

**Exploring the Role of Context in Young Adults' Drinking Motives.**

by

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## Table of Contents

Acknowledgements .....	iv
Abstract .....	ix
Chapter One: Alcohol Use in Young People – Motives Matter .....	1
1.1 Thesis Overview .....	1
1.2 Alcohol Use and Associated Harms .....	2
1.2.1 Risky drinking.....	4
1.3 Understanding Alcohol Use in Young People.....	4
1.3.1 Motivational theory – Defining terms.....	6
1.3.2 Cox and Klinger’s motivational model of alcohol use. ....	8
1.4 Summary.....	13
Chapter Two: Systematic Review of Literature relating to Young People’s Drinking Motives.....	14
2.1 Method.....	15
2.2 Results and Discussion .....	17
2.2.1 The conceptualisation and measurement of drinking motives.....	17
2.2.2 Relationships between drinking motives, alcohol use and alcohol-related harm. ....	29
2.3 Summary and Conclusion.....	47
Chapter Three – Situated Drinking Motives .....	51
3.1 Alcohol Use is Context-Specific .....	53
3.2 The Uncertain role of Drinking Motives in Context-Specific Alcohol Use....	55
3.3 The Case for Situated Drinking Motives .....	57
3.3.1 Evidence from empirical studies.....	58
3.3.2 Evidence arising from theory.....	65
3.4 Summary.....	71

3.5 The Current Research Thesis.....	73
Chapter Four: Identification of Meaningfully Different Drinking Contexts.....	74
4.1 Study One – Qualitative Examination of Meaningful Drinking Contexts .....	74
4.1.1 Method. ....	75
4.1.2 Analysis and discussion. ....	77
4.1.3 Summary and Conclusion. ....	91
Chapter Five: Confirming the Context Specificity of Drinking Motives.....	93
5.1 Review: Two Potential Models Explaining Drinking Motives .....	93
5.2 The Current Research Gap.....	94
5.3 Current Study: Assessing Context-Specificity in Young People’s Drinking Motives.....	95
5.3.1 Method. ....	96
5.3.2 Procedure. ....	98
5.3.3 Results.....	100
5.3.4 Discussion and conclusion.....	108
Chapter Six: Examining the Utility of Context Specific Drinking Motives .....	115
6.1 The Potential Role of Three Contexts in Motivated Drinking .....	116
6.1.1 Drinking at home alone.....	117
6.1.2 Drinking at a party with friends.....	118
6.1.3 Drinking at a multi-generational event. ....	119
6.2 The Role of Individual Differences .....	120
6.2.1 Generalised anxiety.....	121
6.2.2 Reward sensitivity and punishment sensitivity.....	122
6.3 Study Three: Assessing the Utility of Context-Specific Drinking Motives - Refining our Understanding of Young People’s Drinking.....	123
6.3.1 Method. ....	125

6.3.2 Results.....	137
6.3.3 Discussion.....	147
6.4 Conclusion.....	163
Chapter Seven: Summary and Conclusion.....	164
7.1 The Nature of Drinking Motivations.....	164
7.1.1 Motives have state- and trait-like properties.....	165
7.1.2 If...then... motivational signatures.....	167
7.2 Utility of Context Specific Drinking Motives.....	169
7.2.1 Motivated Drinking Pathways.....	169
7.2.2 ‘Unmotivated’ drinking pathways.....	174
7.2.3 Reviewing the role of context.....	175
7.2.4 Summary.....	176
7.3 Limitations and Future Research.....	178
7.4 Conclusion.....	180
References.....	181
Appendix A. Summary of Studies Comprising the Systematic Review.....	209

**List of Tables**

Table 2.1 .....	22
Table 5.1 .....	102
Table 5.2 .....	104
Table 5.3 .....	105
Table 5.4 .....	106
Table 5.5 .....	107
Table 6.1 .....	137
Table 6.2 .....	137
Table 6.3 .....	139
Table 6.4 .....	142
Table 6.5 .....	146
Table A1 .....	209
Table A2 .....	210
Table A3 .....	212
Table A4 .....	240
Table A5 .....	246

**List of Figures**

Figure 1.1 .....	11
Figure 2.1 .....	17
Figure 5.1 .....	100
Figure 6.1 .....	131
Figure 6.2 .....	133
Figure 6.3 .....	136

### **Abstract**

This research makes a unique contribution to the existing literature, by arguing that young people's drinking motives are most effectively conceptualised as context-specific, rather than completely stable and trait-like in nature. The validity and utility of this proposition was demonstrated via a comprehensive review of past empirical and theoretical evidence, and by the findings of three unique empirical studies. Three distinct drinking contexts for drinking (i.e., at home alone; at a party with peers; at a multigenerational event) were identified via a qualitative analysis of interviews provided by 10 university student drinkers. These three context variables were further explored in two studies that employed confirmatory factor analysis and multi-level linear modelling techniques to examine the drinking motives, alcohol-related behaviours, and personality traits of 422 university student drinkers. In all three studies, evidence was presented in support of the view that drinking motives have both trait- and state-like properties, and are most usefully measured and conceptualised as context-specific. Young adults were found to drink for different reasons from one person to the next (i.e., trait-like), and from one situation to the next (i.e., state-like). Furthermore, consistent with social cognitive theory, evidence was found that individuals possess somewhat unique patterns of *context-motive* associations, that can, in some cases, be explained by personality variables such as trait-anxiety. Findings suggest that the precision with which researchers understand motivational pathways to alcohol use and related harm may be greatly improved by adopting a context-specific conceptualisation of drinking motives. Limitations and implications of these findings were also outlined.

## **Chapter One: Alcohol Use in Young People – Motives Matter**

### **1.1 Thesis Overview**

Excessive alcohol use is common in Australia, as in most other western societies, and is considered by peak health bodies to contribute to a range of personal and societal harms, including exposure to illness, accidents, injury and violence (Australian Institute of Health and Welfare, 2010; Australian Medical Association, 2009; World Health Organisation, 2009, 2011). Consequently, great value exists in understanding how and why people drink; especially adolescents and young adults, for whom risky alcohol use and associated harms appear to be disproportionately high (Australian Institute of Health and Welfare, 2008).

This thesis adds to the extensive body of literature that uses drinking motives—the categories of reasons why people drink—as a way of understanding alcohol use and related consequences in young people. In particular, the current research adds a unique contribution to the existing literature by examining the *context-specific* nature of drinking motives. That is, the extent to which individuals' reasons for drinking differ systematically from one situation to the next. By conceptualising motives as context dependent, it is argued that more can be learned about the mechanisms underlying patterns of problematic drinking behaviour and consequences, than is known currently. The current thesis adopted two broad aims: (i) to assess whether the self-reported drinking motives of young adults operate in context-specific ways, and if so (ii) to assess the utility of this new conceptualisation by exploring how context-specific measures of drinking motives relate to various drinking outcomes and personality variables.

In this introductory chapter, the problems associated with alcohol use in young people (aged 14-29 years) are briefly explored, and past efforts to understand alcohol use in this population summarised. Specific attention is then given to motivational

theory as a way of understanding alcohol use. This is achieved through a consideration of interrelated motivational constructs, and of the dominant theoretical model: Cox and Klinger's Motivational Model of Alcohol Use (1988, 2004b; Cox, Klinger, & Fadardi, 2006). Chapter two consists of a systematic review of the literature relating to drinking motives in young people, undertaken to update an existing review (Kuntsche, Knibbe, Gmel, & Engels, 2005, 2006d). The specific aims were to: (i) assess how motives have been measured and (ii) evaluate the evidence characterising the relationships between motives, alcohol use and alcohol-related harm. In chapter three, based on a critique of existing findings and a social cognitive framework, it is argued that drinking motives may be most effectively conceptualised and assessed as in relation to particular situations or contexts. These proposals are empirically tested across three studies reported in chapters four, five and six.

Specifically, chapter four reports the findings of study one, a qualitative study designed to explore and identify a number of meaningfully different contexts in which the drinking motives of individuals may be reasonably expected to differ. Studies two and three (chapters five and six) report on a quantitative analysis of data from an online survey of 442 young adults' context-specific drinking motives and various other alcohol-related variables. In study two, a context-specific model of drinking motives is compared with a trait-like one, using a variety of analytic strategies including confirmatory factor analysis. Using additional data from the same sample of 442 young adults, study three explores the utility of a context-specific model of drinking motives, and seeks to understand the role of personality in influencing context-specific patterns of drinking motivation and behaviour.

## **1.2 Alcohol Use and Associated Harms**

Alcohol consumption is common in young adults, with nearly half of all Australians aged 20-29 years drinking alcohol on a weekly basis (Australian Institute of

Health and Welfare, 2008). Furthermore, around 80 percent of the alcohol consumed within this age group is done so at levels that significantly elevate the drinker's risk of sustaining acute harm (Chikritzhs et al., 2003). Statistics worldwide reflect a similar picture (World Health Organisation, 2011). Alcohol consumption is considered normative in many western cultures, however public concern has been raised over the significant and well established adverse consequences associated with excessive drinking (Blake, 2010; International Center for Alcohol Policies, 2011a; World Health Organisation, 2011).

