Factors influencing the relationship between alcohol consumption and risky sexual behaviour among young people: A systematic review

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Abstract: Within the literature, there is a well-established relationship between alcohol use and risky sexual behaviour. Three different but related explanations have been identified to account for the relationship, namely social, biological and individual. Although these explanations and the associated factors have been well explored in the literature, there is currently no empirical initiative that has shown how these factors interact with each other within the alcohol use and risky sexual behaviour relationship. The aim of the systematic review is to review and synthesise existing literature on the relationship between alcohol use and risky sexual behaviour among young adults (18–24 years old). Seventy-one articles were included in the review subsequent to a systematic search of the literature. The review highlighted three thematic domains relating to personality influences, social determinants and interpersonal factors, contributing to a more comprehensive understanding of these factors. At a foundation level, more research is required to gain new insights, discover new ideas and/or increase knowledge of a phenomenon, i.e. factors influencing the relationship between alcohol use and risky sexual behaviour among young adults.

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PUBLIC INTEREST STATEMENT

There is a substantial body of evidence documenting the relationship between alcohol use and risky sexual behaviour. However, there is a dearth of empirical evidence highlighting the nature and complexity of this relationship, especially as it relates to intensity and frequency of alcohol use and contextual variables such as socio-economic status as well as gender and age. Similarly, the links between motivations for alcohol use and sexual behaviours are not well understood. Furthermore, it is noteworthy that the alcohol use–risky sexual behaviour link has not been adequately explored in young adults. The current study reviewed the literature available since 2000 relating to factors contributing to why young adults engage in alcohol use and risky sexual behaviour. A systematic review of global research was conducted. Results indicated that personality influences, social determinants and interpersonal factors were related to alcohol use and risky sexual behaviour.
1. Introduction

There is a substantial body of evidence documenting the relationship between alcohol use and risky sexual behaviour (see Adams et al., 2014; Campbell, Williams, & Gilgen, 2002; Fritz et al., 2002; Mbulaiyete et al., 2000; Weiser et al., 2006). While the literature indicates a relationship between alcohol use and risky sexual behaviour, there is little empirical evidence highlighting the nature and complexity of this relationship, especially as it relates to intensity and frequency of alcohol use and contextual variables such as socio-economic status as well as gender and age (Cooper & Orcutt, 2000; Leigh & Stall, 1993). Similarly, the links between motivations for alcohol use and sexual behaviours are not well understood (Patrick & Maggs, 2010). It is noteworthy that high-risk sexual behaviours and the resulting health effects disproportionately affect young people.

Evidence from a 2010 National Survey on Drug Use and Health conducted among young people, predominantly urban youth located in New York City, indicated that alcohol use was highest among young adults from 21 to 25 years of age with 45.5% of these individuals reporting binge drinking and 18% reporting heavy drinking (binge drinking on five or more days) in the past month (Griffin, Scheler, Acevedo, Grenard, & Botvin, 2012). Furthermore, in a study conducted in the US, approximately 50% of all new sexually transmitted infections (STIs) in the US occurred among 15–24 year olds, and almost 50% of all new HIV infections in the US occurred in young people aged 24 years or under (CDC, 2003, Griffin et al., 2012). Brown and Vanable (2007) also found that alcohol use prior to a sexual encounter was strongly correlated to unprotected sexual intercourse encounters involving casual partners. Important to note previous research has focused on adolescents or youth in formal educational settings (Pithey & Morojele, 2002), in other words those attending school, college and/or university. Additionally, it is important at this point to note the definition of both adolescents and young adults.

According to the APA (2002), the most commonly used chronologic definition of adolescence includes ages 10–18; nevertheless, it could include 9–26 years depending on the source. “The current lack of consensus of an operational definition of adolescent chronology can be attributed to a number of factors, including: the appreciated continuity of human development; a recognition of individual, cultural, gender and racial variability; the ascribed relative salience of specific developmental milestones, and a perpetually refined science of human development in a dynamically evolving society” (Curtis, 2015, p. 9). Curtis (2015) proposes an operational definition of adolescence based in developmental science that includes ages from 11 to 25 years. In this definition, “early adolescence” and “young adulthood” are substages of this critical transitional period. With early adolescence ranging from 11 to 13 years, adolescence from 14 to 17 years and young adulthood from 18 to 24 years old. For the purpose of this study, Curtis’ (2015) operational definition will be taken into account when referring to young adults.

The relationship between alcohol use and risky sexual behaviour is complex and cannot be explained by a single mechanism. This relationship instead reflects multiple underlying causal and non-causal processes (Cooper, 2006). While there is a clear relationship between alcohol use and risky sexual behaviour, research identifies them as two separate variables interacting at a specific given point. The use of alcohol has globally been identified as the third leading risk factor for poor health (World Health Organisation (WHO), 2010). The deleterious effects of alcohol result in an estimated 2.5 million deaths every year, of which a significant proportion occur amongst young people (WHO, 2010). Previous research has shown that a range of alcohol-related problems, including poor class attendance, hangovers, trouble with authority, injuries and even fatalities, are commonly experienced by young adults engaging in heavy drinking (see Foster, Neighbors, & Young, 2013; Hingson, 2010; Hingson, Heeren,
Winter, & Wechsler, 2005). Despite these findings, heavy alcohol consumption (AC) among young adults remains normative and is increasing in prevalence within university populations (Stewart & Devine, 2000). Stewart and Devine further state that studies have shown that about one-third of undergraduate students drink at a level that produces acute physical, psychological, social and academic problems (e.g. hangovers, lowered self-esteem, sexual misconduct, missing classes). Crawford and Novak (2007) reported that students who perceive heavy drinking as a common activity at school are more likely to increase their levels of AC in order to gain social acceptance and avoid negative peer evaluations. Despite having specific policies designed to reduce students' levels of consumption, binge drinking remains a frequent recurrence and is escalating (Crawford & Novak, 2007).

Previous research (see Boer, 1994; Critchlow, 1987; Darke & Goldman, 1993; Evans & Dunn, 1995; Stacy, Widaman, & Marlatt, 1990) has identified a number of specific factors associated with heavy drinking, including demographic characteristics (gender and fraternity/sorority membership); descriptive and injunctive social norms; enhancement, social, coping and conformity drinking motives, expectancies and tendencies; and subjective evaluations of positive and negative alcohol effects. Surprisingly little research has evaluated the relative contribution of different factors in predicting AC and related problems as well as the direct impact of these constructs on binge-drinking consequences in a systematic manner (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Turrisi, Wiersma, & Hughes, 2000).

Hall, Holmqvist, Simon, and Sherry (2004) define risky sexual behaviour in terms of the behaviour itself, as well as the nature of the relationship between partners. Simply put, it can take several forms, ranging from acquiring a large number of sexual partners, to engaging in risky sexual activities and sexual intercourse under the influence of substances such as cocaine or alcohol (Hall et al., 2004). Risky sexual behaviour is identified as the second highest risk factor for harm in high mortality developing countries and constitutes 10.2% of the global burden of disease (Rehm & Room, 2003, as cited in Morojele et al., 2006). Globally there are an estimated 357 million new cases of STIs each year (WHO, 2016), with the highest rates among 20–24 year olds (Karl & Gabriele, 2005). Young adults are vulnerable for a number of reasons: their tendency to have multiple sexual partners, the urge to have sex and curiosity play a role in risky behaviour but to name a few (Caron, Davis, Wynn, & Roberts, 1992; Keeling, 1995; Micker, 1993; Okafor & Obi, 2005; Sells & Blum, 1996). Simultaneously, there has been a marked increase in the unwanted personal and social consequences associated with these behaviours such as higher prevalence of STDs, unintended pregnancies, school dropouts and heightened demands on the health and human service agencies (Langer, Warheit, & McDonald, 2001).

