environmental factors which may contribute to the decision to become sexually active and, subsequently, the decision to engage in risk-promoting or risk-reducing sexual behaviours” (Kotchick, Shaffer, Forehand & Miller, 2001, p.497). As such, a resilience approach is likely to be appropriate in understanding adolescent sexual risk behaviours (Robin et al., 2004; Salazar et al., 2010).

Although a significant body of research has examined a range of selected resilience factors as possible determinants of sexual risk taking behaviour, we were able to identify few that incorporated both internal and external resilience factors to some degree. A recent review of US studies examining risk and protective factors affecting teenage sexual behaviour published by Kirby and Lepore in 2007 included nine studies (of over 400) that had considered both internal and external factors (See Appendix 1, studies C,D,F,G,H,J,K,M,N). A further two US studies undertaken since 2007 (A,B) and only three studies undertaken outside of the US have been identified, one in Zimbabwe (E), one in Peru (I) and one in Australia (L), resulting in a total of 14 identified studies. The methodological features of these studies and their findings are summarised in Appendix 1 in alphabetical order. While a number of studies used standardised,
validated measures to assess individual elements of internal and external resilience (A,B,C,D,E,F,G,H,K,L,M,N) none used a comprehensive resilience measure such as the two identified in the review undertaken by Windle et al. 2011.

It is difficult to generalise results of the studies to general adolescent population groups due to the range of populations examined. Although six studies were undertaken with high school students, they were undertaken in a number of different countries including three in the US (C,D,G), one in Zimbabwe (E), one in Peru (I) and one in Australia (L). A further four studies included at risk populations aged between 13-21 years (B,J,K,M), one study involved adolescent males (N), another adolescent African American females (F), while two studies included adolescents aged 18-22 years (H) and 15-17 years (A). Sample sizes varied widely, with a range of 195 to over 12,000. Four studies, specific to high school students, had sample sizes in excess of 1,000, undertaken in Zimbabwe (E), Peru (I), and the US (D,G). Five of the fourteen studies measured sexual risk taking behaviours by way of a combination of condom use and number of partners (C,H,J,K,M), four studies used a single measure of condom use (D,E,L,N) and three used number of partners (A,G,I). An STD measure alone was used in one study (F) and in combination with condom use and number of partners in two studies (B,K).

The nature of internal resilience factors examined across the 14 studies included self-esteem (A,B,F,I,J,K,N), self-efficacy (A,C,D,F), educational goals and future aspirations (A,B,H,J,N), academic performance/intelligence (A,D,G), internal and external locus of control (M,N) and communication skills (L). External resilience factors examined included aspects from the family such as parental monitoring, parental communication, parental interaction parental support for contraception use, parental disapproval of pre-marital sex, family support and family violence (A,B,C,D,E,F,G,H,I,J,K,N). Characteristics investigated in relation to peers included peer support, peer attitudes to sex and condom use and peer sexual activity behaviour (C,H,I,J,K,L,M). Community aspects were explored in relation to community violence, quality
of the neighbourhood and community involvement (A,C,E,J) and school characteristics examined school connectedness (A,H).

In general, findings from these studies indicated little consistency in the nature of either internal or external resilience factors associated with sexual risk taking. Internal resilience factors protective for sexual risk taking behaviour in these studies included self-efficacy in two of the four studies (D,F), self-esteem in one of seven studies (J), academic performance in two of three studies (A,G), internal locus of control in one of two studies (M), communication skills in one study (L) and educational goals and aspirations and positive expectations in three of five studies (B,E,H).

Results showed protective external resilience factors were aspects relating to family connection in five of twelve studies (C,E,F,H,J), peer group connection in five of seven studies (C,H,I,J,L) and community connection in two of four studies (C,E). No association was apparent with school connection in two of two studies (A,H). Two studies identified negative associations between sexual risk taking and factors of external resilience, one with family connection (A) and the other with quality of the community (J).

**The gap in the research literature**

Minimal research has been undertaken exploring possible associations between resilience and sexual risk taking behaviours of young people, especially as compared with other health risk behaviours. Despite the diversity and inconsistencies across studies (for example, sample characteristics and data collection methods), it is evident there is a significant gap in the knowledge regarding the association between resilience factors and sexual risk taking behaviour. The major gaps in knowledge include:

- No studies have used a comprehensive resilience measurement tool to examine the association between resilience and sexual risk taking behaviour. Rather, studies have
chosen to examine particular factors of resilience (e.g. self-esteem, connection to family) to examine sexual risk taking behaviour. A comprehensive measure provides the opportunity to “take into account factors from multiple systems of influence and their combined effects on adolescent sexual risk taking behaviour” (Kotchick, et al., 2001, p.513).

- Where studies have examined similar factors of resilience, conflicting outcomes have been reported with respect to the existence and directions of associations.

- Many studies that have examined some aspects of resilience and sexual risk taking behaviour have done so with limited population subgroups (e.g. males, African-Americans or with older, university-aged adolescents)

- The majority of studies have been conducted in the US with few studies conducted in the Australian context. Research acknowledges that the determinants influencing sexual risk taking behaviour should be examined in the context of the characteristics of the target population (Di Clemente et al., 2008; Fergus & Zimmerman, 2005).

- The only study that has been conducted in Australia, was undertaken more than 18 years ago, and as such may not be relevant to adolescent resilience and current sexual risk taking behaviours.

A study examining the relationship between sexual risk taking in adolescence and resilience in an Australian context, using a comprehensive measure of resilience, would provide the opportunity to gain insight into the influence of resilience on adolescent sexual risk taking behaviours. Such an insight may facilitate the development of effective intervention programs and policy to decrease sexual risk taking behaviours and improve adolescent health outcomes in Australia.
The relationship between adolescent sexual risk taking behavior and resilience

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Journal section: Research projects - adolescent health behaviour

Total word count: Abstract: 250
Body of text: 4,086
Tables: 1,500
References: 1,422
Total: 7,258
Summary
Research indicates adolescent sexual risk taking can have short and long term negative impacts on adolescent well-being. Resilience factors appear to confer a level of protection against health risk taking behaviours among adolescents. Little research has explored relationships between resilience and sexual risk taking behaviour in adolescents. The aim of this study was to explore associations between one aspect of sexual risk taking, condom use, among sexually active Australian adolescents, and resilience.

Methods
Grade 10 (aged 15-17 years) students attending one of 28 public high schools in New South Wales, Australia completed an online survey in 2011. Students reported whether they had engaged in sexual intercourse in the last year and, if so, whether they used a condom. Students also reported their internal and external resilience characteristics. Associations between condom use in the past year and resilience characteristics were examined.