Alcohol, especially when consumed in episodes of heavy (i.e., typically defined as more than 5 drinks on one occasion; Rehm, Shield, Rehm, Gmel, & Frick, 2012), is thought to directly influence injury (both intentional and non-intentional) and disease via three main mechanisms: 1) toxic effect of alcohol on tissues and organs, 2) effects resulting from intoxication, and 3) dependence (Rehm et al., 2003). Indeed, a recent report of the global status of alcohol and health by the World Health Organisation (2011) found alcohol to be the eighth highest risk factor for death and the third most important risk factor for disease and disability world-wide. The WHO report found alcohol to be causally linked to eight categories of injury and disease: 1) *neuropsychiatric disorders*—including alcohol use disorder, epilepsy and depression; 2) *gastrointestinal diseases*—of which liver cirrhosis and pancreatitis are common; 3) *cancer*—including breast, larynx, colorectal, liver and others; 4) *intentional injuries*—such as suicide, self-injury and violence; 5) *unintentional injuries*—including road traffic accidents, drowning and poisoning; 6) *cardiovascular diseases*—e.g., ischemic heart disease, stroke and hypertension; 7) *foetal alcohol syndrome and pre-term birth complications*, and 8) *diabetes mellitus*.

More broadly, heavy alcohol use is also linked with a number of harmful social consequences. These include reductions in workplace productivity (Gmel & Rehm,

2003); interference with inter-personal relationships (Room et al., 2002), increased involvement of health, social and legal services, as well as a range of negative impacts experienced by victims of alcohol-related crime and accidents (Laslett et al., 2010). Understandably, these physical, psychological and social problems associated with alcohol use and abuse pose a significant threat to the wellbeing of individuals, families and communities (World Health Organisation, 2011).

**1.2.1 Risky drinking.** The risks associated with alcohol use are greater when alcohol is consumed in heavy episodes, however little consistency exists within the literature over precisely what constitutes ‘risky drinking’ (International Center for Alcohol Policies, 2011a; World Health Organisation, 2011). Drinking more than 5 alcoholic drinks on any occasion appears to be the most commonly adopted critical value by researchers (as evidenced by the review of 90 recent papers in chapter two), however the duration of a ‘drinking occasion’, as well as the size and strength of each drink varies greatly across studies and countries (International Center for Alcohol Policies, 2011a). In Australia, the National Health and Medical Research Council’s (2009) guidelines recommend that, those over 18 years of age drink no more than four standard drinks (40 grams of pure alcohol) a day, while those under 18 are advised to abstain from drinking altogether, to avoid significantly increasing their risk of alcohol-related harm arising from that drinking occasion.

### **1.3 Understanding Alcohol Use in Young People**

This thesis focuses on alcohol use in young people (aged 10-25 years), for whom excessive alcohol use presents a particular concern (International Center for Alcohol Policies, 2011b). Data from the 2007 National Drug Strategy Household Survey indicate that risky drinking peaks in early adulthood (Australian Institute of Health and Welfare, 2008). Furthermore, adolescence and young adulthood represents a period where tolerance to the effects of alcohol is generally low, and risk taking behaviours are

particularly high (National Health and Medical Research Council, 2009). Indeed, alcohol use contributes to the three leading causes of death amongst adolescents—unintentional injuries, homicide and suicide (J. W. Miller, Naimi, Brewer, & Jones, 2007). Also of concern, is the increased risky sexual behaviour associated with alcohol use within young people (Coleman & Cater, 2005b). There is also some evidence to suggest that drinking alcohol at a young age, when the brain is still developing, can contribute to future learning problems and poor mental health (National Health and Medical Research Council, 2009).

Clearly, given the extent and nature of the problem, great potential benefit exists in understanding why and how young people drink alcohol, as such knowledge can usefully inform prevention / intervention strategies. A number of different research disciplines have contributed to this understanding. Biochemistry, physiology and pharmacology have brought an understanding of many metabolic and physical mechanisms associated with alcohol use (e.g., Hunt, 1990a, 1990b), while research from a sociological, anthropological and social psychological perspective has demonstrated the importance of norms and other social and cultural factors in influencing drinking behaviour (e.g., Heath, 1990). Further, the field of psychology has also added to this body of knowledge, through investigation into dimensions such as personality, learning, cognition and affect (Leonard & Blane, 1999). Indeed, a wide range of psychological theories of alcohol use are described within the drinking literature, many of which contain somewhat overlapping constructs and processes.

*Learning theories* of behaviour, including classical and operant conditioning, hold that drinking can be understood by the rewards (e.g., stress reduction, or feeling high) and punishments (e.g., hangovers or injuries) that accompany alcohol use (Carver, Harrison, Addiction, & Health, 2004). Other theoretical perspectives, such as Albert Bandura's *Social Learning Theory* (1977) and *Social Cognitive Theory* (1986) recognise

the important role cognitions, as well as the social environment, play in shaping each individuals' unique perception of reward and punishment.

The present paper focuses attention on a particularly promising and influential area of psychological research; *drinking motives*. Arising from a social-cognitive approach, drinking motives represent a distinct theoretical construct that is thought to represent a proximal determinants of drinking behaviour (M. L. Cooper, 1994; Cox & Klinger, 1988, 2004b). Drinking motives and have been found to strongly and independently associate with measures of alcohol use and associated harm (see review by Kuntsche et al., 2005). Additionally, psychosocial interventions that target drinking motives, such as motivational interviewing (W R Miller & Rollnick, 2002) and relapse prevention (Marlatt & Gordon, 1985), have demonstrated good clinical utility (review by Proude, Lopatko, Lintzeris, & Haber, 2009), highlighting the potential value in better understanding what motivates people to drink.

**1.3.1 Motivational theory – Defining terms.** Perhaps unsurprisingly given the intuitive and logical appeal, asking individuals why they drink has proven both a popular and productive way for researchers to understand the processes underlying drinking behaviour (Kuntsche et al., 2005). *Drinking motives* relate closely to a number of cognitive constructs, including reasons, goals, drives, needs, expectancies, volition, intention, affect and context, and have been conceptualised and operationalised in various ways by researchers. In this section, consideration is given to these definitional matters.

Although no single definition of drinking motive (or motivation) is universally accepted, the present paper adopts a slightly modified version of Kuntsche, Knibbe, Gmel and Engels' (2005) description of a *drinking motive* as “conscious or unconscious [class of] reasons for [drinking]... that directs a person's energies towards a goal” (p 845, with modifications in parentheses). Interestingly, the term *reason* has traditionally

been used interchangeably with *motive*, however Kuntsche et al. (2005) argue that *reason* more accurately describe thought processes that are rational and consciously derived whereas *motives* can be either conscious or unconscious. Additionally, drinking motives tend to refer to broad classes of reasons to drink, such as ‘to cope’, or ‘for social enhancement’, whereas reasons for drinking are typically individualised and specific—for example, ‘drinking to get to sleep’ or to ‘aid conversation’ (e.g., Comasco, Berglund, Orelund, & Nilsson, 2010). Critical to the current definition of motives is the notion that they relate to the pursuit of a *goal*—a desired outcome—for example to meet people, or to reduce stress.

Early motivational researchers such as Hull (1943) and Bindra (1968) used the term *drive* to describe an aroused internal state (e.g., hunger, thirst, sexual arousal) capable of modifying the subjective value of related incentives (e.g., food, drink and the opposite sex). Similarly, the concept of *need* has been used to describe the value an individual typically places on a class of incentives. For example, an individual with a high need for achievement places greater value on achievement related incentives such as winning sport and passing tests, than someone with low need for achievement (McClelland, 1976). Drives and needs can thus be considered important in determining the value of incentives (potential goals), and in this way contribute to the overall motivation an individual experiences (Cox & Klinger, 2004b).

Behavioural intentions—as outlined in the theory of reasoned action (Fishbein & Ajzen, 1975) and theory of planned behaviour (Ajzen, 1985)—refer to individuals’ immediate readiness to act—in this case, to consume alcohol. While drinking intentions and motives are conceptually similar in that they both represent proximal determinants of alcohol use, intentions can be thought of behavioural plans directed towards attaining valued goals (Ajzen, 1996), whereas motives more accurately reflect the reasons underlying these behavioural plans. Another construct closely linked with motivation is

affect—an emotional state, influencing almost all of an individual's psychological and biological processes (Klinger & Cox, 2004). A potential evolutionary advantage exists in linking affect with motivation, such that aversive outcomes can be avoided, and pleasurable ones sought out (Klinger, 1998).

Finally, and of particular relevance to the present research, drinking *context* and drinking *motives* have been considered somewhat equivalent by some researchers (e.g., T. O'Hare, 2001; Thombs & Beck, 1994)—based on an implicit understanding that reasons for drinking are inextricably tied with the nature of the drinking situation. Indeed, Kuntsche and colleagues (2005), in their review of drinking motives (see also chapter two), identified a number of measures of drinking context that, upon closer inspection, could equally be considered measures of drinking motives. Examples include the Drinking Context Scale (T O'Hare, 1997; T. O'Hare, 2001) that identifies three factors—convivial drinking, private intimate drinking and negative coping—and the Social Context of Drinking Scale (Thombs & Beck, 1994; Thombs, Beck, & Pleace, 1993) consisting of five subfactors—social facilitation, school-defiance, stress control, peer acceptance and parental control.

**1.3.2 Cox and Klinger's motivational model of alcohol use.** As illustrated above, a broad range of constructs contribute to understanding of motivation, and consequently, theories linking motivational processes to drinking must incorporate these disparate dimensions in a coherent and logical way. Perhaps the most influential theoretical work to emerge from the alcohol motivational literature comes from W. Miles Cox and Eric Klinger (Cox, Hosier, Crossley, Kendall, & Roberts, 2006; Cox & Klinger, 1987, 1988, 2004a, 2004b; Klinger & Cox, 2004). They describe a motivational model of alcohol use, that centres around the attainment of meaningful goals, and provides the framework for the majority of the contemporary alcohol motivational literature.