As reported by Langer et al. (2001), these negative social and personal consequences associated with these changes in sexual attitudes and behaviours have attracted the interest of researchers and scholars from a variety of disciplines. Researchers collectively have examined the impact of biological and psychological predispositions as well as elements derived from our social and cultural environments (Langer et al., 2001). These include psychosocial variables (e.g. norms, attitudes and self-efficacy) as well as personality traits such as sensation seeking and impulsivity (Charnigo et al., 2013; Hoyle, Fejfar, & Miller, 2000; Noar, Zimmerman, Palmgreen, Lustria, & Horosewski, 2006).

As Cooper (2002) noted, “the relationship between Alcohol use and risky sexual behaviour appears to be both complex and highly circumscribed” (p. 115), varying with characteristics of the individual drinker and the sexual situation. Although some multiple-event studies have supported the hypothesis that AC increases the likelihood of engaging in risky sexual behaviour, the findings are mixed (Cooper, Peirce, & Huselid, 1994; Graves & Hines, 1997; Morrison et al., 2003; Testa & Collins, 1997). Some authors point to an interplay between individual and environmental factors reflecting a cyclical and mutual dynamic of the individual influencing or being influenced by their environment (Choquet, 2004; Clapp, Segars, & Voas, 2002, 2008; De Jong et al., 2006; Harford, 1979; Jessor, 1998; Wechsler et al., 2002). Other authors have
found stronger results when the outcome measure was number of casual sexual partners than when it was frequency of condom use (Cooper, 2002). Graves and Hines (1997) found that AC was more common in sexual events that involved partners known for a short period of time; however, results regarding the relationship between AC and condom use were inconsistent. The interrelationships between partner type, intoxication and condom use make it difficult to disentangle alcohol’s role in unprotected sex (Abby, Parkhill, Buck, & Saenz, 2007). Although alcohol researchers focus on alcohol’s role in risky sexual behaviour, many theories of health behaviour have been applied to sexual risk taking and STD and HIV prevention (Albarracin et al., 2005).

Prior literature focused on adolescents, while less is known about how associations between substance use and risky sexual behaviour may change across young adulthood. The transition to adulthood is marked by dramatic increases in freedoms and responsibilities that occur at the same time that an individual’s ability to self-regulate is still emerging (King, Nguyen, Kosterman, Bailey, & Hawkins, 2012). However, how the associations between substance use disorders and risky sexual behaviours unfold across young adulthood remains unclear. (King et al., 2012). Despite the strong link between alcohol use and risky sexual behaviour, researchers have not adequately explored this relationship among young adults. The studies that have been conducted focused primarily on adolescents in formal educational settings (Cooper, 2002; Flisher et al., 1996 cited in Pithey & Morojele, 2002), clinic-based populations receiving treatment for STIs and HIV (Kalichman, Simbayi, Cain, & Jooste, 2007). It is important to note that the majority of studies that have linked alcohol use and risky sexual behaviour have been carried out in the developed world and among high school or college students (Khasakhala & Mturi, 2008). In a study conducted by Griffin et al. (2012), they found that these behaviours peak during the early to mid-twenties as young people live more independently and autonomously from their family of origin, enjoy new freedoms such as legal drinking and the ability to enter bars and nightclubs, and have increased opportunities for sexual and romantic relationships. With statistics suggesting that the age group of 18–25 years is most vulnerable in terms of abusing alcohol (South African Community Epidemiology Network on Drug Use [SACENDU], 2011), it is imperative to explore the link between alcohol use and risky sexual behaviour in this cohort. This would contribute to a more comprehensive understanding of the relationship between alcohol use and risky sexual behaviour as suggested by Adams et al. (2014).

1.1. Rationale
Within the literature, there is a well-established relationship between alcohol use and risky sexual behaviour (Adams et al., 2014; Campbell et al., 2002; Fritz et al., 2002; Mbulaiteye et al., 2000; Weiser et al., 2006). This relationship has emerged as a major health concern especially among young adults between the ages of 18–25 (Morojele et al., 2004; SACENDU, 2011). Freeman and Parry (2006) have identified three different but related explanations to account for the relationship, namely social, biological and individual. Although these explanations and the associated factors have been well explored in the literature, there is currently no empirical initiative that has shown how these factors holistically interact with each other within the alcohol use and risky sexual behaviour relationship. The current study hopes to contribute in this regard by systematically reviewing the literature with the ultimate aim of informing future studies. It is anticipated that this would contribute to a more comprehensive understanding of the factors influencing the relationship between alcohol use and risky sexual behaviour among young adults and better inform intervention strategies.

1.2. Aim
The aim of the systematic review is to review and synthesise existing literature on the factor that influence the relationship between alcohol use and risky sexual behaviour among young adults (18–24 years old).

2. Method
We performed a systematic review of published studies since 2000 to identify the factors influencing the relationship between alcohol use and risky sexual behaviour among young
people (age 18–24 years). The findings of this review will provide evidence-based knowledge critical for addressing the aim and specific objectives.

2.1. Review question

- What factors influence the relationship between alcohol use and risky sexual behaviour among young adults?

2.2. Article search

Various resources, published in English from the year 2000 to present, were consulted for the review. Based on the nature of the topic, ScienceDirect and EBSCOhost were the main sources for the search. Databases within EBSCOhost included PsycARTICLES, SocINDEX, and Academic Search Complete. Once the articles had been appraised, manual searching of reference lists then took place. An initial review of relevant literature was conducted to identify key studies in the field. The following keywords formed part of the initial search within the above-mentioned databases: prevalence, alcohol consumption, risky sexual behaviour, alcohol use and risky sexual behaviour, participants, risk and protective factors, extraneous factors, at-risk behaviour and risk-taking behaviour. Within the searches that were initially conducted, it was found that the initial keywords did not yield the expected number of studies pertaining to the topic or no results were yielded. It was therefore decided to use the following terms: alcohol consumption, risky sexual behaviour, young people, young adults, risk and protective factors, contributing factors and influences.

2.3. Inclusion/exclusion criteria

Included studies were original English-language research articles published in peer-reviewed literature which reported on both quantitative and qualitative studies that focused on the factors impacting on the relationship between alcohol use and risky sexual behaviour among young people. The review did not attempt to categorise studies in terms of these two methods of research, but instead to provide a comprehensive picture of studies exploring the factors contributing to alcohol use and risky sexual behaviour. The review included both males and females between the ages of 18–24 years. Any racial, ethnic, cultural or religious groups were eligible for inclusion, regardless of geographic region. Articles pertaining to sexual violence, sexual coercion, intimate partner violence, HIV/AIDS and alcohol use disorders were not included in the review as there has been a paucity of research conducted to adequately address the extraneous factors contributing to the relationship between alcohol use and risky sexual behaviour (Morojele et al., 2006; Scott-Sheldon et al., 2012). Furthermore, studies focusing on age groups other than young adults and studies focusing on substance use in general were also excluded from the review.