Results
Students with lower overall external and internal resilience were less likely to use condoms all of the time. When examining the subscales within internal and external resilience, lower scores for goals and aspirations, community participation and pro social peers, were most strongly associated with a lower likelihood of using condoms all of the time.

Conclusions
Higher levels of internal and external resilience were found to be associated with lower levels of adolescent sexual risk taking behaviour. Research could examine the effect of a resilience-based intervention on adolescent sexual risk taking behaviour and could focus on elements of resilience, such as goals and aspirations, community participation and pro social peers.

Key Words: resilience, sexual risk taking, adolescents, Australia
Introduction
Adolescent sexual risk taking, such as non-use of condoms, having unprotected sex frequently and having many different sexual partners (Kirby and Lepore, 2007), can have both short term and long term negative impacts on adolescent well-being. Negative impacts arise through the spread of sexually transmitted diseases (STDs) like chlamydia, gonorrhoea, syphilis and genital herpes (Salazar et al., 2009). Such diseases can result in pelvic inflammatory disease, infertility, chronic pain and complications in pregnancy (Kong et al., 2011; O’Rourke, 2008). Further, adolescent sexual risk taking can result in unintended teenage pregnancies (AIHW, 2011). Teenage mothers are less likely to access antenatal care and have poorer birth outcomes while their children are more likely to require hospitalisation as infants, live in poverty, experience neglect or abuse, underperform at school and become a teenage parent themselves (O’Rourke, 2008). The effects of both unintended pregnancies and STDs are also experienced by the community as a whole through their broader social and economic consequences (O’Rourke, 2008). For example, the economic costs of STDs in the United States (US) are estimated to be $15.9 billion annually (Chesson et al., 2004).

Across several developed Western nations, data indicate a trend towards increases in STD rates. Although it is acknowledged that in part such increases reflect increases in testing, it is accepted that there has been a real increase in STD infections (AIHW, 2011). For example, data from the United Kingdom (UK) indicate an increase for the 15-24 year population in the number of sexually transmitted diagnoses between 2008 and 2011 for chlamydia (157,376 to 166,847 cases) (HPA, 2011). In Australia, rates of STDs, including chlamydia, gonorrhoea and syphilis increased in the 12-24 year population group between 1998 and 2008 (notification rate 280 per 100,000 compared to 1,045 per 100,000) (AIHW, 2011). Conversely, there are decreasing trends in teenage pregnancies. In the US, the teenage pregnancy rates for girls aged 15-19 declined by 45% from 1991 to 2010. In Australia, the number of teenage pregnancies decreased by 7.8% from 1998 to 2007 (Laws and Sullivan, 2009). Decreases in teenage pregnancies have been attributed to increased use of the oral contraceptive pill (Jones, et al., 2012).
Indicators of sexual risk taking behaviour such as condom use among adolescents suggests concerning trends in the prevalence of risk. In the US, adolescent sexual health risk behaviours indicate an upward trend between 2001 and 2011 in the prevalence of those who had ever had sexual intercourse (45.6% to 47.4%) and a downward trend in the prevalence of use of a condom from 2003 to 2011 (63.0% to 60.2%) (US Department of Health and Human Services, 2011). In Australia, data indicate increases in the proportions of adolescents in Grades 10 and 12 who had ever had sexual intercourse, over the period 2002 to 2008: (Grade 10, 25.8% to 27.4%; Grade 12, 46.8% to 56.1%) (Smith et al., 2009). Conversely, a downward trend has been evident in the prevalence of Australian adolescents in Grade 10 and 12 who reported condom use at the last sexual encounter (68% in 1997, 65% in 2002, 64% in 2008) (Agius et al., 2010).

Resilience factors have been suggested to confer a level of protection against a range of health risk taking behaviours among adolescents including tobacco, alcohol and other substance use (Blum et al., 2002). Resilience has been defined as the ability to bounce back and maintain adaptive behaviour following adversity (Bandura, 1979). It is the process of negotiating, managing and adapting to significant sources of stress or trauma (Windle et al., 2011). Both individual (internal) and environmental (external) resilience factors are recognised as enhancing the development of overall resilience (Bernat and Resnick, 2006). As such a resilience framework is consistent with socio-ecological theory (Di Clemente et al., 2008).

Internal resilience factors found to offer protection against substance use include self-efficacy, social competence skills (Benard, 1991; Kaplan et al., 1984), self-esteem (Byrne and Mazanov, 2001), internal locus of control (Scheier et al., 1999), and academic performance (Ward and Linke, 2011). External resilience factors such as parent and school connectedness have been associated with decreased use of tobacco, alcohol and marijuana (Blum and Rinehart, 1997; Catalano et al., 2004; McNeely and Falci, 2004; Resnick et al., 1997). Studies have suggested that adolescents with higher overall resilience, inclusive of both internal and external resilience, are less likely to participate in health risk behaviours such as substance use (Ali et al., 2010).
Relatively little research has explored relationships between resilience and sexual risk taking behaviour in adolescents. Although a significant body of research has examined a range of factors as possible determinants of sexual risk taking behaviour, few have conceptualised and measured both internal and external resilience factors. Of 400 US studies included in a review of research examining psychosocial factors affecting teenage sexual behaviour (Kirby and Lepore, 2007), only nine studies examined at least one element of internal resilience and at least one element of external resilience (Baumer and South, 2001; Davis and Friel, 2001; Hein et al., 1995; Miller et al., 2000; Pleck et al., 1991; Shafii et al., 2004; St Lawrence, 1993; Voisin, 2005; Williams et al., 2002). An additional five studies since the Kirby et al. review, published in the US and elsewhere have examined the relationship between adolescent sexual risk taking and elements of both internal and external resilience (Betts et al., 2003; Chen et al., 2010; Donald et al., 1994; Magnani et al., 2001; Tevendale et al., 2009). A range of sexual risk taking variables have been assessed, both singularly and in combination, including number of partners, condom use and a confirmed STD.

Internal resilience factors examined in the above studies included academic performance, goals and aspirations, self-esteem and self-efficacy, locus of control and social skills, with ten of the 14 studies finding some significant association between these factors and sexual risk taking behaviour (Baumer and South, 2001; Betts et al., 2003; Chen et al., 2010; Davis and Friel, 2001; Donald et al., 1994; Miller et al., 2000; Shafii et al., 2004; St Lawrence, 1993; Tevendale et al., 2009; Williams et al., 2002). External resilience factors examined included, community, family, and school connection, and peer relationships, with eight of the fourteen studies finding significant association with sexual risk taking behaviour (Baumer and South, 2001; Betts et al., 2003; Chen et al., 2010; Donald et al., 1994; Magnani et al., 2001; Miller et al., 2000; Voisin, 2005; Williams et al., 2002).