**1.3.2.1 *Selecting and pursuing goals.*** Klinger and Cox (2004) argue that individuals experience an ongoing process of committing to, pursuing, and eventually achieving or relinquishing meaningful goals. Couched in behaviourism, they outline a process whereby individuals select goals based on a combination of a) how much they value the incentive in question, and b) how likely they perceive its attainment. Klinger and Cox (2004) posit that goals (like behaviours) can be approach or avoidance orientated. That is, an individual may pursue a goal to avoid a particular aversive outcome, or alternatively, may select a goal directed towards the achievement of a pleasant outcome. Irrespective of the nature of the goal, once committed to, goals act as incentives that motivate behaviours via an expectation of desired affective change associated with achieving (or progressing towards) each goal (Klinger & Cox, 2004). Importantly, in their motivational model of alcohol use Cox and Klinger (1988, 2004b) suggest that drinking motivation can be categorised into different types based on the nature of the goals being pursued, and more generally, the unique patterns of antecedents and consequences present (M. L. Cooper, 1994). These are discussed below.

**1.3.2.2 *Determinants of drinking.*** Figure 1 (p. 11) below shows how the motivational model of alcohol use (proposed by Cox and Klinger, 1988, 1990) incorporates a number of biological, psychological and socio-cultural determinants of drinking into a unified motivational framework. The model holds that distal and more proximal factors are channelled, via various motivational pathways, towards a proximal decision to drink based on the expectation of desirable affective change. The most distal factors include an individual's: (a) biological reactions (both positive and negative) to alcohol, (b) personality characteristics, and (c) socio-cultural environment (including drinking norms and expectations). These factors are thought to reinforce patterns of cognitions and behaviours relating to drinking via the manipulation of incentive

structures. Consequently, an individual is thought to develop learned responses relating to the use of alcohol. As discussed briefly above, while extensive research into each of these areas exists, it falls largely outside the scope of the present thesis.

The motivational model also identifies a second group of determinants, more proximal in the decisional pathway, that contribute to an individual's motivation to drink (see Figure 1). These include the current positive and negative affect of the individual and the immediate drinking situation (i.e., factors such as the availability of alcohol, the degree to which the situation encourages/discourages drinking, and the quality and quantity of alternative incentives). Importantly, the inclusion of these factors, as determinants of drinking motivation (and subsequent behaviour), provides reason to expect that individuals' drinking motives may fluctuate to some degree from one situation to the next depending on the external (situational) and internal (emotional) context in which drinking takes place. For example, whilst at a party, an individual may be motivated to drink to reduce social anxiety (a desirable affective incentive) whereas the same individual may not be motivated to drink at all when they are at home alone, as the previous incentive is no longer present. This provides an initial theoretical rationale for believing that drinking motives may be context specific, which is expanded upon in chapter three below.

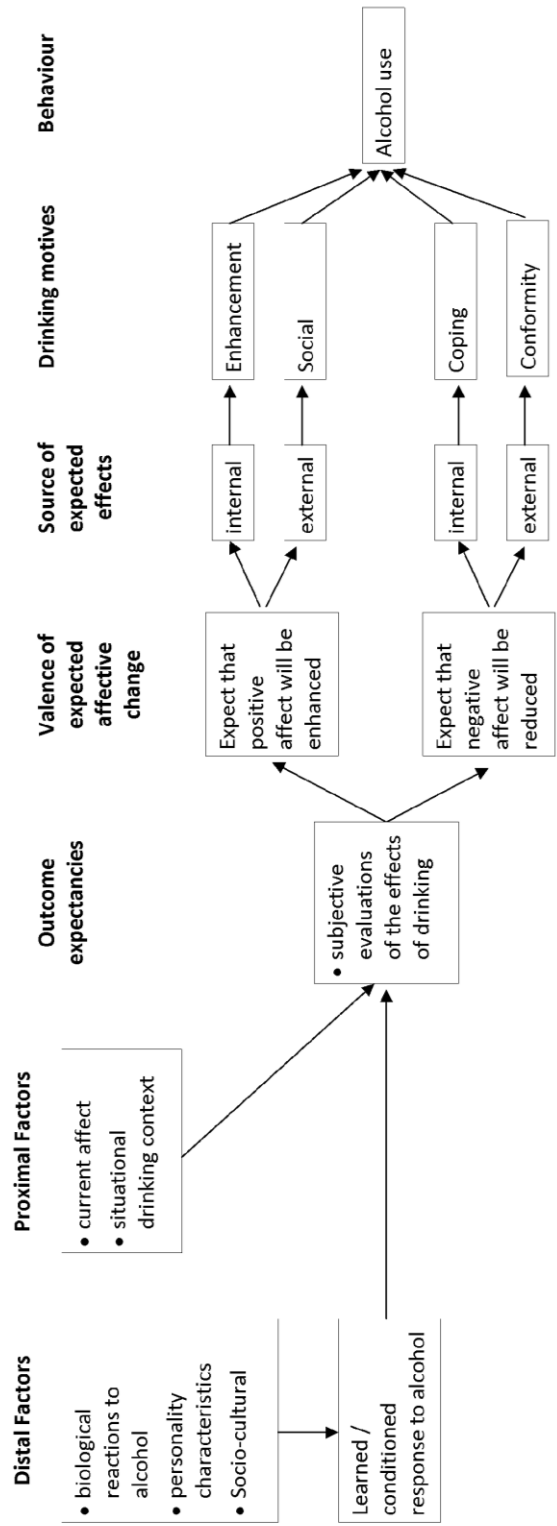


Figure 1.1. Determinants of alcohol use according to the motivational model (Cooper, 1994; Cox & Klinger, 1988, 1990, 2004).

Figure adapted from Kuntsche et al., 2005.

**1.3.2.3 Motive categories.** Cox and Klinger's (1988, 1990, 2004) motivational model holds that the combination of distal and proximal factors, outlined above, shape individuals' expectations of the effects of consuming alcohol in any given situation. These outcome expectancies in turn give rise to motives for drinking based on how well they align with each individual's valued goals, and can be expected to produce desirable affective change. According to the motivational model (Cox & Klinger, 1988, 2004b), four qualitatively distinct drinking motives are said to arise from this process—differentiated by the *valence* and *source* of the outcome the individual hopes to achieve by drinking. Regarding the valence of the expected outcome, an individual may be motivated to drink a) to increase positive affect, or b) to reduce negative affect (i.e., positive or negative valence, respectively). Regarding the source of the expected outcome, Cox and Klinger (1988, 2004b) differentiate between affective change that is a) directly caused by the pharmacological effects of alcohol, and b) caused instrumentally—through the indirect influence of drinking alcohol on external incentives (e.g., making friends, or performing a difficult task).

Using Cox and Klinger's motivational model as a foundation, Cooper (1994) simplified this distinction somewhat into internal (i.e., affect regulation) and external (i.e., social) sources of desired outcomes. By combining the two potential valences (positive, negative) with the two potential sources (internal, external), M. L. Cooper (1994) identified four distinct categories of drinking motives: (1) drinking to enhance positive mood or well-being (*enhancement*; positive, internal), (2) drinking to obtain social rewards (*social*; positive, external), (3) drinking to reduce negative emotions (*coping*; negative, internal), and (4) drinking to avoid social rejection (*conformity*; negative, external). As such, the proposed motives—enhancement, social, coping and conformity—represent four qualitatively distinct and theoretically derived dimensions with which to investigate alcohol use and related consequences.

Indeed, there is evidence that drinking motives are good cross-sectional predictors of alcohol use in young people, even when controlling for factors such as age and gender (Chalder, Elgar, & Bennett, 2006; Kuntsche, Knibbe, Gmel, & Engels, 2006c), outcome expectancies (Engels, Wiers, Lemmers, & Overbeek, 2005; Kuntsche, Knibbe, Engels, & Gmel, 2007b), type of alcohol consumed (Kuntsche, Knibbe, Gmel, & Engels, 2006a) and personality traits such as sensation seeking (M. L. Cooper, Frone, Russell, & Mudar, 1995; Urbán, Kökönyei, & Demetrovics, 2008). While Kuntsche et al. (2005, 2006d) provide a comprehensive review of the literature relating to the drinking motives of young people published between 1994 and 2004, no such review exists of the dozens of studies published since.

#### 1.4 Summary

Alcohol use plays a normative, but often problematic role in society (World Health Organisation, 2011), and particularly during adolescence and young adulthood, when alcohol is more likely to be consumed in a risky manner (Australian Institute of Health and Welfare, 2008; International Center for Alcohol Policies, 2011b). While many areas of research inform current understanding of alcohol, the thesis is focused on the role of *drinking motives* in particular, given the strength in which motives associate with alcohol use and related-harm, and due to their demonstrated utility as targets for intervention.

Based on work by Cox and Klinger (1988, 2004b), Cooper (1994) proposed a model of drinking motives that describes four discrete motives based on the *valence* (positive versus negative) and *source* (internal versus external) of the alcohol-related contingencies; *enhancement*, *social*, *coping* and *conformity*. While the study of drinking motives appears to be a useful way to understand and predict the drinking behaviour of young people (Kuntsche et al., 2005, 2006d), a more detailed and up to date review of past research is required given the large quantity of recent literature in this area.