2.4. Quality assessment

Study quality assessment is relevant to every step of a review. The assessment is crucial in evaluating the strengths, weaknesses and benefits of the assumptions and conclusions made in the study, as well as exploring heterogeneity and informing decisions regarding suitability of meta-analysis. In addition, they help assess the strength of inferences and make recommendations for future research. The selection of studies to be included in the review was thus assessed by utilising an adapted version of the Evaluation Tool for Qualitative Studies and The Evaluation Tool for Quantitative Research Studies (Long, Godfrey, Randall, Brettle, & Grant, 2002; Long & Godfrey, 2004).

2.5. Data extraction

Using the template in Table 1 (Appendix), data was extracted at various stages, namely assessment of eligibility, assessment of quality, assessment of study characteristics and extraction of study findings. The table utilised for data extraction has been formatted to extract data specifically relevant to the research question, which includes the study authors, aim, sample size, participant characteristics, research design, outcomes, themes and self-concept domain.
2.6. Data synthesis
Data was summarised by means of tabulation of study characteristics, quality and effects as well as statistically if they are sufficiently similar and if they are of adequate quality to explore differences between studies and combining their effects (meta-analysis). The Textual Narrative Analysis approach as proposed by Lucas, Arai, Baird, and Roberts (2007) was utilised. This method synthesises the studies used for review by study characteristics, context, quality and findings that are reported on. Structured summaries were then developed, expanding on and illuminating the context of the extracted data. This method was utilised as this approach typically groups studies into more homogenous groups, synthesising different types of research evidence and making explicit the diversity in study designs and contexts (Lucas et al., 2007).

3. Results
The aim of the systematic review is to review and synthesise existing literature on the factors that impact on the relationship between alcohol use and risky sexual behaviour among young adults (18–24 years old). The results of the systematic review are structured as follows: type of research, scope and focus of research, context of the studies, quality (content and method of the studies), age cohort, theory and findings, as proposed by Lucas et al. (2007) in the Textual Narrative Analysis. A detailed summary of the final search procedure will be outlined below followed by a comprehensive explanation of the findings.

3.1. Article search procedure
The keyword search yielded a total of 4,149 articles with 196 titles identified as relevant and were included for the abstract appraisal. The 147 articles that were excluded did not meet the inclusion criteria as they focused on other substances, HIV/AIDS-related cases, intimate partner violence and other age groups. Of the 196 abstracts, 29 were included for full-text appraisal. After a full-text appraisal, only 23 articles were included in the review. Based on reference list mining of the included articles, an additional 28 articles were identified as relevant for full-text appraisal. This process is outlined in Figure 1.

![Figure 1. Article search and appraisal process](https://www.example.com/figure1.png)

3.1.1. Type of research
The 51 articles included in the review can broadly be categorised into two types, that is, empirical work and review articles on alcohol use and risky sexual behaviour. Forty-five articles were classified as empirical articles utilising both qualitative and quantitative methods, as well as longitudinal studies with various age cohorts of young people ranging from children in school, adolescents in high school, college and university students, employed and unemployed youth, drinkers and non-drinkers. Additionally, six of the articles were review articles, consisting of literature reviews and systematic
reviews focusing on various aspects of the relationship between alcohol use and risky sexual behaviour, such as the nature of the relationship, the motivations for engaging, and risk and protective factors.

| Table 1. Type of research article |
|----------------------------------|
| **Article type** | **Amount** | **Authors** |
| Empirical article | 45 | Abbey et al. (2005); Abby et al. (2007); Adams et al. (2014); Bailey et al. (2011); Brown and Vanable (2007); Charnigo et al. (2013); Connor et al. (2013); Foster and Neighbors (2013); Griffin et al. (2012); Gullete and Lyons (2006); Khasakhalo and Mturi (2008); King et al. (2012); Kogan et al. (2010); LaBrie et al. (2011); LaBrie, Pedersen, Neighbors, and Hummer (2008); Langer et al. (2001); Lewis et al. (2014); Littleton, Breikopf, and Berenson (2007); Miller et al. (2003); Muchimba et al. (2013); Murry et al. (2013); Neighbors et al. (2007); Oei and Jardim (2007); Orchowski and Barnett (2012); Park and Grant (2005); Parks et al. (2008); Patrick (2013); Patrick and Maggs (2010); Quinn and Fromme (2010); Radanilena-Hita (2015); Randolph, Torres, Gore-Felton, Lloyd, and McGarvey (2009); Schraufnagel et al. (2010); Seth et al. (2011); Sommez et al. (2006); Stappenbeck et al. (2013); Stuewig et al. (2015); Townsend et al. (2011); Townshend et al. (2014); Turrisi et al. (2000); Vivancos, Abubakar, Phillips-Howard, and Hunter (2013); Voisin et al. (2013); Walsh et al. (2014); Walsh et al. (2013); Wayment and Aronsen (2002); Wetherill et al. (2010) |
| Review article | 6 | Cooper (2002); Cooper (2006); Kuntsche et al. (2005); Oei and Morawska (2004); Pithey and Morojele (2002); Vicary and Karshin (2002) |

3.1.2. Scope and focus of research

The research focus of the 45 studies in the review can generally be divided into three thematic domains, namely

1. Personality influences on alcohol use and risky sexual behaviour
2. Social determinants of alcohol use and risky sexual behaviour
3. Interpersonal factors related to alcohol use and risky sexual behaviour (see Table 2).

These domains will be discussed in greater detail below.

| Table 2. Thematic domains |
|---------------------------|
| **Thematic domain** | **Authors** |
| 1. Personal influences on alcohol consumption and risky sexual behaviour | Charnigo et al. (2013); Griffin et al. (2012); Gullete and Lyons (2006); LaBrie et al. (2008); Littleton et al. (2007); Miller et al. (2003); Murry et al. (2013); Oei and Morawska (2004); Quinn and Fromme (2010); Stuewig et al. (2015) |
| 2. Social determinants of alcohol consumption and risky sexual behaviour | Abbey et al. (2005, The); Abby et al. (2007); Bailey et al. (2011); Connor et al. (2013); Khasakhalo and Mturi (2008); King et al. (2012); Kuntsche et al. (2005); Lewis et al. (2014); Orchowski and Barnett (2012); Oei and Jardim (2007); Neighbors et al. (2007); Parks et al. (2008); Patrick (2013); Pithey and Morojele (2002); Seth et al. (2011); Stappenbek et al. (2001); Townsend et al. (2011); Turrisi et al. (2000); Vicary and Karshin (2002); Walsh et al. (2013) |
| 3. Interpersonal factors related to alcohol consumption and risky sexual behaviour | Adams et al. (2014); Brown and Vanable (2007); Cooper (2002); Cooper (2006); Kogan et al. (2010); LaBrie et al. (2011); Langer et al. (2001); Muchimba et al. (2013); Park and Grant (2005); Patrick and Maggs (2010); Radanilena-Hita (2015); Randolph et al. (2009); Schraufnagel et al. (2010); Sommez et al. (2006); Townshend et al. (2014); Vivancos et al. (2013); Voisin et al. (2013); Walsh et al. (2014); Wayment and Aronsen (2002); Wetherill et al. (2010) |
3.2. Thematic domains

3.2.1. Personality influences on alcohol use and risky sexual behaviour

Studies in this domain focused on how personality traits influence their motivation to engage in risky alcohol use, risky sexual behaviour and/or the combination of the two. More specifically, the articles focused on concepts like, self-efficacy, self-regulation, impulsivity, self-esteem, self-awareness, self-consciousness, sensation seeking but to name a few. This domain included 14 studies. Using Textual Narrative Analysis as a guide, it is discussed specifically in terms of (1) content, (2) age cohort, (3) context, (4) method, and (5) theory.