However, there were conflicting outcomes across studies examining similar resilience elements. For example, of the 11 studies that examined family connectedness, four studies found that
family connectedness was protective against sexual risk taking behaviour (Baumer and South, 2001; Betts et al., 2003; Miller et al., 2000; Williams et al., 2002), one study found it was associated with increased risk behaviour (Chen et al., 2010), and six studies found no association (Davis and Friel, 2001; Hein et al., 1995; Magnani et al., 2001; Pleck et al., 1991; Shafii et al., 2004; Tevendale et al., 2009). One of few areas of consistency across studies was evident for those examining peer relationships among high school students, where each of three studies found positive peer relationships to be protective for sexual risk taking behaviour (Donald, et al., 1994; Magnani et al., 2001; Voisin, 2005).

The minimal body of research to date has also been limited with respect to methodological quality. None of the 14 studies identified used a comprehensive resilience measure, despite such measures having been developed (Windle et al., 2011). Further, the great majority of studies were undertaken in the US and many included small and or select population sub-groups (eg. at risk groups, or groups of only one gender) which may not generalise to a broader adolescent population. Given these limitations, there is a need to better understand the relationships between sexual risk taking and resilience in order to inform preventive interventions for adolescent sexual risk taking. As such, a study was undertaken to examine the association between sexual risk taking as assessed by frequency of condom use and levels of resilience among Australian adolescents.

Method
Study design
A cross-sectional, web-based survey of Grade 10 high school students was undertaken. The outcomes of interest were self-reported condom use in the last year and internal and external resilience scores. The association between condom use and resilience was examined. The survey was part of the baseline evaluation of a larger intervention project (Hodder et al., 2011). Ethical approval to conduct the study was provided by the Hunter New England Local Health District Research Ethics Committee, the University of Newcastle Human Research Ethics Committees,
the Aboriginal Health and Medical Research Council and the New South Wales Department of Education and Communities State Education Research Approval Process.

**Participants and recruitment**

**Schools**

Public secondary schools located in one local health district in New South Wales, Australia were eligible to participate if they had more than 400 student enrolments, had students in Grades 7 to 10 (generally 12-16 year olds); were co-educational; were not a totally selective school (e.g. enrolment on academic merit); and were not a central school (i.e. had enrolments from kindergarten to Grade 12). The principals (or nominee) of the 36 eligible schools were invited to attend a briefing session regarding the larger intervention project.

**Students**

All students in Grade 10 (generally 15-16 year olds) attending the participating schools were eligible to take part if parental consent had been obtained. Parental consent was gained by mailing study information packs and consent forms to parents. The packs provided a free telephone message service by which parents could decline their child’s participation. Parents who had not responded within two weeks were telephoned by school-affiliated staff to seek consent. Parents who provided verbal consent were re-sent consent forms.

**Data collection procedures**

Baseline data was collected from consenting Grade 10 students via an online student survey conducted during school time. Approximately 25 minutes time commitment was required for the participants to complete the survey.

**Measures**

**Student characteristics**

Student information collected included: age (15, 16, 17 years), gender, Aboriginal and/or Torres Strait Islander status (Aboriginal/Torres Strait Islander/both Aboriginal and Torres Strait Islander/not Aboriginal or Torres Strait Islander), and postcode.
Sexual risk taking behaviour

The primary outcome was to determine student use of condoms in the past year. This was measured in two steps using questions extracted from the National Survey of Australian Secondary Students HIV AIDS and Sexual Health (Smith et al., 2009):

1. Have you had sexual intercourse in the last year? (yes, no)
2. If yes, when you had sex in the last year, how often did you or your partner use condoms? (always, sometimes, never).

Resilience

Assessment of participants’ internal and external resilience was undertaken using questions from the California Healthy Kids Survey (Constantine et al., 1999). The California Healthy Kids survey has been recognised as one of only three resilience measures specifically developed for use with adolescents (Windle et al., 2011). The survey has adequate levels of reliability with all scales indicating reliabilities of 0.70 or greater (Hanson and Kim, 2007).

The survey includes six internal resilience factor subscales and eight external resilience factor subscales, with responses to all items provided on a four point Likert scale ranging from ‘1 - never true’, to ‘4 - true all of the time’, with higher scores indicating increased levels of resilience. The internal resilience subscales include cooperation and communication (2 items); self-efficacy (4 items); empathy (3 items); problem solving (3 items); self-awareness (3 items); goals and aspirations (3 items). The external resilience subscales include: school support (6 items); school meaningful participation (3 items); community support (6 items); community meaningful participation (3 items); home support (6 items); home meaningful participation (3 items); peer caring relationships (3 items); pro-social peers (3 items).

Statistical analysis

Sample characteristics

Descriptive statistics (proportions) were used to report student characteristics including age (15, 16, 17 years), gender, Aboriginal and/or Torres Strait Islander origin (yes, no), student
remoteness (major city, inner regional, outer regional/remote), and socioeconomic status (1 = least disadvantage to 5 = most disadvantaged). Student postcode was used to determine student remoteness and socioeconomic status, using the ARIA Accessibility/Remoteness Index of Australia (DOHA, 2001) and the SEIFA Index of Relative Socioeconomic Advantage/Disadvantage (Trewin, 2003), respectively.

Exploring resilience and condom use variables

Descriptive statistics (proportions) were used to describe the prevalence of condom use (always, sometimes, never) and also resilience scores, with mean scores and standard deviations calculated for overall internal and external resilience, and for the 14 subscales. Subscale scores were derived by calculating the means of all items pertaining to each sub-scale, and the scores for overall internal resilience and overall external resilience were derived by then calculating the means across the relevant subscale scores. Differences in gender and Aboriginality between participants and non-participants were examined using chi square.

Univariate associations between resilience scores (internal and external) and socio-demographic variables were explored using t-tests and analysis of variance (ANOVA). The relationships between internal and external resilience means were explored using correlation coefficients. Univariate associations between condom use (always or never/sometimes) and student characteristics were examined using chi square analysis.

Associations between internal and external resilience and condom use

A logistic regression model was developed to explore the association between condom use (always or never/sometimes) and internal and external resilience. Demographic variables associated with condom use with a $p$ value of 0.05 or less from the univariate analyses were included in the regression model. A backwards elimination approach was utilised whereby the variable with the highest $p$ value was excluded until all predictors in the model had a $p$ value less than 0.05. All two way interactions between the remaining variables in the model were
tested. Finally, all non-significant variables were tested again in the final model one at a time to see if they were significant.