## **Chapter Two: Systematic Review of Literature relating to Young People's Drinking Motives**

In chapter one, it was argued that drinking motives are a particularly useful way of understanding young people's drinking, as demonstrated by past findings of predictable associations with measures of alcohol use and related harm (Kuntsche et al., 2005, 2006d). The theoretical underpinnings of motivational research were explored, highlighting the dominant conceptualisation of drinking motives as proximal determinants of drinking behaviour through which more distal factors such as alcohol expectancies, social norms and personality traits are funnelled (Cox & Klinger, 1988, 2004b; Cox, Klinger, et al., 2006).

It was also argued that Cox and Klinger's foundational model (1988, 2004b) provides theoretical reason to expect that an individual's drinking motivation may differ depending on the particular context surrounding each drinking occasion. For example, in one situation (such as when at a party with friends) an individual may tend to be highly socially motivated to drink, whereas in another situation (such as a work function) social motivation may be low. While this context specific conceptualisation of drinking motives has the potential to greatly improve our understanding of young people's alcohol related behaviour (by revealing context-dependent relationships that are otherwise be obscured), the extent to which it is supported by past research is unclear due to the sheer volume of recently published studies.

Across two papers, Kuntsche and colleagues published a comprehensive review of the literature published between 1989 to 2004 relating to young people's drinking motives (Kuntsche et al., 2005, 2006d). Of particular relevance to this thesis, their systematic review summarises the way motives have been measured by researchers, and evaluates past evidence regarding the potential antecedents and consequences of drinking motives. However, a large number of potentially important studies have been

published since this initial review was completed—a preliminary search for ‘drinking motives’ in PsycINFO returns in excess of 300 subsequent papers—suggesting that an update is warranted. For the purposes of the current investigation into the role context plays in young people’s drinking motives, this chapter provides an update of the systematic literature review conducted by Kuntsche and colleagues, incorporating the findings of studies published subsequently (between the years of 2004 to 2013).

The present systematic review aims to build on the findings of Kuntsche et al. (2005) in evaluating (i) how drinking motives have been variously measured and conceptualised by researchers, and (ii) the nature of associations between drinking motives and important alcohol related outcomes such as alcohol use and exposure to harm. Additionally, given that the overarching goal of the thesis is to explore the notion of context-specific drinking motives, particular attention is directed to research exploring the role of contextual variables in drinking.

## 2.1 Method

For consistency, and given the peer reviewed and comprehensive methodology utilised by Kuntsche et al. (2005, 2006d) the present review adopted the same search terms and similar inclusion/exclusion criteria for the computer assisted literature search. Specifically, a search for keywords “*reason*” or “*reasons*” or *motive*” or “*motives*” or “*motivation*” and “*alcohol*” or “*drinking*” or “*drunk*” or “*drunkenness*” and “*adolescents*” or “*adolescence*” or “*juvenile*” or “*young people*” was conducted for English language articles. The inclusion range for the year of publication was 2004 onwards, and following databases were probed: *Academic Search Complete*, *ERIC*, *Medline*, *PsycEXTRA*, *Psychology and Behavioural Sciences Collection*, *PsycARTICLES* and *PsycINFO*.

As shown in Figure 2.1, the initial search identified 935 potentially relevant articles, that reduced to 589 after duplicate and non-English documents had been

removed. In keeping with the methodology adopted by Kuntsche et al. (2005, 2006d), abstracts were reviewed and any documents that were not studies (e.g., book chapters, reviews, comments, and errata) were excluded, as were studies that did not report findings regarding general reasons for drinking. For example, studies were excluded if they examined drinking motives for specific alcohol use— such as malt liquor or alcopops—or for alcohol abstinence, as were studies that only investigated drinking motives as a control variable for another variable of primary interest— such as alcohol expectancies.

The process of selecting studies for the current literature review is summarised in the flow chart below (Figure 2.1). Consistent with the methodology of Kuntsche et al. (2005, 2006d) only studies with a general sample of young people (10 to 25-year olds) were included in the review. A number of studies with university samples that were predominantly, but not exclusively, within this age range were deemed acceptable. Studies that investigated non-normal samples, such as people with alcohol use disorder, abuse histories, or homelessness, were excluded due to concerns that these findings may not generalise to the wider population of young people.

After abstracts had been reviewed, a total of 73 potentially relevant articles remained. The full articles for these papers were read, and the process of screening (based on the criteria outlined already) was repeated. During this process, a further 18 studies were excluded. The remaining articles were crosschecked and 35 relevant yet, up to this point, unidentified studies were included, bringing the total number of studies informing the present update to 90.

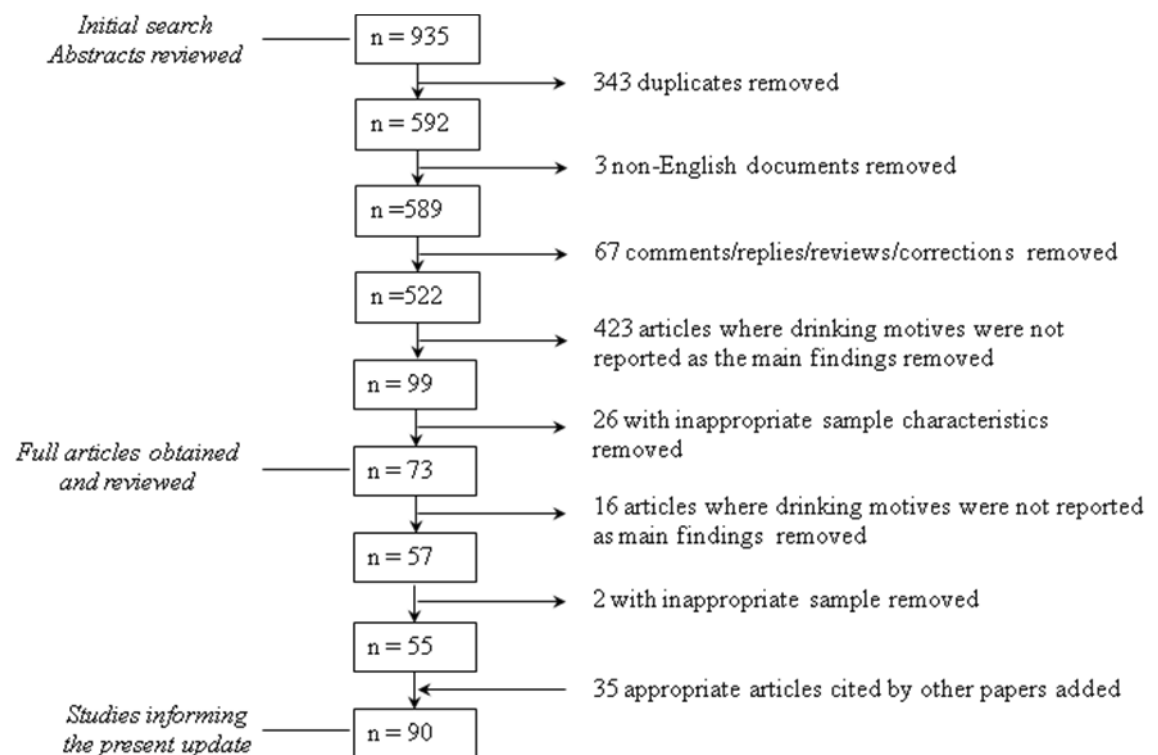


Figure 2.1. Flow diagram illustrating the selection process for the current updated review of literature.

## 2.2 Results and Discussion

Tables A1, A2, A3, A4 and A5 contained in Appendix A detail a comprehensive summary of the 90 studies that inform the present update of drinking motives in young people. These results are further summarised and discussed in answer to each of the two main research questions: (i) how have drinking motives have been variously measured and conceptualised within the literature?, and (ii) how do drinking motives relate to alcohol use, alcohol-related harm and other related variables? Throughout this chapter, the initial findings of Kuntsche et al. (2005, 2006d) are briefly described, followed by a summary of what is added to this understanding by studies published after 2004.

**2.2.1 The conceptualisation and measurement of drinking motives.** Kuntsche et al. (2005) noted great heterogeneity in the way drinking motives have been measured and conceptualised in the past, however the recent literature would indicate that consensus is forming over a preferred standardised measure; namely Cooper's Drinking

Motive Questionnaire –Revised (DMQ-R; 1994). Given the increasing popularity of the DMQ-R and related measures, special attention is given to understanding these measures, and the associated findings.

Consistent with Kuntsche et al. (2005) the review papers have been categorised according to the approach taken to the measurement of drinking reasons/motives. Four of the five categories are in keeping with those adopted by Kuntsche et al. (2005); (1) qualitative studies, (2) studies that measured individual reasons for drinking, (3) studies that used existing multi-factor motive measures, and (4) studies that developed new multi-factor motive measures—however one additional category was devised to accommodate a number of more recent studies that, (5) identified groups of motives based on a variety of within-person variables. It is valuable to consider the various ways motives have been measured and conceptualised within the past literature, as a way of assessing the existing empirical support for, and potential benefit of introducing, a context-specific understanding of how motives operate.