3.2.1.1. Content. The content and specific focus of the research studies in this domain ranged from elucidating the joint contribution of sensation seeking and impulsivity to decision-making to risk behaviours (Charnigo et al., 2013), evaluating self-consciousness, self-awareness, drinking identity, sensation seeking, self-esteem, as a moderator or contributor to risky alcohol use and subsequent risky sexual behaviour (Gullete & Lyons, 2006; Miller et al., 2003). Studies (Quinn & Fromme, 2010) also focused on self-regulation as buffering risk associated with alcohol use and as a protective factor to heavy drinking and unprotected sex. Other studies focused specifically on gender differences (Morojele et al., 2006), individual competencies (Stuewig et al., 2015), distinct facets of impulsivity and its contribution to alcohol use outcomes (Shin, Hong, & Jeon, 2012), examining restraint and temptation (Rinker & Neighbors, 2013), and drinking refusal self-efficacy (DRSE) (Oei & Morawska, 2004).

3.2.1.2. Age cohort. The review of literature showed that studies in this research area focused predominantly on young adults between the ages of 17 and 26 years. Two longitudinal studies focused on a specific cohort at two points in their lives, one focused on a mean age of 14.6 years and the second point was at a mean age of 22.8 (Griffin et al., 2012), the second study’s first point was at age 10−12 years and the second point was at 18−21 years (Stuewig et al., 2015).

3.2.1.3. Context. The context of the research studies which focused on alcohol use and risky sexual behaviour among young adults were conducted primarily in various states in the US, specifically various states in the US. Studies were predominantly conducted amongst university students in both the private and public sectors. Studies were also conducted in both low-income communities and middle-income communities.

3.2.1.4. Method. The majority of the studies utilised quantitative methods (n = 9 of 10) with most utilising self-reported questionnaires or computer or online-based surveys. Three studies were longitudinal studies that each had two contact points with individuals that reported on how behaviours at point one could be possible predictors for behaviour at point two (Griffin et al., 2012; Quinn & Fromme, 2010; Stuewig et al., 2015). All studies (n = 9) were generally descriptive studies that utilised correlation analysis and one utilising structural equation model (Murry, Simons, Simons, & Gibbons, 2013). The one review study focused on key constructs of alcohol expectancies (AEs) and DRSE to explain the acquisition and maintenance of binge drinking.

3.2.1.5. Theory. There were only 5 of the 10 studies which used a theoretical framework to guide their study. Four of the eight studies utilised the Five-Factor Model of Personality (Charnigo et al., 2013; Miller et al., 2003; Shin et al., 2012; Stewart & Devine, 2000) to synthesise and interpret the findings of their study. Other studies utilised Transtheoretical Model of Behavioral Change (Gullete & Lyons, 2006) and Alcohol Expectancy Theory (Oei & Morawska, 2004). One study utilised the theory behind self-regulation and sensation seeking to synthesise and explain the findings (Table 3) (Quinn & Fromme, 2010).
Table 3. Personality influences on alcohol consumption and risky sexual behaviour

| Author                  | Focus of research                                                                 | Age cohort and sample composition | Area/context                                                                 | Method                                      | Framework                             |
|-------------------------|------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------|
| Charnigo et al. (2013)  | Elucidate the joint contribution of sensation seeking and impulsive decision-making, to HIV = STD risk behaviours among young adults | \( n = 2,386 \) young adults aged 18-26 years Various ethnic groups | Data utilised from a larger study from two cities: Lexington, Kentucky, and Knoxville, Tennessee (Zimmerman et al., 2007) | Quantitative (survey)                       | Five-factor model of personality (Zuckerman, 1994) |
| Griffin et al. (2012)   | Examined the extent to which high-risk drinking and sexual behaviour clustered together | Sample 1: ninth-grade mean age = 16.6 years Sample 2: adult assessment, mean age = 22.8 years (\( N = 692 \)) | Participants were part of a larger school-based drug abuse and violence prevention trial | Quantitative (self-reported questionnaire—initial; telephonic interview—adult assessment) | None                                    |
| Gullete and Lyons (2006)| Examined the relationships of sexual sensation seeking, self-esteem and self efficacy in condom use, and alcohol consumption to HIV risk-taking behaviours | \( n = 3,000 \) college students, 18-43 years | Participants were located at a university in the southern US. | Quantitative (this study was a descriptive and correlational survey) | Transtheoretical Model of Behavioral Change |
| LaBrie et al. (2008)    | Examines the role self-consciousness plays in the experience of alcohol-related consequences | \( n = 1,168 \) student members of 20 campus organisations between 18 and 21 years 1% older | West Coast University (USA) | Quantitative (online survey) |                                        |
| Littleton et al. (2007) | Examined the associations between a history of physical or sexual abuse and recent sexual risk behaviours among adult women | 1,428 women aged 18-40 years old, who visited one of two clinics offering comprehensive reproductive healthcare | A low-income community in Southeast Texas | Quantitative (survey) |                                        |
| Miller et al. (2003)    | Explores the relations between the Five Factor Model of personality and a variety of risky sexual behaviours | \( n = 242 \) men and \( n = 239 \) women Mean age = 21 | | Quantitative (questionnaires) | Five Factor Model of personality |

(Continued)
| Author | Focus of research | Age cohort and sample composition | Area/context | Method | Framework |
|--------|------------------|-----------------------------------|--------------|--------|-----------|
| Oei and Morawska (2004) | Develops a cognitive model using the key constructs of alcohol expectancies and drinking refusal self-efficacy to explain the acquisition and maintenance of binge drinking | Adolescents and young people Literature on binge drinking | Literature review | Alcohol Expectancy Theory |
| Quinn and Fromme (2010) | Examined whether self-regulation was a protective factor against heavy episodic drinking, alcohol-related problems and unprotected sex among emerging adults | n = 1,136 completed both surveys Survey 1: 17–19 years Survey 2: mean age 21–75 years | University of Texas at Austin | Quantitative (longitudinal study; survey) | Self-regulation and sensation seeking |
| Stuewig et al. (2015) | Investigates the role of individual competence factors as modifiers of the risk for adult substance and alcohol abuse in relation to living in high- or low-income areas | Study 1: n = 80, fifth graders (ages 10–12) Study 2: 68% re-interviewed (ages 18–21) | Nine public elementary schools in a suburban Washington DC | Longitudinal study | None |
3.2.2. Social determinants of alcohol use and risky sexual behaviour

The studies in this domain explored the social, contextual and environmental factors impacting on the relationship between alcohol use and risky sexual behaviour. More specifically the articles focusing on social aspects including social norms, motives assumptions and beliefs in the social context. Contextual aspects focused on the context in which alcohol use and risky sexual behaviour takes place. Lastly environmental aspects focus on the historical construction of communities.