**Associations between resilience subscales and condom use**

A second multiple variable logistic regression analysis explored the association between the internal and external resilience subscales (14 in all, eight external and six internal), and condom use. Models controlled for significant socio-demographic variables and were fit using both forward stepwise and backward stepwise elimination methods. Data were analysed with SPSS version 20.

**Results**

*Sample characteristics*

A total of 28 high schools participated (78%) and 4239 Grade 10 students were enrolled in these schools. Of the enrolled students, 2911 received parental consent to complete the survey. Of the consenting students, 1667 students participated in the survey. There was no significant difference between the participants and non-participants by gender, with the proportions of males being 52.7% and 53% respectively. There was a significant difference between the participants (6.9%) and non-participants (12.4%) who identified as Aboriginal and Torres Strait Islander ($p < .0001$).

A total of 562 students reported they had ever engaged in sexual intercourse and 521 students reported having had sex in the last 12 months. Characteristics of students who reported having had sex in the last 12 months are described in Table 1.
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>261</td>
<td>50.1</td>
</tr>
<tr>
<td><strong>Aboriginal and/or Torres Strait Islander</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>467</td>
<td>89.6</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>231</td>
<td>44.3</td>
</tr>
<tr>
<td>16</td>
<td>282</td>
<td>54.1</td>
</tr>
<tr>
<td>17</td>
<td>8</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Level of disadvantage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Least disadvantaged</td>
<td>33</td>
<td>6.3</td>
</tr>
<tr>
<td>2</td>
<td>187</td>
<td>35.9</td>
</tr>
<tr>
<td>3</td>
<td>238</td>
<td>45.7</td>
</tr>
<tr>
<td>4</td>
<td>59</td>
<td>11.3</td>
</tr>
<tr>
<td>5 Most disadvantaged</td>
<td>4</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>School remoteness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major city</td>
<td>235</td>
<td>45.1</td>
</tr>
<tr>
<td>Inner regional</td>
<td>102</td>
<td>19.6</td>
</tr>
<tr>
<td>Outer regional/remote</td>
<td>184</td>
<td>35.3</td>
</tr>
<tr>
<td><strong>Condom use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>318</td>
<td>61.0</td>
</tr>
<tr>
<td>Sometimes</td>
<td>58</td>
<td>11.1</td>
</tr>
<tr>
<td>Never</td>
<td>145</td>
<td>27.8</td>
</tr>
<tr>
<td><strong>Internal resilience M (SD)</strong></td>
<td>2.93 (0.48)</td>
<td></td>
</tr>
<tr>
<td>Communication/cooperation</td>
<td>2.96 (0.71)</td>
<td></td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>2.99 (0.59)</td>
<td></td>
</tr>
<tr>
<td>Empathy</td>
<td>2.97 (0.74)</td>
<td></td>
</tr>
<tr>
<td>Problem solving</td>
<td>2.70 (0.74)</td>
<td></td>
</tr>
<tr>
<td>Self-awareness</td>
<td>2.97 (0.76)</td>
<td></td>
</tr>
<tr>
<td>Goals &amp; aspirations</td>
<td>3.03 (0.74)</td>
<td></td>
</tr>
<tr>
<td><strong>External resilience M (SD)</strong></td>
<td>2.88 (0.52)</td>
<td></td>
</tr>
<tr>
<td>School support</td>
<td>2.75 (0.83)</td>
<td></td>
</tr>
<tr>
<td>School participation</td>
<td>2.19 (0.75)</td>
<td></td>
</tr>
<tr>
<td>Community support</td>
<td>3.16 (0.82)</td>
<td></td>
</tr>
<tr>
<td>Community participation</td>
<td>2.85 (0.92)</td>
<td></td>
</tr>
<tr>
<td>Home support</td>
<td>3.18 (0.69)</td>
<td></td>
</tr>
<tr>
<td>Home participation</td>
<td>2.76 (0.73)</td>
<td></td>
</tr>
<tr>
<td>Peer caring relationships</td>
<td>3.46 (0.79)</td>
<td></td>
</tr>
<tr>
<td>Pro-social peers</td>
<td>2.73 (0.64)</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Missing item for Aboriginal and/or Torres Strait Islander demographic.

\(^a\) \(n = 1\).
Exploring resilience and condom use variables

Sixty-one percent of students who had sex in the last 12 months always used a condom, 11.1% sometimes used a condom and 27.8% never used a condom (see Table 1). Males and students from outer regional/remote schools were more likely to always use condoms ($p < 0.01$ and $p = 0.04$ respectively).

Mean scores and standard deviations for the overall internal and external resilience scales, and for each of their component subscales, are shown in Table 1. Internal resilience was significantly lower for 17 year olds ($p < 0.01$) and for students from outer regional/remote schools ($p < 0.05$). There was a high correlation between internal and external resilience scores ($r = 0.70$).

Associations between internal and external resilience and condom use

Students with lower external and internal resilience were less likely to use condoms all of the time (OR = 0.53 and OR = 0.57 respectively) (see Table 2). There were no significant interactions amongst variables.

Table 2: Odds ratios from a logistic regression model for the association between frequency of condom use (Sometimes/Never) and internal and external resilience and demographic factors

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>OR</th>
<th>Sometimes/Never</th>
<th></th>
<th></th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Confidence Intervals</td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Internal resilience</td>
<td>0.57</td>
<td>0.33</td>
<td>0.99</td>
<td>0.050</td>
<td></td>
</tr>
<tr>
<td>External resilience</td>
<td>0.53</td>
<td>0.32</td>
<td>0.88</td>
<td>0.010</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.81</td>
<td>1.23</td>
<td>2.64</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School remoteness</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Major city</td>
<td>1.92</td>
<td>1.25</td>
<td>2.94</td>
<td>0.010</td>
<td></td>
</tr>
<tr>
<td>Regional</td>
<td>1.54</td>
<td>0.90</td>
<td>2.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Note. Always is reference group for ORs.
OR = Odds ratios.
Associations between resilience subscales and condom use

Students with lower scores for the internal resilience subscale goals and aspirations (OR = 0.69), and the external resilience subscales of community participation (OR = 0.75) and pro-social peers (OR = 0.60) were less likely to use condoms all of the time (see Table 3). There were no significant interactions amongst variables.