**2.2.1.1 Qualitative studies.** A minority of published studies employed qualitative techniques, typically asking young people a variety of open questions in order to elicit reasons why they drink. These reasons were then classified into meaningful categories, or motives, such as ‘*fun*’, ‘*to get drunk*’ or ‘*to relax*’. While Kuntsche et al. (2005) identified five studies that fell into this group, only a further three are added to this list from the recent pool of studies (Coleman & Cater, 2005a; Dodd, Glassman, Arthur, Webb, & Miller, 2010; Palmqvist, 2006; summarised in Table A1).

Interestingly, two of these studies concentrated on the phenomenon of binge drinking—excessive consumption on a single drinking occasion—and highlighted the importance of social factors, such as *peer influence*, and *social facilitation* in motivating this type of drinking (Coleman & Cater, 2005a; Dodd et al., 2010). Dodd and colleagues (2010) also identified a number of less commonly researched social reasons for

drinking—‘*to test one’s drinking limits*’ and as a ‘*rite of passage*’—in their study of 59 underage drinkers. A study by Palmqvist (2006) was somewhat unique in that it measured adolescents’ own reasons for drinking as well as their perceptions of others’ reasons for drinking, finding that while adolescents typically consume alcohol to *get drunk*, they believe others drink predominantly to *relieve stress*.

**2.2.1.2 Studies of individual drinking reasons.** In the initial review, Kuntsche et al. (2005) identified a second group of nine studies that asked participants to endorse one or more individual reasons for drinking (e.g., ‘*for curiosity*’, ‘*for enjoyment*’ and ‘*for the taste*’) that were **not** subsequently categorised into broader groups, or motives. A further four studies published since 2004 (summarised in Table A2), measured reasons for drinking in this way (Fraga, Sousa, Ramos, Dias, & Barros, 2011; Kuntsche & Gmel, 2006; Patrick & Schulenberg, 2011; Patrick, Schulenberg, O’Malley, Johnston, & Bachman, 2011)

All of these studies drew on data obtained as a part of population-based social research projects, including the Monitoring the Future study (Patrick & Schulenberg, 2011; Patrick, Schulenberg, et al., 2011), Health Behaviour in School-aged Children survey (Kuntsche & Gmel, 2006), and the EPITeen study in Portugal (Fraga et al., 2011)—affording researchers with a sizable sample, repeated measurement opportunities (in 3 of the 4 studies; Kuntsche & Gmel, 2006; Patrick & Schulenberg, 2011; Patrick, Schulenberg, et al., 2011), but perhaps limiting the choice of drinking motives/reasons measure used.

No information was provided regarding how response options (i.e., individual reasons for drinking) were devised/selected, however it is likely that this process was based on the opinions of researchers or samples of young people, rather than theoretical considerations. All studies asked participants to recall their reasons for drinking on past occasions (i.e., retrospectively), however the longitudinal nature of two studies (Patrick

& Schulenberg, 2011; Patrick, Schulenberg, et al., 2011) allowed the relationship between reasons for past drinking and future alcohol-use to be studied (discussed in more detail in section 2.2.2.5 below). Taken as a whole, the most commonly found reasons for drinking in early adolescence appear to be ‘*to relax*’, ‘*to celebrate*’, ‘*for the taste*’ and ‘*to experiment*’ while individuals seem to increasingly drink ‘*to relax*’ as they progress into early adulthood (Patrick & Schulenberg, 2011).

**2.2.1.3 Studies that used existing multi-factor motive measures.** The vast majority—71 percent of studies in the initial review (Kuntsche et al., 2005, 2006b) and 76 percent of those in the present update (Table A3)—measured drinking motives using existing multi-factor instruments. Of these, Cooper’s four-factor Drinking Motive Questionnaire – Revised (1994) and to a lesser extent the original three-factor Drinking Motive Questionnaire (DMQ; M. L. Cooper, Russell, Skinner, & Windle, 1992) have become increasingly predominant. Amongst recent studies (detailed in Table A3), an additional four studies used the short form (DMQ-R SF; Kuntsche & Kuntsche, 2009), and two studies used the modified five-factor version (Modified DMQ-R; V V Grant, Stewart, O’Connor, Blackwell, & Conrod, 2007) of the DMQ-R.

The DMQ-R was developed by Cooper (1994) and is theoretically derived from Cox and Klinger’s (1998) motivational model of alcohol use, which categorises drinking motivation into four discrete categories based on the *source* (internal vs external) and *valence* (positive vs negative) of the anticipated drinking outcomes (as described in section 1.3.2 previously). The 20-item DMQ-R assesses each of the four resulting motive dimensions with 5 items: *social* (e.g., ‘to be sociable’, ‘to celebrate a special occasion with friends’, ‘because it helps you enjoy a party), *enhancement* (e.g., ‘to get high’, ‘because it is exciting’), *coping* (e.g., ‘to forget your worries’, ‘to forget about your problems’), and *conformity* (e.g., ‘to be liked’, ‘so you won’t feel left out’).

Typically, respondents rate how often they drink alcohol for each of the 20 reasons on a scale ranging from 1 (*almost never/never*) to 5 (*almost always/always*).

Based on the theory underpinning the DMQ-R, researchers sometimes pair drinking motives according to their position on the two underlying dimensions (source and valence). For example, *coping* and *enhancement* motives have been jointly conceptualised as *internal* or *affect regulation* motives (Chalder et al., 2006; M. L. Cooper et al., 2008; Leigh & Neighbors, 2009; Neighbors, Larimer, Geisner, & Knee, 2004), *social* and *conformity* motives jointly as *external* or *social reinforcement* motives (Kuntsche, Knibbe, Gmel, & Engels, 2006b; Merrill & Read, 2010), *enhancement* and *social* motives jointly as *appetitive* or *positive reinforcement* motives (Armeli, Conner, Cullum, & Tennen, 2010; Ham, Zamboanga, Bacon, & Garcia, 2009), and *coping* and *conformity* motives jointly as *avoidance* or *negative reinforcement* motives (Ham et al., 2009; Hauck-Filho, Teixeira, & Cooper, 2012). These conceptualisations provide a useful way of summarising findings and in exploring the underlying mechanisms involved with drinking motives.

Consistent with the findings of Kuntsche et al. (2005), in recent studies the four drinking motives have been reliably endorsed by young people in the following order of frequency: social, enhancement, coping and conformity. As Table A3 demonstrates, recent studies have further confirmed the four factor structure of the DMQ-R across varying cultural groups including North American (e.g., M. L. Cooper et al., 2008; Kuntsche, Stewart, & Cooper, 2008), European (Crutzen, Knibbe, & Misyuk, 2010; Gmel, Labhart, Fallu, & Kuntsche, 2012; Urbán et al., 2008), South American (Hauck-Filho et al., 2012), Australian (Lyvers, Hasking, Hani, Rhodes, & Trew, 2010; Norberg, Norton, Olivier, & Zvolensky, 2010) and Thai populations (Siviroj, Peltzer, Pengpid, Yungyen, & Chaichana, 2012), generally displaying strong psychometric properties. Internal consistencies of all four scales are very good, consistently falling within a range

of .70 to .95. As Table 2.1 illustrates, all motive factors of the DMQ-R are inter-related, showing mean correlations of between .92 to .15 within the recent literature. The strong associations, particularly between social and enhancement motives, highlight the overlapping nature of drinking motives, and make it difficult to empirically disentangle these conceptually distinct motives.

Table 2.1

*Overview of correlations between DMQ-R motive dimensions according to the study in which they were reported (updated review studies only)*

	SOC and ENH	SOC and COP	SOC and CON	ENH and COP	ENH and CON	COP and CON
(Anderson, Grunwald, Bekman, Brown, & Grant, 2011)	.89	.65	.54	.67	.51	.59
(Arbeau, Kuiken, & Wild, 2011)	.61	.46	.55	.54	.36	.42
(Armeli, Todd, Conner, & Tennen, 2008)	.78					
(Blumenthal, Leen-Feldner, Frala, Badour, & Ham, 2010)	.69	.32	.49	.39	.47	.36
(Chalder et al., 2006)	.81	.68	.47	.61	.44	.60
(M. L. Cooper et al., 2008)	.80	.68	.51	.65	.50	.63
				.40-.60		
(Digdon & Landry, 2013)	.77	.50	.43	.47	.27	.25
(Goldsmith, Tran, Smith, & Howe, 2009)				.62		
(Ham et al., 2009)	.73	.46	.20	.47	.20	.42
	.78	.54	.22	.55	.22	.30
(Hauck-Filho et al., 2012)	.85	.40	.26	.43	.19	.22
(Hendershot et al., 2011)	.75	.51		.60		
(Kuntsche et al., 2007b)	.80	.54	.37	.59	.29	.45
(Kuntsche et al., 2006b)	.92	.59	.29		.37	
(Kuntsche & Stewart, 2009)	.80	.51	.36	.51	.25	.42
(Kuntsche, Wiers, Janssen, & Gmel, 2010)	.67	.52	.33	.48	.23	.32
(Lewis et al., 2008)	.72	.34	.30	.34	.10	.29
(Lewis, Phillippi, & Neighbors, 2007)	.55	.37	.30	.25	.09	.38
(Lyvers et al., 2010)	.66	.33	.33	.50	.24	.38
(Martens, Rocha, Martin, & Serrao, 2008)	.77	.41	.30	.32	.15	.44
(Mazzardis, Vieno, Kuntsche, & Santinello, 2010)	.83	.55	.48	.61	.41	.43
(Merrill & Read, 2010)	.61	.44	.32	.40	.21	.21
(Mohr et al., 2005)	.69	.50	.40	.44	.34	.56
(Neighbors et al., 2004)	.75	.49	.44	.43	.24	.51
(Norberg et al., 2010)	.73	.46	.58	.56	.41	.39
	.61	.32	.40	.30	.27	.36
(O'Connor & Colder, 2005)	.81	.61	.38	.58	.30	.40
	.83	.59	.33	.53	.22	.31
(C. L. Park, Armeli, & Tennen, 2004)	.76					
(S. H. Stewart, Morris, Mellings, & Komar, 2006)	.61				.17	
(Urbán et al., 2008)	.72	.59	.49	.56	.42	.43
(Van Tyne, Zamboanga, Ham, Olthuis, & Pole, 2012)	.63	.30		.27		
Mean correlation across studies	0.73	0.48	0.39	0.47	0.29	0.40

*Note.* SOC: social motive; ENH: enhancement motive; COP: coping motive; CON: conformity motive.