3.2.2.1. Content. The content and specific focus of the research studies in this domain consisted of an array of focal areas including assumptions of environmental approaches to alcohol use (Clapp et al., 2002), normative perceptions (Lewis, Patrick, Mittmann, & Kaysen, 2014), social norms, demographics, drinking motives and AEs in predicting AC and related problems (Neighbors et al., 2007), the nature of the relation among drinking beliefs, drinking tendencies, perceived sexual control (Walsh et al., 2013), behavioural consequences (Turrisi et al., 2000) and effects of alcohol use on condom use (Abby, Saenz, & Buck, 2005). Further studies explore alcohol use and risky sexual behaviour (Abby et al., 2007; Orchowski & Barnett, 2012; Seth, Wingood, DiClemente, & Robinson, 2011). Contextual aspects include the extent to which Spring Break drinking and sexual behaviours are related (Patrick, 2013), rates of risky sexual behaviour among women bar drinkers (Parks, Hsieh, Levonyan-Radloff, & King, 2008) and reducing sexual risk behaviours among university students in particular (Connor, Psutka, Cousins, Gray, & Kypri, 2013). Further studies focus on identifying patterns of alcohol use behaviours and AEs among women (Stappenbeck et al., 2013), the relationship between binge drinking, “reflection impulsivity” alcohol-related expectancies and unplanned sexual behaviour in a sample of young social drinkers (Townsend et al., 2011). Environmental aspects include studies focusing on the extent of the current alcohol problem as well as a historical perspective (Vicary & Karshin, 2002), how alcohol misuse increases the occurrence of sexual risk behaviour in South African communities (Pithey & Morojele, 2002) and describing an example of the use of latent variable modelling to create measures of complex phenotypes and environments that illustrate the utility of the general versus specific conceptualisation (Bailey, Hill, Meacham, Young, & Hawkins, 2011).

3.2.2.2. Age cohort. The review of literature showed that studies in this research area focused predominantly on young adults between the ages of 17 and 35 years. One longitudinal study focused on fifth graders at its first point of contact and adults were later retained at 24 years old (Bailey et al., 2011).

3.2.2.3. Context. The context of the research studies focused young adults in relation to social, contextual and environmental aspects of alcohol use and risky sexual behaviour primarily in countries outside of South Africa, specifically various states in the US. Studies were predominantly conducted in schools, colleges and universities in both the private and public sectors. Studies were also conducted in both low-income communities and middle-income communities. Two studies were conducted in South Africa, one in an impoverished community on the Cape Flats (Abby et al., 2007) and the other in broader South African communities (Pithey & Morojele, 2002).

3.2.2.4. Method. It was found that most studies in this domain utilised quantitative methods (n = 16). Various designs and data analysis techniques were used in these studies. The research designs used included correlational designs, cross-sectional and longitudinal designs. Many of these quantitative studies used independent and correlational techniques such as multiple, hierarchical and logistic regression (Abby et al., 2005; Abby et al., 2007; Bogg & Finn, 2009; Connor et al., 2013; Lewis et al., 2014; Neighbors et al., 2007; Orchowski & Barnett, 2012; Parks et al., 2008; Seth et al., 2011; Turrisi et al., 2000). Two of the studies made use of latent analysis (Stappenbeck et al., 2013; Townsend et al., 2011), and one study made use of path modelling procedures (Walsh et al., 2013). Three of the articles in this domain were review articles (Pithey & Morojele, 2002; Vicary & Karshin, 2002).

3.2.2.5. Theory. There were only three studies which used a theoretical framework to guide their study. These studies all utilised different theories to guide their study. Theories considered problem behaviour theory (Murry et al., 2013) and traumagenic dynamics theory (Walsh et al., 2013).
| Author                  | Focus of research                                                                 | Age cohort and sample composition                                                                 | Area/context                                                                 | Method                           | Framework                      |
|------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------|--------------------------------|
| Abbey et al. (2005)    | Examines the effects of alcohol consumption on condom use                           | 195 females 103 males aged between 21 and 35 years                                                 | Large urban university                                                        | Quantitative (self-reported questionnaire) | None                           |
| Abby et al. (2007)     | Explores alcohol use and risky sexual behaviour among young adults in a low-income community in Cape Town | n = 143 (18–25 years)                                                                            | An impoverished community on the Cape Flats in the Western Cape, South Africa | Quantitative descriptive correlational design                                  | None                           |
| Bailey et al. (2011)   | Describes an example of the use of latent variable modelling to create measures of complex phenotypes and environments that illustrate the utility of the general versus specific conceptualisation | Fifth-grade students (N = 765) = 49% female, 51% male, ethnically diverse 95% (752) retained at age 24 | Seattle Social Development, a longitudinal study of the development of positive and antisocial project behaviours | Secondary data from a longitudinal study                                     | None                           |
| Connor et al. (2013)   | Informing potential interventions to reduce sexual risk behaviours among university students, in particular, and young people, in general | n = 5,770 students aged between 17 and 25 years                                                    | 8 New Zealand campuses                                                        | A cross-sectional web-based survey.                                         | None                           |
| Khasakhala and Mturi (2008) | Examines factors that may predispose unmarried and unemployed out-of-school youth to risky sexual behaviour | n = 6,129 male and female unmarried and unemployed out-of-school youth aged between 15 and 24 years | Based on data gathered from the Behaviour Surveillance Survey, Kenya           | Quantitative (structured questionnaire)                                      | None                           |
| King et al. (2012)     | Associations between substance use disorder symptoms and high-risk sexual behaviours change across young adulthood | Seattle Social Development Project, recruited in 1985 from 18 elementary schools drawn from high-crime neighbourhoods at ages 15, 17, 19, 21, 24, 27 and 30 years | High-crime neighbourhoods                                                     | Quantitative = longitudinal study                                            | State- and trait-level theories |
| Kuntsche et al. (2005)  | Reviews evidence of adolescent and young adult drinking motives and their relation to possible consequences over the last 15 years | Include articles published only in English. The literature search was restricted to publications from 1989 onwards, age group of 10 to 25 year olds | Predominantly North America                                                    | Systematic review                                                             | The motivational model          |
| Lewis et al. (2014)    | Examining Spring Break-specific normative perceptions of sexual risk behaviour and the role that these perceptions and taking a trip with a friend or with a romantic partner have on Spring Break sexual behaviour | N = 1,540 students Caucasian and Asian with a mean age of 20.3 years | A large public northwestern university                                        | Quantitative (online survey)                                                | None                           |