Table 3: Odds ratios from a logistic regression model for the association between frequency of condom use (Sometimes/Never) and resilience subscales and demographic factors

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sometimes/Never</th>
<th></th>
<th></th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>Confidence Intervals</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Internal subscales</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goals and aspirations</td>
<td>0.69</td>
<td>0.53</td>
<td>0.91</td>
<td>0.008</td>
</tr>
<tr>
<td>External subscales</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community participation</td>
<td>0.75</td>
<td>0.60</td>
<td>0.93</td>
<td>0.010</td>
</tr>
<tr>
<td>Pro-social peers</td>
<td>0.60</td>
<td>0.44</td>
<td>0.83</td>
<td>0.002</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2.02</td>
<td>1.34</td>
<td>3.04</td>
<td>0.001</td>
</tr>
<tr>
<td>Male</td>
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<tr>
<td>School remoteness</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major city</td>
<td>1.77</td>
<td>1.15</td>
<td>2.72</td>
<td>0.030</td>
</tr>
<tr>
<td>Regional</td>
<td>1.45</td>
<td>0.85</td>
<td>2.46</td>
<td></td>
</tr>
<tr>
<td>Remote</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Always is reference group for ORs. OR = Odds ratios.

Discussion
This study contributes to the understanding of adolescent sexual risk taking behaviour by exploring the potential relationships between this behaviour and resilience. It found that adolescents who engaged in sexual risk taking behaviours had lower internal and external resilience scores than those not engaged in sexual risk taking behaviour. A number of sub-scales within both the internal and external scales were identified as most strongly associated with condom use.
A number of studies that have previously investigated both internal and external domains of resilience and sexual risk taking have found associations between some factors of each domain (Baumer and South, 2001; Betts et al., 2003; Donald et al., 1994; Miller et al., 2000). However, to the author’s knowledge, this is the first study to examine the association between sexual risk taking behaviour and internal and external resilience using a comprehensive tool to assess resilience. The finding that both internal and external resilience were important in determining sexual risk taking behaviour is however consistent with research that has examined associations between resilience and other health risk behaviours utilising comprehensive resilience measures. For example, a study using a comprehensive resilience scale, albeit one developed for adults, (Resilience Scale for Adults) found that factors from both the internal and external resilience domains were associated with decreased smoking and cannabis use in adolescents (Veleska, et al., 2009).

In the present study, within the internal resilience domain, young people with higher levels of goals and aspirations were less likely to undertake sexual risk taking behaviour. Goals and aspirations are defined as providing ‘a sense of purpose which encompasses hope, educational aspirations and goal directedness’ (Benard, 1991; Hanson & Kim, 2007). Such a finding is consistent with a number of previous studies that have examined this element of internal resilience and risky sexual practice in adolescents (Baumer and South, 2001; Betts et al., 2003; Tevendale, et al., 2009). Most recently for instance, Tevendale et al. (2009), undertook a study of 302 young people in the U.S. and found that having positive expectations of the future was associated with a decrease in sexual risk taking behaviour as measured by the number of sexual partners. The findings of previous research however have been somewhat inconsistent, with a number of studies examining this factor of internal resilience finding no association with sexual risk taking (Miller et al., 2000; Pleck et al., 1991).

Within the external resilience domain, the present study found young people with higher levels of pro-social peers and community participation were less likely to undertake sexual risk taking
behaviour. Pro-social peer relationships are characterised by meaningful and caring behaviour and involve high expectations (Benard, 1991; Hanson and Kim, 2007). Pro-social peer relationships have been linked to a number of different adolescent sexual risk taking behaviours in previous research (Baumer and South, 2001; Donald et al., 1994; Magnani, et al., 2001; Miller et al., 2000; Voisin, 2005). Research has consistently indicated that when adolescents have peers who are sexually active they are more inclined to engage in risky sexual behaviour and that conversely, adolescents with peers who engage in less risky sexual behaviour are more likely to display such behaviours themselves (Baumer and South, 2001; Donald et al., 1994; Magnani et al., 2001; Miller et al., 2000; Voisin, 2005). For example, Miller et al., (2000) in a study of 372 adolescents in the US and Puerto Rico found that individuals in relationships with peers exhibiting low levels of sexual risk taking behaviours were more likely to have decreased sexual risk taking behaviours, including fewer sexual partners.

Connectedness to community is defined as the presence of ‘meaningful and supportive relationships that encourage adolescents to participate in their community’ (Benard, 1991; Hanson and Kim, 2007). The findings of previous studies with respect to the relationship of this factor to sexual risk taking have been inconsistent. Betts et al., (2003) for instance found a lower likelihood of sexual risk behaviours for adolescents who participated in community activities, where the risk taking assessed included the frequency of condom use. Chen and colleagues (2010) found no such association between community connection and sexual risk taking behaviour (Chen et al., 2010), specifically relating to the number of sexual partners.

The prevalence of sexually active students who reported ‘always’ using condoms in the previous 12 months in the current study (61%) was similar to that reported in the most recent Australian survey (56.5%) (Smith et al., 2009). Similarly, the finding of this study that males were more likely than females to report ‘always’ using a condom is consistent with national survey data (AIHW, 2011). Similar national statistics are not available to provide a point of reference with the current study’s finding that students attending schools located in a major city
were more likely to engage in risky sexual behaviour compared with those in inner regional and outer regional/remote areas. Inconsistent findings for other adolescent health risk behaviours are indicated by national statistics where, for instance, young people (12-24 years) living in remote and very remote areas combined were nearly twice as likely to have used an illegal substance in the past year when compared with young people from inner regional areas, yet no such difference by remoteness was evident for other health risk behaviours including smoking and alcohol use (AIHW, 2011).

When interpreting these findings, consideration should be given to some study limitations and strengths. Firstly, in the current study sexual risk taking behaviour was defined as consistency of condom use, and other sexual risk taking behaviours including having three or more sexual partners, and involvement with a sexual partner who has ever had an STD, were not assessed (Wildsmith et al., 2010). A number of factors which may mitigate risk are hence not accounted for, such as the possibility that sexually active couples may have been screened for STDs and use birth control methods. However, the measure used is in line with that of Kirby and Lepore (2007) and has been utilised by previous researchers as the single measure of sexual risk taking in studies examining associations with resilience (Betts et al., 2003, Donald et al., 1994; Pleck et al., 1991; Shafii et al., 2004). Further, in the Australian context, the rate of testing for STDs among 16-19 year olds is quite low, at 8.7% (Kong et al., 2011) and so the importance of including a sexual risk taking behavior describing partners who have ever had an STD was minimised. A second limitation was that students may have been more likely to report always using a condom because it may be perceived as a socially desirable behavior and as such the prevalence of condom use reported may have been an overestimate. However, the use of a computer-based survey offered a degree of privacy and may have minimised social desirability bias (Sieving and Shrier, 2009).
A strength of this study was the use of a comprehensive measure of resilience, the first time such a measure has been used in an Australian secondary school context. The California Healthy Kids tool has been recognised as one of only five measures that demonstrate conceptual ability to assess resilience across many levels (Windle et al., 2011), and as displaying reliability and validity indicating suitability for use in an Australian school population (Sun and Stewart 2007). The use of a comprehensive measure of resilience provided the opportunity to undertake multiple variable analysis to assess the relative ‘strengths’ of association between the internal and external resilience scales with adolescent sexual risk behaviour. It might be reasonable to assume that different patterns of association would likely have been evident from previous studies not utilising a comprehensive measure than have emerged in the current study, and some caution is appropriate in drawing direct comparisons between the findings of previous research and the present study in light of the different nature of measurement tools used. An interesting finding of the present study was a high positive correlation between internal and external resilience, suggesting the need for further research continuing to explore the psychometric properties of comprehensive multi-faceted instruments such as the California Healthy Kids tool.