The original 15-item version of this measure, the Drinking Motive Questionnaire (M. L. Cooper et al., 1992), consists of slightly different items and measures only three motive dimensions; *social*, *enhancement* and *coping*—containing no items that clearly tap into conformity reasons for drinking. The proportion of studies using this original measure decreased from 12% pre-2004 (Kuntsche et al., 2005) to 8% of recent studies.

Of the recent studies, only a small number utilised existing multi-dimensional measures of motives not based on the DMQ. Single studies utilised the Reasons for Drinking Questionnaire (Cox, Hosier, et al., 2006), the Reason for Drinking Scale (LaBrie, Hummer, & Pedersen, 2007), the Desired Effects of Drinking Scale (DEoDS; Feldstein Ewing, Hendrickson, & Payne, 2008), and the Substance Use Coping Inventory (Piko, 2006). As Kuntsche and colleagues noted in their original review (2005), great variety exists in the way apparently similar motive dimensions are measured by each of these instruments. This diversity is discussed in greater detail below.

**2.2.1.4 Studies that developed new multi-dimensional drinking motive measures.** A fourth group of 10 studies, identified by Kuntsche et al. (2005) developed their own multi-factor drinking motives measure based on the similarities observed in participant endorsement of individual questionnaire items. These 10 different questionnaire-based measures contained a range of 10 to 40 items, and measured between 2 to 10 motive categories. While most measures were unnamed, two exceptions were the Reasons for Drinking Scale (RDS; Carpenter & Hasin, 1998) and the, somewhat confusingly, (almost) identically named Reason for Drinking Scale (RFD; Cronin, 1997)—not to be further confused with the (almost equally) identically named Reasons for Drinking Questionnaire (Farber, Khavari, & Douglass, 1980)!

From 2004 onwards, the rate of new instrument development did not abate, with a further 10 studies reporting the use of unique measures of drinking motives (Comasco et al., 2010; V V Grant et al., 2007; Graziano, Bina, Giannotta, & Ciairano, 2012; Kuntsche & Kuntsche, 2009; Kuntsche & Müller, 2011; Lindgren, Hendershot, Neighbors, Blayney, & Otto, 2011; Littlefield, Sher, & Wood, 2010; Mihic, Wells, Graham, Tremblay, & Demers, 2009; Novik, Howard, & Boekeloo, 2011; Ostafin & Marlatt, 2008; summarised in Table 2.4). Consistent with past research, all but two of these studies (Lindgren et al., 2011; Ostafin & Marlatt, 2008) used a self-report questionnaire format, consisting of between 5 and 28 items that were categorised into 2 to 5 motive groups.

Three of these were modifications of Cooper's (1994) DMQ-R. Kuntsche and Kuntsche (2009) developed a 12-item short form of the measure (DMQ-R SF), while Grant and colleagues (2007) published a five-factor Modified Drinking Motive Questionnaire-Revised (Modified DMQ-R) that differentiates between being motivated to drink to *cope with anxiety*, from drinking to *cope with depression*. A final study, by Kuntsche and Muller (2011) provided a modified version of the DMQ-R designed to measure the four common motives (*social, enhancement, coping and conformity*) for first-time alcohol use.

A further five studies introduced unnamed measures of drinking motives into the literature (Comasco et al., 2010; Graziano et al., 2012; Littlefield et al., 2010; Mihic et al., 2009; Novik et al., 2011). Comasco et al. (2010) developed a measure based on the content analysis of interviews of 19-year olds, while Novik et al. (2011) used exploratory factor analysis to categorise items based on a previous measure. Three research teams allowed aspects of the motivational theory of alcohol use (Cox & Klinger, 1988) to inform the development of their measure (Graziano et al., 2012; Littlefield et al., 2010; Mihic et al., 2009), however despite the similar conceptual

underpinnings to the DMQ-R, a number of unique motives were identified: *experimentation/transgression*—to overcome limits and break rules, and *self-affirmation*—to demonstrate adulthood and independence (Graziano et al., 2012); and *aesthetic* reasons—to enjoy the taste, or improve a meal (Mihic et al., 2009). Of significant relevance to the current research thesis, Mihic and colleagues measured drinking motives at a situational level (i.e., repeatedly, across a variety of drinking episodes). The findings and implications for the current research are discussed further in section 2.2.1.6, and chapter three, below.

Breaking from tradition, and drawing on research into *automatic mental processes* from the field of cognitive psychology, Lindgren et al. (2011), and Ostafin and Marlatt (2008) adopted a different approach to the measurement of drinking motives. Specifically, these researchers were concerned with the measurement of the implicit aspects of drinking motives—those that are unintentional, effortless, difficult to control, and not involving awareness—termed *automatic alcohol motivations* (Ostafin & Marlatt, 2008). Ostafin and Marlatt (2008) used the computer-administered Implicit Association Test (IAT) protocol, pioneered by Greenwald, McGhee and Schwartz (1998), to assess and compare the fluency of a person's cognitive associations between alcohol (vs non-alcohol) related visual cues, and the words 'approach' (vs 'avoid'). This comparison served as a measure one's *automatic alcohol motivation*. Extending this work, Lindgren et al. (2011) reported a further two IAT protocols that measured one's fluency of associations between alcohol-related cues with the words 'cope' (vs 'ignore'), and 'excite' (vs 'diminish'), as a measure of *coping* and *enhancement* related *automatic alcohol motivations*, respectively.

**2.2.1.5 Studies that identified classes of motivated drinkers.** A new category was developed to accommodate the four studies (Coffman, Patrick, Palen, Rhoades, & Ventura, 2007; Mackie, Conrod, Rijdsdijk, & Eley, 2011; Mun, von Eye, Bates, &

Vaschillo, 2008; Patrick & Maggs, 2010; summarised in Table 2.5) that did not fit neatly into any of the measurement categories described Kuntsche et al.'s original review (2005, 2006b). Each of these studies used a model-based statistical procedure called Latent Class (or Profile) Analysis to identify qualitatively distinct groups of motivated drinkers, based on each participant's pattern of stated reasons for drinking. Latent class analysis, a specific form of mixture modelling, is sensitive to the degree to which an individual may be motivated to drink across a variety of reasons. By analysing each individual's pattern of drinking motives (rather than only their most prominent one) more detailed and potentially meaningful differences between *types* of drinkers can be identified.

Three studies identified classes of drinkers based solely on individuals' profiles of drinking reasons (Coffman et al., 2007; Mackie et al., 2011; Patrick & Maggs, 2010). Coffman et al. (2007) differentiated between those who use alcohol to experiment (*experimenters*), to get high (*thrill-seekers*); to relax (*relaxers*), and for multiple reasons (*multi-reasoners*). Mackie et al. (2011) found that individuals could usefully be described as having either *family-orientated*, *social*, *enhancement/social*, or *coping/social* motive profiles, while Patrick and Maggs (2010) identified three classes of drinkers based on motives both for and against drinking (*low for / high against*; *average*; and, *high for / low against*). A fourth study, by Mun et al. (2008), used a variety of behavioural and emotional within-person variables in addition to drinking motives, to identify a *high alcohol risk*, and *normative* group. The findings of these four studies are further discussed in reference to drinking behaviours and outcomes in section 2.2.2.6 below. However, it is worthwhile highlighting two challenges in comparing the findings of these four studies. First, none of the four studies within this category based their class analyses on established measures of drinking motives (such as the DMQ-R) instead using a range of diverse measures. and second . Second, their

solutions often relied on idiosyncratic indicators (including biometric data, motives to abstain from drinking, and mood) which change the nature of the solution (i.e., the types of drinkers identified).

**2.2.1.6 State (situational) versus trait (generalised) drinking motives.** The vast majority of studies comprised in the present systematic review (98%) measured drinking motives/reasons in a way that did not allow for the detection of context specific variation. This is consistent with a trait-like conceptualisation of drinking motives—where drinking motives are seen as generalised traits (or individual-difference variables) that remain relatively stable across time and situations. Although a number of studies have considered long-term, developmental changes in drinking motives via the repeated measurement of motives over a period of months or years (Littlefield et al., 2010; Patrick & Schulenberg, 2011; Schelleman-Offermans, Kuntsche, & Knibbe, 2011), only two studies reviewed measured motives across multiple situations over a short timeframe (i.e., repeatedly, over a number of drinking episodes; Arbeau et al., 2011; Mihic et al., 2009). By measuring motives in this way, an indication of the extent to which drinking motives vary within-individuals (across situations) can be gained. Indeed, the finding by (Arbeau et al., 2011) that around one quarter and one third of the variation in daily enhancement and coping motives occurs within-individuals is consistent with the view that drinking motives are somewhat context-dependent. The findings of these two studies are examined in detail in chapter three—an evaluation of the evidence regarding a context-specific drinking motives.