(Continued)
| Author | Focus of research | Age cohort and sample composition | Area/context | Method | Framework |
|--------|-------------------|-----------------------------------|--------------|--------|-----------|
| Murry et al. (2013) | Identifies mechanisms that forecast rural African-American males’ susceptibility to risk behaviours over time | Approximately 78% of the original sample was maintained across five waves (W1:10.5 years; W5: 20 – 21 years). N = 889 African-American families in Iowa and Georgia N = 411 families with male youth were included | Iowa and Georgia | Quantitative (questionnaires) | Conceptual model (family and economic stress theories and problem behaviour theory) |
| Oei and Jardim (2007) | Determines whether alcohol expectancies (AE) and DRSE predict alcohol consumption in Asian students | Caucasian (n = 98) and Asian (n = 92) student samples. Mean age = 21.18 years | First-year psychology class | Quantitative (questionnaire) | AE and DRSE |
| Orchowski and Barnett (2012) | Explores the relationship between alcohol use and experience of alcohol-related sexual consequences (ARSC) during the transition from high school to the first year of college | 447 men and 606 women with a mean age of 18.4 years and varied ethnicity | New England colleges/universities | Quantitative (web survey) | |
| Neighbors et al. (2007) | Evaluates the relative contribution of social norms, demographics, drinking motives and alcohol expectancies in predicting alcohol consumption and related problems among heavy drinking college students | 17–21 years 818 (57.6% women) first year undergraduates | West Cost university (USA) | Quantitative (web-based assessments) | |
| Parks et al. (2008) | To assess the rates of risky sexual behaviour among women bar drinkers, as well as differences in predictors of risky sexual behaviour, based on partner type—new or regular | 18–30 years 241 women Various ethnic groups | Women bar drinkers | Quantitative (interviews) | |
| Patrick (2013) | The extent to which Spring Break drinking and sexual behaviours are related | 18–21 years, n = 263; 55% women | Students planning on going on a Spring Break trip | Quantitative (web survey) | |
| Pithey and Marojele (2002) | Focus on how alcohol misuse increases the occurrence of sexual risk behaviour in South African communities | Articles on alcohol use and risky sexual behaviour in South Africa | South Africa | Review of literature | |
| Seth et al. (2011) | Examined the relationship between alcohol use at non-abuse levels and risky sexual behaviours and sexually transmitted infections (STIs) among young adult African-American women | 18–29 years, n = 979, 86.6% completed baseline assessments, 78.9% and 79.4% completed 6 and 12 months follow-up, respectively | Members from three Kaiser Permanente Centers having the greatest number of African-Americans in Atlanta, GA. | Quantitative (audio computer-assisted survey interview) | |
| Author                  | Focus of research                                                                 | Age cohort and sample composition      | Area/context                  | Method                                      | Framework            |
|-------------------------|-----------------------------------------------------------------------------------|----------------------------------------|-------------------------------|---------------------------------------------|----------------------|
| Stappenbek et al. (2001) | To identify patterns of alcohol use behaviours and alcohol expectancies among women who are non-problem drinkers and to examine how these patterns are associated with indices of sexual risk | 18-35 years, 758 women, various ethnic groups | USA                           | Quantitative (questionnaire — various scales) |                      |
| Townsend et al. (2011)  | The aim of this study was to examine the relationship between binge drinking, “reflection impulsivity” alcohol-related expectancies and unplanned sexual behaviour in a sample of young social drinkers | 18 and 34, n = 92 (43 males and 49 females) | Cape Town, South Africa       | Quantitative (questionnaire)               |                      |
| Turrisi et al. (2000)   | The nature of the relation among drinking beliefs, drinking tendencies and behavioural consequences | Mean age of 18.24 years, n = 266         | US: a moderately sized northwestern university | Quantitative (battery of questionnaires)    |                      |
| Vicary and Karshin (2002)| This article reviews the extent of the current alcohol problem as well as a historical perspective | n = 2,000, college students aged 18-24 years | US Colleges and universities | Review survey of literature                | None                 |
| Walsh et al. (2013)     | Test a path model that included perceived sexual control, sex-related alcohol expectancies and likelihood of risky sexual behaviour when drinking as mediators between CSA and adult substance facilitated rape | n = 546 female college students Mean age = 18.7 years | All female students enrolled in an introductory psychology course over three consecutive semesters | Quantitative (anonymous surveys) | Traumagenic dynamics theory |
Another study utilised a conceptual model, more specifically family and economic stress theories and problem behaviour theory (Murry et al., 2013). Lastly, Oei and Jardim (2007) utilised the theory behind AEs and drink refusal self-efficacy to shape and guide their study (Table 4).

3.2.3. Interpersonal factors related to alcohol use and risky sexual behaviour
The studies in this domain focused on the family, peers, risk and protective factors, and personal attributes. The articles that focused broadly on the family and, in particular, parental and family influence and parental and family beliefs. Peer aspects focused on the relationship between young adults and their peers. These factors included perceived care of friends, role modelling, and perceived alcohol use and sexual behaviour of friends. Personal attributes refer to attitudes, race, gender, genetics and religiosity. Lastly, risk and protective factors also emerged in this domain. Using Textual Narrative Analysis as a guide, it is discussed specifically in terms of content, age cohort, context and method, and theory.

3.2.3.1. Content. The content and specific focus of the research studies in this domain broadly considered the relationship between alcohol use and risky sexual behaviour to more individual, family and peer aspects. More specifically, exploring the relationship between alcohol use and risky sexual behaviour as a phenomenon (Adams et al., 2014; Cooper, 2002, 2006), associations across motivations for engaging in alcohol use and risky sexual behaviour (Patrick & Maggs, 2010), to illuminating our understanding of sexual behaviour (Marston & King, 2006), risk and protective factors (Kogan et al., 2010; Langer et al., 2001; Voisin, Hutton, Tan, & DiClemente, 2013), and protective behavioral strategies (LaBrie, Lac, Kenney, & Mirza, 2011). Individual aspects such as gender and psychological risk and protective factors (Park & Grant, 2005), cognitive and affective attitudes, personal normative beliefs, social determinants and expectations (Sonmez et al., 2006) and the impact of partner type (Brown & Vanable, 2007). Family relationships focused on parental mediation and critical thinking (Radanielina-Hita, 2015). Peer relationships, with specific reference social relationships (Townshend, Kambouropoulos, Griffin, Hunt, & Milani, 2014), perceived awareness and caring, or know or care about student’s behaviour (Wetherill, Neal, & Fromme, 2010).

3.2.3.2. Age cohort. The review of literature showed that studies in this research area focused predominantly on young adults between the ages of 15 and 35 years. One mixed-method study focused on 18–62 year olds (Townshend et al., 2014).

3.2.3.3. Context. The context of the research studies focused on young adults in relation to family, peers and individual aspects relating to alcohol use and risky sexual behaviour primarily in countries outside of South Africa. Studies were predominantly conducted in colleges and universities in both the private and public sectors. Studies were also conducted in both low-income communities and middle-income communities. Two studies were conducted in South Africa, one in an impoverished community on the Cape Flats (Adams et al., 2014) and the other in one of the poorest suburbs in South Africa, average household income is less than R1500 pm and unemployment is high (Townshend et al., 2014). Four reviews were conducted within this domain focusing on published articles worldwide (Cooper, 2002, 2006; Marston & King, 2006).