In conclusion, this study found that both individual and environmental resilience factors are associated with sexual risk taking behaviour. Research is required to examine the effect of resilience-based interventions on adolescent sexual risk taking behaviour. Such research could focus on particular elements of resilience including goals and aspirations, community participation and pro social peers. Results support recent findings from intervention research where a reduction in sexual risk behaviour can be achieved through the development and implementation of positive youth development interventions that increase adolescent resilience (Robin et al., 2004).
References


References: Literature review and journal manuscript


Appendix 1. Review of associations between resilience and sexual risk taking behaviour

<table>
<thead>
<tr>
<th>Study (alphabetical)</th>
<th>Subjects (n size)</th>
<th>Resilience variables examined</th>
<th>Sexual risk behaviours examined</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chen, Thompson, Morrison-Beedy</td>
<td>15-17 year olds (n=4,466)</td>
<td><strong>Internal</strong></td>
<td><strong>Number of partners</strong></td>
<td>Higher GPA positively associated with decreased number of partners</td>
</tr>
<tr>
<td></td>
<td>Data from National Longitudinal Study of Adolescent Health survey (Add Health)</td>
<td>Academic Performance (GPA) Survey - standardised (Y), 4 items</td>
<td>Survey (Y), 2 items</td>
<td>Less parental disapproval of premarital sex positively associated with more partners</td>
</tr>
<tr>
<td></td>
<td>In-home interview Audio-computer-assisted self-interview In school questionnaire Parent questionnaire Pen and paper</td>
<td>Self-efficacy condom use Survey - standardised (Y), 3 items</td>
<td>Less than 5 sexual partners or more than 5 sexual partners</td>
<td>Increased parental monitoring positively associated with more partners</td>
</tr>
<tr>
<td></td>
<td><strong>External</strong></td>
<td>Self-esteem Survey - standardised (Y), 7 items</td>
<td></td>
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<tr>
<td></td>
<td>Parent monitoring Survey - standardised (Y), 2 items</td>
<td><strong>Sexually transmitted disease</strong></td>
<td></td>
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<tr>
<td></td>
<td>Parent disapproval of premarital sex Survey - standardised (Y), 6 items</td>
<td>Measurement tool (validated: Yes (Y)/unclear, number of items)</td>
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<td></td>
<td>School connectedness Survey - standardised (Y), 5 items</td>
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<td></td>
<td>Community environment Survey - standardised (Y), 3 items</td>
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<tr>
<td>Study (alphabetical)</td>
<td>Subjects (n size)</td>
<td>Resilience variables examined</td>
<td>Sexual risk behaviours examined</td>
<td>Findings</td>
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</tbody>
</table>
| B Tevendale, Lightfoot, Slocum 2009 USA | 14-21 year old homeless youth, California (n=302) Interview Audio computer-assisted self-interviewing | **Internal**  
Self- esteem  
Self- Perception Profile for adolescents - standardised (Y), 5 items  
Expectations for future  
Expectations for success scale + 5 additional items - standardised (Y), 10 items  
**External**  
Social support from mother  
Social Support Microsystem Scale (SOC) - standardised (Y), 2 items  
Adult mentor support  
Survey (unclear), 1 item | **Condom use**  
Survey (unclear), 1 item  
Frequency of condom use  
**Number of partners**  
Survey (unclear), 1 item  
Number of sexual partners in previous 3 months  
**Sexually transmitted disease**  
Confirmed STD in last 3 months or lifetime (Y), 1 item | Higher self-esteem for females was positively associated to a higher percentage of condom use  
More positive expectations for the future positively associated with decreased number of partners |
<table>
<thead>
<tr>
<th>Study (alphabetical)</th>
<th>Subjects (n size)</th>
<th>Resilience variables examined</th>
<th>Sexual risk behaviours examined</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voisin 2005 USA</td>
<td>14-19 year old students from a high school in New York (n=409)</td>
<td><strong>Internal</strong></td>
<td><strong>Condom use</strong></td>
<td>Exposure to community and family violence positively associated with decreased condom use</td>
</tr>
<tr>
<td></td>
<td>Questionaire incorporating a number of validated instruments</td>
<td>Self- efficacy</td>
<td>Sexual Behaviour Questionaire (SBQ)(Y), 1 item</td>
<td>Peer support for risky behaviour positively associated with decreased condom use</td>
</tr>
<tr>
<td></td>
<td>Pen and paper</td>
<td>Self- efficacy Scale - standardised (Y), 17 items</td>
<td>Number of times had sex without condom</td>
<td>Exposure to community and family violence positively associated with increased number of partners</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>External</strong></td>
<td><strong>Number of partners</strong></td>
<td>Peer support for risky behaviour positively associated with increased number of partners</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peer support</td>
<td>Sexual Behaviour Questionaire (SBQ)(Y), 1 item</td>
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<td></td>
<td></td>
<td>Peer Network Profile - standardised (Y), 9 items</td>
<td>Number of times had sex with multiple partners</td>
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<td>Peers attitudes to sex</td>
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<td></td>
<td></td>
<td>Sexual Behaviour Questionaire (SBQ) - standardised (Y), 20 items</td>
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<td>Family environment</td>
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<td></td>
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<td>Exposure to Violence Probe (EVP) - standardised (Y), 3 items</td>
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<td>Community environment</td>
<td></td>
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<td></td>
<td></td>
<td>Exposure to Violence Probe (EVP) - standardised (Y), 15 items</td>
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<tr>
<td></td>
<td></td>
<td><strong>Sexually transmitted disease</strong></td>
<td>Measurement tool (validated: Yes (Y)/unclear, number of items)</td>
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<td><strong>Findings</strong></td>
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<td>Study (alphabetical)</td>
<td>Subjects (n size)</td>
<td>Resilience variables examined</td>
<td>Sexual risk behaviours examined</td>
<td>Findings</td>
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<tr>
<td>D</td>
<td>12-18 year old high school students (n=4024)</td>
<td><strong>Internal</strong>&lt;br&gt;Intelligence (IQ)&lt;br&gt;Add Health Picture Vocabulary Test standardised (Y), no. items unclear&lt;br&gt;Self- efficacy for condom use/partner negotiation&lt;br&gt;Add Heath in-home questionnaire - standardised (Y), no. items unclear</td>