**2.2.1.7 Summarising the multi-dimensional nature of drinking motives.** In comparing the many motive factors measured within the literature, Kuntsche et al. (2005) noted that the drinking motives construct could be adequately reduced to three inter-related factors: a) coping motives—to avoid or reduce unpleasant internal events (thoughts, feelings, sensations, urges), b) social motives—to gain/strengthen positive, or

avoid/reduce negative, social consequences, and c) enhancement motives—to gain or enhance positive internal events. In doing so, however, the authors acknowledged two significant caveats.

First, motive factors do not appear to be discrete, but rather are inter-related and overlapping to varying degrees. This view is supported by the current update of literature that finds typically high correlations, particularly between *enhancement* and *social* motives, *enhancement* and *coping* motives, and *social* and *coping* motives (Table 2.1). As such, difficulties arise in empirically disentangling these motives.

Second, a great heterogeneity was found to exist in the way, even conceptually similar motives, are measured by different instruments. Kuntsche et al. (2005) found frequent instances within the literature where a single item (e.g., ‘I drink to get high’) was subsumed by different motive scales (e.g., *enhancement* or *social*) depending on the instrument in question.

Similarly, in the current review, *coping*-related reasons for drinking contributed to scales of *coping* (e.g., Comasco et al., 2010; Graziano et al., 2012; Littlefield et al., 2010; Mihic et al., 2009) and *emotional distress* (Novik et al., 2011), however implicit measures were also utilised by some (Lindgren et al., 2011). Regarding the *social* factors, the items contributing to Mihic et al.’s (2009) *social* scale, and Novik et al.’s (2011) *social-ease* scale have high face validity, however, it can be noted that scales assessing all motive factors typically contain items that contain some social aspects (e.g., ‘to be able to enjoy myself with friends’ contributes to the *coping* subscale of Graziano et al., 2012). While some *social* scales contain items that appear on face value to be equally representative of other motive factors such as coping (e.g., ‘to feel relaxed’; Novik et al., 2011).

A number of studies identify combined *social-enhancement* (Comasco et al., 2010; Mackie et al., 2011), *social-coping* (Mackie et al., 2011) and *social/fun* (Patrick &

Maggs, 2010) groupings, which is perhaps a reflection of the inter-relatedness of these motive types (see also Table 2.6). A number of recently developed instruments also assess *drinking norm*-related aspects separate from other social drinking motives, via scales of *conformity*, *experimentation/transgression*, *self-affirmation* (Graziano et al., 2012), *social-image* (Novik et al., 2011), and *dominance* (Comasco et al., 2010). Similarly, *enhancement*-related reasons for drinking have been variously assessed via scales of *enhancement* (M. L. Cooper, 1994; Littlefield et al., 2010; Mihic et al., 2009), *enhancement-social* (Comasco et al., 2010), *aesthetic reasons* (e.g., 'to enjoy the taste' Mihic et al., 2009), and by implicit measures (Lindgren et al., 2011).

To reduce the inconsistency brought about by measurement differences, Kuntsche et al. (2005) recommended that consensus be formed over the use of a theoretically derived, and well defined measure, such as the DMQ-R. Indeed, the present review confirms a significant shift in this direction. The proportion of studies utilising the DMQ-R—and related versions (DMQ, Modified-DMQ-R; DMQ-R SF)—increased, from 32% pre-2004 to 78% post-2004, allowing easier and more confident conclusions to be drawn about drinking motives, through the examination of *social*, *enhancement*, *coping* and *conformity* factors. As such, these four motives provide the base categories by which the relationships between drinking motives and alcohol behaviour is explored in the following sections, and reference to other motive factors are only made when illustrative of additional nuance.

**2.2.2 Relationships between drinking motives, alcohol use and alcohol-related harm.** Having outlined the various ways in which drinking motives have been measured and conceptualised in studies since 1989, an important next step in the current investigation is to establish the state of evidence regarding relationships between drinking motives and alcohol related variables such as alcohol use and related harm. This information is important for understanding, predicting and potentially modifying

problematic drinking behaviour. This knowledge is also relevant to the main aim of the thesis; to determine if and how these relationships can be better understood by treating drinking motives as context-specific.

For each of the four most commonly identified drinking motives within the recent literature (*social, enhancement, coping* and *conformity*), associations with alcohol use and alcohol-related consequences are discussed. As above, the conclusions of Kuntsche et al.'s (2005) review of the literature are briefly summarised, followed by a detailed review of the literature published after 2004. Additionally, a brief summary of the evidence regarding longitudinal trends in drinking motive endorsement, as well as the study of combinations of drinking motives is presented.

**2.2.2.1 Drinking for social rewards.** While *social* reasons for drinking (e.g., 'to help celebrate with friends', 'to make social gatherings more fun', 'to enjoy a party') are some of the most commonly reported by young people, Kuntsche et al (2005) also conclude that they are associated with only moderate levels of alcohol consumption (quantity, frequency, and drunkenness/binge drinking), and are unrelated (or even weakly negatively related) to drinking problems. The literature post-2004 is largely supportive of these conclusions.

In a sample of Hungarian high school students, Piko (2006) found that student endorsement of social drinking motives positively predicted alcohol use (standardised path coefficients from .19 to .24) in a number of models that accounted for a range of other social and demographic factors. Similar associations between social drinking motivation and alcohol use (frequency and quantity) have been recently reported elsewhere in Europe (e.g., Kuntsche et al., 2006b; Kuntsche & Kuntsche, 2009; Kuntsche & Stewart, 2009; Mazzardis et al., 2010; Willem, Bijttebier, Claes, & Uytterhaegen, 2012), North America (V V Grant et al., 2007; Martens, Rocha, et al., 2008), Australia (Halim, Hasking, & Allen, 2012), and Thailand (Siviroj et al., 2012),

with standardised path coefficients ranging from .19 to .50. While there is some empirical evidence to suggest that social drinking motivation is less strongly associated with heavy episodic drinking (with standardised path coefficients of around .10; Kuntsche & Kuntsche, 2009; S. Müller & Kuntsche, 2011), qualitative studies still report the important role social reasons play in binge drinking behaviour (Coleman & Cater, 2005a; Dodd et al., 2010).

Additionally, a longitudinal study of 454 Dutch adolescents by Schelleman-Offermans et al. (2011), found that *social* (but not *coping* or *conformity*) motivation predicted heavy drinking and total weekly consumption one year later, while the *enhancement* motivation acted only as a relatively weak predictor. That is, social drinking motivation may play a unique role in predicting future drinking behaviour, however these findings require replication before a confident conclusion can be drawn.

Findings of a positive social motivation-use link have not always been observed when the influence of other motives have been controlled for. For example, a large study of 5118 Swiss, 2557 Canadian and 607 United States school students found no unique relationship between social motivation and alcohol use in any of the cultures sampled (Kuntsche et al., 2008), nor was a unique link found in three smaller studies of US university undergraduates (Merrill & Read, 2010), Spanish and Hungarian young adults (Németh, Urbán, et al., 2011) or Welsh adolescents (Chalder et al., 2006). While these findings somewhat question the ability of social motivation to explain alcohol use beyond that already explained by other drinking motives, taken as a whole the current review finds good empirical evidence that social drinking motivation is consistently associated with moderate increases in alcohol use.

Regarding alcohol-related consequences, a recent Australian study of 221 young adults found social motivation to be the second strongest predictor (standardised beta = .28) of alcohol-related problems, as measured by AUDIT scores (Lyvers et al., 2010).

While similar associations have been found for RAPI scores (LaBrie et al., 2007; LaBrie, Kenney, Migliuri, & Lac, 2011; Martens, Rocha, et al., 2008) and other measures of alcohol-related problems (O'Connor & Colder, 2005; Rafnsson, Jonsson, & Windle, 2006). Typically, these studies reported social motivation to be the second strongest predictor of alcohol-related problems, behind enhancement motivation.

However, when studies control for the effect of alcohol consumption, social motivation tends to show no effect (Kuntsche & Kuntsche, 2009; LaBrie et al., 2011; Merrill & Read, 2010; Norberg, Olivier, Alperstein, Zvolensky, & Norton, 2011; Patrick, Lee, & Larimer, 2011; Willem et al., 2012) or a weak protective effect (Gmel et al., 2012) on a range of negative consequences. For example, the study of 5633 Swiss adolescents conducted by Gmel and colleagues (2012), found that social motivation reduced the odds of exposure to violence, friendship problems, trouble with the police, and regretted sexual intercourse when the direct effect of frequency of alcohol use was controlled. These findings suggest that the harm associated with socially motivated drinking may be related to increased consumption, rather than it leading to a particularly risky style of drinking.

Based on these findings, it appears that drinking to improve social gatherings is relatively normative for young people, and is associated with moderate levels of alcohol consumption and alcohol-related harm. This may be because severe intoxication limits one's ability to be sociable, and is therefore avoided when drinking for social reasons. Further, the consequences associated with socially motivated drinking appear to be related to increased alcohol consumption rather than being an inherently risky type of drinking. Interestingly, Mohr et al. (2005) demonstrated, via a daily process study, that socially motivated young adults actually drank less following days of more positive social contacts. While at first these findings seem counter-theoretical, they may simply indicate that drinking for social reasons typically occur concurrently with social events

(e.g. at a party, or gathering), rather than in response to them (as appears to be the case with enhancement reasons; Mohr et al., 2005). Therefore, social drinking motivations may be more closely associated with present social contact, or even prospective social contact—as in the scenario of drinking prior to a party or gathering.