3.2.3.4. Method. It was found that most studies in this domain utilised quantitative methods (n = 15). Various designs and data analysis techniques were used in these studies. The designs ranged from correlation designs, to survey designs, and cross-sectional and longitudinal designs. Data analysis techniques used ranged from structural equation modelling (Radanielina-Hita, 2015; Schraufnagel, Davis, George, & Norris, 2010; Wayment & Aronson, 2002) and generalised estimating equations (Voisin et al., 2013; Wetherill et al., 2010), to various types of regression (Brown & Vanable, 2007; Kogan et al., 2010; Langer et al., 2001; Sonmez et al., 2006). Two studies used structural correlational analysis (Adams et al., 2014; Park & Grant, 2005), while one study utilised latent profile analysis (Patrick & Maggs), and another utilised path analysis (Walsh, Latzman, & Latzman, 2014). It was noted that only
| Author               | Focus of research                                                                 | Age cohort and sample composition | Area/context                                                                 | Method                                                                 | Framework                                                                 |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Adams et al. (2014)  | Explores alcohol use and risky sexual behaviour among young adults                 | *n* = 143, aged 18–25 years       | An impoverished community on the Cape Flats, Western Cape, SA                  | Quantitative (descriptive correlational design)                         | None                                                                       |
| Brown and Vanable (2007) | Clarify the impact of partner type on the alcohol-risky sex association            | *N* = 547 mixed race, with a mean age of 19 years, 67% female | Introductory psychology courses                                               | Quantitative (self-administered questionnaire)                         | Myopia Theory                                                             |
| Cooper (2002)        | To evaluate the empirical associations between alcohol use and risky sex at two levels of analysis | Published in the past 10 years and using event level methodology or random sampling were emphasised | Published articles                                                          | Review                                                                 | Myopia Theory and Expectancy models and spurious model                   |
| Cooper (2006)        | Reflects multiple underlying processes of relationship between AU and RSB that are both causal and non-causal | Articles based on theories trying to explain the relationship between alcohol use and risky sexual behaviour | Published articles                                                          | Review of literature                                                     |                                                                            |
| Kogan et al. (2010)  | Examined the protective influence of several variables hypothesised either to reduce unprotected intercourse or improve the influence of risk factors | African-Americans aged 18–21 years, not attending high school or enrolled full-time college or university | Seven counties in central Georgia                                            | Quantitative (audio computer-assisted self-interviews)                  | Ecological and self-regulatory theories of risk behaviour                 |
| LaBrie et al. (2011) | Examined the extent to which PBS mediated the influence of drinking motives       | *N* = 1,592 with a mean age of 19.94 years; 76.9% Caucasian                  | Two universities (public and private)                                        | Quantitative (online surveys)                                          | Mediational Model                                                         |
| Langer et al. (2001) | Understanding of the risk and protective factors on which many prevention programmes | *N* = 388 aged between 17 and 27 years, 72.0% Hispanic                      | Urban university in South Florida                                            | Quantitative (285-item questionnaire)                                  |                                                                            |
| Muchimba et al. (2013) | Examined alcohol use frequency in adolescence as a predictor of HIV sexual risk behaviour in adulthood | Initial assessment: 15–18 years Second assessment: mean time between assessments = 8.3 years Varied ethnicity distribution | Colorado                                                                    | Quantitative (questionnaires)                                          |                                                                            |
| Author | Focus of research | Age cohort and sample composition | Area/context | Method | Framework |
|--------|-------------------|-----------------------------------|--------------|--------|-----------|
| Park and Grant (2005) | Examine the influence of alcohol consumption, gender and psychological risk and protective factors on college students’ experiences of negative and positive consequences | 86 men, 97 women; varied ethnicity mean age = 19 | University of Connecticut | Quantitative (questionnaire) | |
| Patrick and Maggs (2010) | Person-centred associations in motivations across motivations for alcohol use and sexual behaviour | 18-20-year-old first year students and US citizens or permanent residents | US, northeastern university | Quantitative (web surveys) | |
| Radanielina-Hita (2015) | Parental mediation and critical thinking—that may influence the decision-making process | N = 658 aged between 18 and 21 years | Northwestern American university | Quantitative (online questionnaire) | Message Interpretation Model |
| Randolph et al. (2009) | To assess the role of gender and ethnicity in the relationship between alcohol use and risky sexual behaviour | 18-34 years, n = 425 (265 females and 160 males) | A southern university, USA | Quantitative (questionnaire) | |
| Sonmez et al. (2006) | How cognitive and affective attitudes, personal normative beliefs, social determinants, expectations and pacts influence intentions of excessive alcohol consumption and casual sex | N = 534, age = 18-25 years | One northeastern and one southwestern university | Quantitative (cross-sectional—questionnaire) | The Theory of Interpersonal Behavior |
| Townshend et al. (2014) | Dynamics of social relationships in which alcohol use and risky sexual behaviours occur | N = 421 men aged 18-62 years | One of the poorest suburbs in South Africa | Mixed-methods (quantitative survey and in-depth interview) | |
| Schraufnagel et al. (2010) | Explored a potential connection between CSA and an increased likelihood of risky sexual behaviour in adulthood | n = 280 males aged between 21 and 35 years | The greater Seattle | Quantitative (self-reported questionnaire) | |
| Vivancos et al. (2013) | To quantify the effectiveness of school-based sexual education on risky sexual behaviour and STI acquisition in adulthood | n = 711 between 18 and 29 years | University students | Quantitative (online survey) | |
| Vivancos et al. (2013) | To quantify the effectiveness of school-based sexual education on risky sexual behaviour and STI acquisition in adulthood | n = 711 between 18 and 29 years | University students | Quantitative (online survey) | |

(Continued)
| Author            | Focus of research                                                                 | Age cohort and sample composition | Area/context                        | Method                                      | Framework                  |
|-------------------|-------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------|---------------------------------------------|----------------------------|
| Walsh et al. (2014) | Testing a model specifying that traumatic intrusions after early abuse may increase risk for alcohol problems, which may increase the likelihood of engaging in RSB | 1,169 racially diverse college students with a mean age of 20.7 years | Large, public, urban southeastern university | Quantitative (questionnaires) |                           |
| Voisin et al. (2013) | Examined associations among multiple theoretically informed risk and protective factors on unsafe sex | African-American aged 15–21, were not married, currently pregnant or attempting to get pregnant | Three comparable STI clinics in Atlanta, Georgia | Quantitative (generalised estimating equation models) | Ecological Model |
| Wetherill et al. (2010) | Tested the influence of sexual values and perceived awareness and caring, or beliefs about how much parents and peers know and care about student’s behaviour on sexual behaviour | N = 1,928 between 17 and 19 years old | United states (high school and college) | Internet-based surveys | None |
| Wayment and Aronson (2002) | A path model tested in order to assess specific hypothesised predictors of risky sexual behaviour | n = 95 sexually active white female college students aged between 18 and 30 years | University in the southwestern US | Quantitative (questionnaire) | Health belief model |
one study was a mixed-method study that utilised regression analysis for data analysis (Townshend et al., 2014). Four reviews were conducted, three being literature reviews (Cooper, 2002, 2006) and one a systematic review (Marston & King, 2006).

3.2.3.5. Theory. In total, 10 of the 21 studies used a theoretical framework to guide their study. Theories comprised of Ecological Systems Theory (Kogan et al., 2010; Voisin et al., 2013) and Myotopia Theory (Brown & Vanable, 2007; Cooper, 2002). Other theories included Message Interpretation Model (Radanielina-Hita, 2015), Health Belief Model (Wayment & Aronson, 2002) and The Theory of Interpersonal Behavior (Table 5) (Sonmez et al., 2006).

4. Discussion
While the relationship between alcohol use and risky sexual behaviour is well-established in the literature (see Adams et al., 2014; Campbell et al., 2002; Fritz et al., 2002; Mbulaitseye et al., 2000; Weiser et al., 2006), there are few empirical studies that demonstrate and unpack the nature of this relationship (see Cook & Clark, 2005; Morojele et al., 2006; Muchimba, Haberstick, Corley, & McQueen, 2013; Scott-Sheldon et al., 2012). Research shows that young adults engage in heavy drinking and experience a range of alcohol-related problems, including poor class attendance, hangovers and trouble with authorities, injuries and even fatalities (Foster et al., 2013; Hingson, 2010; Hingson et al., 2005; Wechsler, Davenport, Dowdall, & Moeykens, 1994; Wechsler, Lee, Kuo, & Lee, 2000). The aim of the systematic review is to review and synthesise previous literature to discuss factors identified in the literature that influence the relationship between alcohol use and risky sexual behaviour. Thus, the articles in the current systematic review focused on literature highlighting these factors. The key factors influencing the relationship between alcohol use and risky sexual behaviour that emerged from the review were personality influences, social determinants and interpersonal factors. Yet, determining alcohol's precise role in sexual risk taking has proven to be difficult. Past research has produced mixed results, depending on characteristics of individuals, their partners and the situation, as well as how the link between alcohol use and sexual behaviour was assessed (Abby et al., 2007).