<td><strong>Condom use</strong>&lt;br&gt;Survey (Y), 2 items&lt;br&gt;Use of condoms at sexual debut and condom use during most recent sex</td>
<td>High self- efficacy for condom use/negotiation with partner positively associated with condom use</td>
</tr>
<tr>
<td>Shafii, Stovel, Davis, Holmes</td>
<td>Data from National Longitudinal Study of Adolescent Health survey (Add Health)&lt;br&gt;In-school questionnaire&lt;br&gt;In-home interview&lt;br&gt;Audio-computer-assisted self-interview&lt;br&gt;Parent questionnaire&lt;br&gt;Pen and paper</td>
<td><strong>External</strong>&lt;br&gt;Maternal support for contraception use&lt;br&gt;Add Health Parent Questionnaire - standardised (Y), no. items unclear</td>
<td><strong>Number of partners</strong>&lt;br&gt;Sexually transmitted disease</td>
<td></td>
</tr>
<tr>
<td>2004 USA</td>
<td>In-school questionnaire&lt;br&gt;In-home interview&lt;br&gt;Audio-computer-assisted self-interview&lt;br&gt;Parent questionnaire&lt;br&gt;Pen and paper</td>
<td><strong>Measurement tool (validated: Yes (Y)/unclear, number of items)</strong></td>
<td><strong>Measurement tool (validated: Yes (Y)/unclear, number of items)</strong></td>
<td></td>
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<tr>
<td>Study (alphabetical)</td>
<td>Subjects (n size)</td>
<td>Resilience variables examined</td>
<td>Sexual risk behaviours examined</td>
<td>Findings</td>
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<tr>
<td>E Betts, Peterson, Huebner 2003 Zimbabwe</td>
<td>12-19 year old high school students (n=4018)</td>
<td><strong>Internal</strong> Educational aspirations Survey - standardised (Y), 2 items <strong>External</strong> Family support Survey - standardised (Y), 2 items Support from adult role model (not parent) Survey - standardised (Y), 1 item Community involvement in extracurricular activities Survey - standardised (Y), 1 item</td>
<td><strong>Condom use</strong> Survey (Y), 1 item Frequency categories included never, rarely, sometimes, half the time, most of the time, always</td>
<td>Higher educational aspirations positively associated with condom use for boys Greater parent support, more extracurricular involvement for boys positively associated with condom use for boys</td>
</tr>
<tr>
<td>Study (alphabetical)</td>
<td>Subjects (n size)</td>
<td>Resilience variables examined</td>
<td>Sexual risk behaviours examined</td>
<td>Findings</td>
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</tbody>
</table>
| F                   | 14-18 year old African American females in low SES communities who attended health clinics (n=609) | **Internal**  
Self- esteem  
Rosenberg self-esteem scale - standardised (Y), 10 items  
Self- efficacy for condom skills  
Condom use scale - standardised (Y), 9 items | **Sexually transmitted disease**  
Laboratory confirmed sexually transmitted disease (Y) | Low condom self-efficacy and lower perceived parental monitoring positively associated with confirmed sexually transmitted infection |
| Williams, Wingood, DiClemente, Crosby, McCree, Liau, Harrington, Davies, Hook, Oh | Data collection involved 3 components:  
Questionnaire  
Pen and paper  
Interview  
Collection of specimen | **External**  
Parental monitoring  
Survey - standardised (Y), 2 items  
Parent communication  
Survey - standardised (Y), 5 items | | |
<table>
<thead>
<tr>
<th>Study (alphabetical)</th>
<th>Subjects (n size)</th>
<th>Resilience variables examined</th>
<th>Sexual risk behaviours examined</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>12-18 year old high school students (n=12,367)</td>
<td><strong>Internal</strong>&lt;br&gt;Academic performance (GPA)&lt;br&gt;Add Health Picture Vocabulary Test standardized (Y), no. items unclear</td>
<td><strong>Condom use</strong>&lt;br&gt; <strong>Number of partners</strong>&lt;br&gt; <strong>Sexually transmitted disease</strong>&lt;br&gt;Measurement tool (validated: Yes (Y)/unclear, number of items)</td>
<td>Higher academic performance positively associated with less number of sexual partners</td>
</tr>
<tr>
<td>G</td>
<td>Data from National Longitudinal Study of Adolescent Health survey (Add Health) (Y)</td>
<td><strong>External</strong>&lt;br&gt;Parental communication&lt;br&gt;Add Health Parent Questionaire - standardized (Y), no. items unclear&lt;br&gt;Parent/Child interaction&lt;br&gt;Interview - standardised (Y), no. items unclear&lt;br&gt;Parental attitudes to adolescent sexual behaviour&lt;br&gt;Add Health Parent Questionaire - standardised (Y), no. items unclear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>In-home interview&lt;br&gt;Audio-computer-assisted self-interview&lt;br&gt;In school questionnaire&lt;br&gt;Parent questionnaire&lt;br&gt;Pen and paper</td>
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<td>G</td>
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<tr>
<td>Study (alphabetical)</td>
<td>Author/s</td>
<td>Year</td>
<td>Country</td>
<td>Subjects (n size)</td>
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</tbody>
</table>
| | Baumer and South | 2001 | USA     | 18-22 year olds (n=1,111) | **Internal**  
Education aspirations  
Survey - standardised (Y), 1 item | **Condom use**  
Survey (Y), 1 item  
Engaged in unprotected sex in the last 4 weeks | Greater parent monitoring positively associated with condom use |
| | | | | Population study with data accessed from two sources: | **External**  
Parent monitoring  
Survey - standardised (Y), 3 items  
Parent knowledge of friends  
Survey - standardised (Y), 1 item  
Peers pro childbearing attitudes  
Survey - standardised (Y), 3 items  
School connection  
Survey - standardised (Y), 3 items | **Number of partners**  
Survey (Y), 1 item  
Number of partners in last year | Peers pro-child attitudes/behaviour negatively associated with condom use |
| | | | | National Survey of Children (Y)  
Census Data (Y)  
Pen and paper | | | High educational aspirations and parents knowledge of friends positively associated with less number of partners |
<p>| | | | | | | | Peers pro-child attitudes/behaviour positively associated with increased number of partners |</p>
<table>
<thead>
<tr>
<th>Study (alphabetical)</th>
<th>Methodological approach</th>
<th>How implemented</th>
<th>Subjects (n size)</th>
<th>Resilience variables examined</th>
<th>Sexual risk behaviours examined</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Internal</td>
<td>Pen and paper</td>
<td>15-18 year old high school students (n=4,129)</td>
<td><strong>Internal</strong>&lt;br&gt;Self-esteem&lt;br&gt;Standardised (unclear), 4 items</td>
<td><strong>Number of partners</strong>&lt;br&gt;Survey (unclear), 1 item</td>
<td>Greater number of peers involved in sexual intercourse positively associated with more partners for boys</td>
</tr>
<tr>
<td>Magnani, Seiber, Gutierrez, Vereau</td>
<td>Survey questionnaire developed by Peruvian Ministry of Education</td>
<td></td>
<td></td>
<td><strong>External</strong>&lt;br&gt;Parental communication&lt;br&gt;Survey - standardized (unclear), 2 items</td>
<td>Partners in the last three months</td>
<td>Having peers that have engaged in sex associated with decrease in condom use</td>
</tr>
</tbody>
</table>