Patrick and Maggs (2010) suggested that the links between motivations for alcohol use and sexual behaviours are not well understood. However, within the literature the contributing factors for each overlap significantly, strengthening the relationship between the two concepts. While personality influences such as self-efficacy, self-regulation, self-awareness, sensation-seeking and so forth are important to understanding and determining drinking patterns, it has been suggested that dosage is an important aspect of alcohol use which is largely under the individuals’ control. However, there is evidence that frequency of drinking occasions may be greatly influenced by social factors (Vogel-Sprott, 1974). For example, university or college students with high levels of sensation seeking may be at especially high risk to begin or escalate heavy drinking. However, articles reviewed to a large extent employed a cross-sectional research design, thus making it impossible to examine changes over time and, therefore, difficult to draw solid conclusions. The major implication for the studies that utilised longitudinal designs is the age periods at which data was collected. Collecting data before adolescence and then after does not make allowance for the period in between. Future longitudinal examination of the aetiology of alcohol use will allow for better understanding of the window of influence for specific risk and protective factors (Rutledge & Sher, 2001), and using multilevel modelling approaches would allow researchers to evaluate several predictors at once in order to determine their individual and combined effects (Kraemer et al., 2001).

Studies exploring the social, contextual and environmental factors conducted research on very similar populations, namely college students or university students predominantly from First World countries (the US, New Zealand and Australia). While only 4 out of 20 studies under this theme focused on developing countries (South Africa and Kenya). Therefore, the above results may be limited to the specific context of North American, New Zealand and Australian young adults’ patterns of risky behaviour. Literature reviewed found that social norms, social context and social
beliefs, as well as the broader environment, contribute to alcohol use and risky sexual behaviour. Thus, studies from other countries are needed in order to acquire knowledge on the significance of the cultural influences of drinking motives.

Literature reviewed focusing on factors relating interpersonal aspects concentrated on how the individual interacts with various other parts of their lives such as the personal attributes (age, race, gender, biological make up and religiosity), family, peers, romantic relationships, and broader risk and protective factors. The studies additionally highlight the impact of one’s sociopolitical and historical situation shape decisions or lifestyles today (Cooper, 2006). Cooper (2006) further states that the belief that alcohol causally disinhibits sexual behaviour is firmly ingrained in our culture. Most people believe that drinking increases the likelihood of sexual activity, enhances sexual experience, and promotes riskier sexual behaviour (Cooper, 2006). Countries with an oppressive history have been shown to have a negative impact on an individual’s healthy self-development, and more broadly on the development of the environment in which the individual resides. This is evident in studies conducted in South Africa (Adams et al., 2014; Townshend et al., 2014) and the US (amongst various ethnicities such as African-Americans, Hispanic and Asians) (Brown & Vanable, 2007; Kogan et al., 2010; Langer et al., 2001; Park & Grant, 2005; Voisin et al., 2013). This is consistent with previous research that states that while there is evidence that there is an inverse relationship between risky behaviours and age (Ajayi, Marangu, Miller, & Paxman, 1991; Akwara, Madise, & Hinde, 2003; Chassin, Pitts, & Prost, 2002; Johnston, O’Malley, Bachman, & Schulenberg, 2004; Kiragu & Zabin, 1995; O’Neill, Parra, & Sher, 2001; Ochollo-Ayayo & Schwarz, 1991; Schulenberg, O’Malley, Bachman, Wadsworth, & Johnston, 1996), it is an unlikely outcome in communities characterised by poverty and lack of resources and access to educational and employment opportunities. These factors, with a historical and political genesis, are mutually influencing, resulting in a recurring process of risky behaviour and impoverishment. Along with these external factors, individual factors such as perceptions of self-identity, social identity, self-efficacy, sense of belonging and hope for the future play a significant role in contributing towards risky behaviours (Adams et al., 2014).

Despite the large body of theory and research that supports alcohol’s role in risky sexual behaviour, understanding the nature of this relationship has been more challenging than originally anticipated (for reviews, see Cooper, 2002; Halpern-Felsher, Millstein, & Ellen, 1996; Weinhardt & Carey, 2000). A possible contributing factor is that there were very few studies which utilised theoretical frameworks to structure the studies. The theoretical frameworks utilised attempted to summarise and make sense of individual and social factors contributing to alcohol use and risky sexual behaviour. These frameworks were used to understand the behaviour and help account for underlying mechanisms of the specific cohort’s drinking and may ultimately explain points for more comprehensive intervention development and enhancement. Essentially, there is no one theory to explain the relationship between alcohol use and risky sexual behaviour. However, for an intervention to be successful a theory is needed to explain the relationship, understand the contributing factors and the patterns in the relationship and how it changes. Additionally, the use of theoretically based questionnaires with well-defined items is particularly important since the diversity of content of research in this field restricts the comparability of findings and makes conclusions difficult (Kuntsche, Knibbe, Gmel, & Engels, 2005).

According to Kuntsche et al. (2005), an explanation for these inconsistent results could be that motives affect drinking only in the onset phase and not the continuation to drink and indulge in risky sexual behaviour. From the research reviewed, there is consensus that internally caused motives such as coping, sense of belonging and self-efficacy are strongly related with personality traits are more consistently related to alcohol use across drinking situations. However, since there is a lack of longitudinal evidence it is nearly impossible to determine the long-term effects of different drinking motives on different alcohol-related outcomes in different age groups within different contexts (Kuntsche et al., 2005).
4.1. Conclusions and Recommendations

Whilst there has been an increase in research attempting to ascertain and determine the key factors that make the relationship between the alcohol use and risky sexual behaviour significant, very few studies focused directly on the factors mediating and moderating this relationship. In spite of this, the studies and reviews which form part of this systematic review provide key insights into factors impacting on alcohol use and risky sexual behaviour. Further systematic enquiry and qualitative exploration at a primary level will allow for an increased comprehension as to how these factors contribute specifically to the relationship between alcohol use and risky sexual behaviour as some young adults may engage in risky sexual behaviour but not necessarily engage in alcohol use, or vice versa. Many of these studies reviewed were also quantitative studies; thus, an in-depth understanding, across time, will allow for a greater understanding of these factors. As Cooper (2006) expressed, the relationship between alcohol use and risky sexual behaviour is complex and cannot be explained by a single mechanism, but instead reflects multiple underlying causal and non-causal processes. Moreover, even the causal portion of this relationship is not apparent as a main effect but as an interaction. Therefore, there is a need to qualitatively explore young people’s understandings, perceptions and motivations to engaging in alcohol use and risky sexual behaviour. While these findings will be context-specific, this will be the foundation for studies that aim to quantitatively understand this relationship. Furthermore, there remains a need for research among young adults as a whole and not exclusively among young adults in school, colleges, university or clinic/treatment setting. Other gaps in the literature point to the need for research across diverse socio-economic group.

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