**Sexually transmitted disease**
Measurement tool (validated: Yes (Y)/unclear, number of items)
<table>
<thead>
<tr>
<th>Study (alphabetical) Author/s</th>
<th>Subjects (n size)</th>
<th>Resilience variables examined</th>
<th>Sexual risk behaviours examined</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>J Miller, Forehand, Kotchick</td>
<td>14-17 year old at risk high school students from Alabama, New York &amp; Puerto Rico (n=372)</td>
<td><strong>Internal</strong>&lt;br&gt;Self-esteem&lt;br&gt;Survey - standardised (unclear), 5 items&lt;br&gt;Educational aspirations&lt;br&gt;Survey - standardised (unclear), 2 items</td>
<td><strong>Condom use</strong>&lt;br&gt;Survey (unclear), 1 item&lt;br&gt;Frequency in life time use categories included never, less than half the time, about half the time, more than half the time, always</td>
<td>Higher self-esteem and less sexual risk taking by peers positively associated with condom use</td>
</tr>
<tr>
<td></td>
<td>Questions for survey developed from existing measures(Y) and specifically for study (unclear)</td>
<td><strong>External</strong>&lt;br&gt;Parental monitoring&lt;br&gt;Supervision Scale - standardised (Y), 4 items&lt;br&gt;Parent-adolescent communication&lt;br&gt;Survey - standardised (unclear), 10 items&lt;br&gt;Maternal attitude to sexual behaviour&lt;br&gt;Survey - standardised (unclear), 9 items&lt;br&gt;Peer sexual activity - Survey - standardised (unclear), 4 items&lt;br&gt;Neighbourhood quality - Survey - standardised (unclear), 12 items</td>
<td><strong>Number of partners</strong>&lt;br&gt;Survey (unclear), 1 item&lt;br&gt;Number of sexual partners in lifetime</td>
<td>Greater parental monitoring, parent disapproval of teenage sex and low peer group deviance positively associated with decreased number of partners</td>
</tr>
<tr>
<td></td>
<td>Interview</td>
<td></td>
<td></td>
<td>Better neighbourhood quality positively associated with increased number of partners</td>
</tr>
<tr>
<td>Study (alphabetical)</td>
<td>Subjects (n size)</td>
<td>Resilience variables examined</td>
<td>Sexual risk behaviours examined</td>
<td>Findings</td>
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<tr>
<td>K</td>
<td>13-21 year old HIV+ HIV- inpatients/outpatients (n=793)</td>
<td>Internal</td>
<td>Condom use</td>
<td>No significant association</td>
</tr>
<tr>
<td>Hein, Dell, Futterman, Rotherman-Borus, Shaffer 1995</td>
<td>Interview</td>
<td>Self- esteem</td>
<td>Survey (unclear) 1 item</td>
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<tr>
<td></td>
<td></td>
<td>Rosenberg self-esteem scale - standardised (Y), 10 items</td>
<td>Reported condom use measured on a 5 point scale 0=never, 5=always (unclear)</td>
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<tr>
<td></td>
<td></td>
<td>External</td>
<td>Number of partners</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Social support from family/friends/adult role model</td>
<td>Survey (unclear), 1 item</td>
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<tr>
<td></td>
<td></td>
<td>Social support index scale - standardised (Y), 3 items</td>
<td>Number of sexual partners</td>
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<td></td>
<td>Sexually transmitted disease</td>
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<td>Survey (unclear), 1 item</td>
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<td></td>
<td>Lifetime prevalence of STDs</td>
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<tr>
<td>Study (alphabetical)</td>
<td>Subjects (n size)</td>
<td>Resilience variables examined</td>
<td>Sexual risk behaviours examined</td>
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<tr>
<td>Author/s Year Country</td>
<td>Methodological approach</td>
<td>Internal</td>
<td>External</td>
<td>Condom use</td>
</tr>
<tr>
<td>Donald, Lucke, Dunne, O’Toole, Raphael 1994 Australia</td>
<td>14-20 year old high school students (n=932)</td>
<td>Internal</td>
<td>Communication skills about sexual behaviour &lt;br&gt;Survey questionnaire Pen and paper</td>
<td>Condom use</td>
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<td>Peer perceptions about condom use &lt;br&gt;Survey - standardised (unclear), 1 item</td>
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<td>Study (alphabetical)</td>
<td>Subjects (n size)</td>
<td>Resilience variables examined</td>
<td>Sexual risk behaviours examined</td>
<td>Findings</td>
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<td>Author/s</td>
<td>Methodological approach</td>
<td>How implemented</td>
<td>Internal</td>
<td>Condom use</td>
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<td>Year</td>
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<td>Measurement tool (validated: Yes (Y)/unclear, number of items)</td>
<td>Number of partners</td>
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<td>Internal</td>
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<td>Risk Behaviour Survey standardised (Y), 2 items</td>
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<td>13-17 year olds in low income SES communities who attended health clinics (n=195)</td>
<td>Internal</td>
<td>Frequency of condom use in the last 6 months, frequency of unprotected intercourse in the last 6 months</td>
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<td>St.Lawrence</td>
<td>Pen and paper</td>
<td>Internal/External locus of control</td>
<td>Greater internal locus of control positively associated with condom use</td>
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<td>1993</td>
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<td>Health Locus of Control Scale - standardised (Y), no. items unclear</td>
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<td>USA</td>
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<td>External</td>
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<td>Risk Behaviour Survey standardised (Y), 1 item</td>
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<td>Condom Attitude Scale standardised (Y), no. items unclear</td>
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<td>Year</td>
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<td>Subjects (n size)</td>
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<td>Pleck, Sonenstein, Ku</td>
<td>1991</td>
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<td>15-19 year old males (n=1,880) National survey of Adolescent males (Y) Pen and paper</td>
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