**2.2.2.2 *Drinking to enhance positive internal events.*** In their review, Kuntsche et al. (2005) conclude that drinking for *enhancement*-related reasons (e.g. to feel good, to improve mood, to get high, for the taste, for fun) are linked with heavy episodic drinking, but noted that this association appears to be predominantly the result of a single item: ‘to get high / drunk’ (or similar). Additionally, they found mixed evidence linking the enhancement motive to problematic drinking, irrespective of whether drinking ‘to get high’ contributed to its measurement.

When considering the more recent literature, Palmqvist (2006) found that frequent alcohol users more commonly reported drinking ‘to get drunk’ (18% more frequently), but less commonly reported drinking ‘to have fun’ (4% less frequently) than occasional drinkers. Fraga et al. (2011) found that frequent drinkers more commonly drank because they ‘liked the taste’, compared with occasional drinkers. Further, Kuntsche and Gmel (2006) found that drinking because ‘I like the effect of alcohol’ most strongly predicted alcohol consumption (beta weight = .23) and drunkenness (beta weight = .40) in a sample of Swiss adolescents. Consistent with the conclusions made by Kuntsche et al (2005), it appears that only some of the enhancement-related reasons for drinking—specifically ‘drinking for the taste’ and ‘drinking to get drunk / for the effect’ (but not ‘to have fun’)—are predictive of increased alcohol consumption (and particularly binge drinking).

Due largely to the increased popularity of DMQ-R based measures, the vast majority of studies in the current review designate drinking ‘to get high’ as an indicator of *enhancement* motivation. As such, it is likely that the increased consistency by which

enhancement motivation has been measured is partly responsible for a growing body of empirical support linking enhancement motivation with heavy alcohol use generally. For example, in a study of 5649 12- to 18-year-olds, Kuntsche and Stewart (2009) found enhancement motivation to be the strongest predictor of alcohol consumption (beta weight = .32) and binge drinking (beta weight = .32) compared to other drinking motives. With very few exceptions (Merrill & Read, 2010; Németh, Kuntsche, Urbán, Farkas, & Demetrovics, 2011; Siviroj et al., 2012), recent empirical findings confirm this strong link between enhancement motivation and frequent, heavy alcohol use (e.g., Kuntsche et al., 2008; Lewis et al., 2008; Martens, Rocha, et al., 2008; Mazzardis et al., 2010; Mezquita, Stewart, & Ruipérez, 2010; S. Müller & Kuntsche, 2011; Németh, Urbán, et al., 2011; Patrick, Lee, et al., 2011; Schelleman-Offermans et al., 2011; Van Tyne et al., 2012; Yusko, Buckman, White, & Pandina, 2008)—reporting standardised path coefficients / beta weights ranging from .18 to .50 (mean = .35). Additionally, Lindgren et al. (2011) demonstrated that an implicit measure of enhancement motivation predicts unique variance in alcohol use, unexplained by traditional (self-report) measures of this type of motivation.

With regard to problematic alcohol-related consequences, enhancement motivation has recently been shown to predict adolescents' scores on the Rutgers Alcohol Problem Index (Németh, Urbán, et al., 2011; Yusko et al., 2008), and the Alcohol Use Disorders Identification Test (Lyvers et al., 2010; Willem et al., 2012)—with effect sizes of around .40. However, the relationship between enhancement motivation and alcohol-related consequences appears greatly weakened or non-existent when the direct effect of alcohol consumption is controlled for (e.g., Kuntsche et al., 2008; Norberg et al., 2010; Norberg et al., 2011; Patrick, Lee, et al., 2011; Willem et al., 2012). In a similar respect to socially motivated drinking, it appears that the negative consequences associated with enhancement motivated drinking occur primarily as a

result of increased consumption. This view is further supported by Kuntsche, Knibbe, Engels, and Gmel (2007a) who found weak but significant indirect effect (via alcohol consumption) of enhancement motivation on bullying and fighting behaviour, but no direct link between the two.

Conceptually, enhancement drinking motivation is thought to reflect a person's desire to develop internally experienced rewards—such as pleasant thoughts, sensations, feelings, urges, and memories (M. L. Cooper, 1994). Providing empirical support for this positive reinforcement mechanism, O'Connor and Colder (2005) found that enhancement drinking motivation mediated the positive link between reward sensitivity—the extent to which a person is reward orientated—and heavy drinking, however it should be noted that social and coping motives also acted as partial mediators in this relationship. Other studies have shown that young people who drink for enhancement reasons are more likely to consume certain types of alcohol (beer and spirits; Kuntsche et al., 2006a), to drink on weekends (Kuntsche & Cooper, 2010), and to drink away from home, have stronger social relationships, and have more heavy drinking peers (Kuntsche, Knibbe, Engels, & Gmel, 2010), compared to those who drink for other reasons. Perhaps due to the heavy episodic nature of enhancement motivated drinking, the consequences appear to be particularly physical in nature—for example, vomiting, memory loss, injury, and hangover—(Norberg et al., 2011), violent behaviour (Kuntsche & Kuntsche, 2009; Mihic et al., 2009) and trouble with the police (Gmel et al., 2012).

**2.2.2.3 *Drinking to reduce or avoid negative internal events.*** *Coping*-related reasons for drinking (e.g. to forget worries/concerns, to cheer-up, to manage depression/anxiety), while relatively uncommon, were found in the review by Kuntsche et al. (2005) to be associated with heavy episodic drinking. Additionally, those who were highly coping motivated were found to be more likely than others to experience

not only drinking related problems, but also unrelated consequences such as academic failure, inter-personal conflict and criminal behaviour (Kuntsche et al., 2005).

The more recent literature contains inconsistent findings regarding alcohol use. Some studies have reported moderate to strong positive associations (correlations of around .30) between coping motivation and various measures of alcohol consumption (frequency, quantity and heavy episodic drinking; Armeli et al., 2008; Catanzaro & Laurent, 2004; Goldstein & Flett, 2009; Graziano et al., 2012; Lindgren et al., 2011; Siviroj et al., 2012; S. H. Stewart et al., 2011). For example, a study of 210 school students by Catanzaro and Laurent (2004) found coping motivation to be correlated to measures of recent drinking ( $r = .35$ ), lifetime drinking ( $r = .41$ ), and drunkenness ( $r = .47$ ). However, these findings are contrasted by numerous others that reported weak or nonexistent relations between coping motivation and alcohol use (e.g., Comasco et al., 2010; Kuntsche et al., 2006b; Martens, Rocha, et al., 2008; Merrill & Read, 2010; Németh, Kuntsche, et al., 2011; Rafnsson et al., 2006; Schelleman-Offermans et al., 2011). In a study of 324 English adolescents, Topper, Castellanos-Ryan, Mackie, and Conrod (2011) found no correlation between coping motivation and quantity/frequency of alcohol use—when measured concurrently, or after 12 months—and similar non-significant findings have been reported within an Australian (Norberg et al., 2010) and Spanish (Mezquita et al., 2010) sample.

Further, when the influence of all drinking motives are considered simultaneously, studies in the current review typically found no unique relationship between coping motivation and alcohol use (Crutzen et al., 2010; V V Grant et al., 2007; Hauck-Filho et al., 2012; Mezquita et al., 2010; Németh, Urbán, et al., 2011; Norberg et al., 2010; Patrick, Lee, et al., 2011; Topper et al., 2011; Willem et al., 2012). These findings suggest that coping motivation adds little if anything to the explanation of young people's alcohol use beyond that provided by other drinking motives.

In their review, Kuntsche et al (2005) found coping motivation to be particularly related to heavy episodic drinking relative to other measures of alcohol consumption (frequency and quantity), however this distinction was not generally supported by the recently reviewed literature (e.g., Crutzen et al., 2010; Kuntsche et al., 2006b; Kuntsche & Kuntsche, 2009; Lindgren et al., 2011; Németh, Urbán, et al., 2011; Schelleman-Offermans et al., 2011; S. H. Stewart et al., 2011). For example, in a sample of 584 Brazilian university students, Hauck-Filho et al. (2012) found coping motivation to be similarly correlated to alcohol use frequency ( $r = .26$ ) and quantity ( $r = .24$ ), as to drunkenness ( $r = .29$ ), and unrelated to all measures of use when considering the influence of multiple drinking motives simultaneously. Similarly, Kuntsche et al. (2006b) found coping motivation to be similarly related to the frequency and quantity of alcohol use, as with episodes of heavy episodic drinking (standardised path coefficients of .12, .06 and .15 respectively). In contrast however, Anderson et al. (2011) found that whilst coping motivation did not significantly increase the level of alcohol consumed, it more than doubled the odds of heavy episodic drinking ( $OR = 2.17$ ).

In summarising these findings so far, notwithstanding a high degree of variability within the literature, coping drinking motivation appears only weakly related to measures of alcohol use (frequency, quantity and heavy episodic drinking), especially when considered in the context of other drinking motives. These recent empirical findings differ somewhat from those reported previously by Kuntsche et al. (2005), in that the relationship between coping motivation and heavy episodic drinking did not appear particularly strong, as compared to other measures of alcohol use.

What does appear clear from the current review papers is a positive link between coping motivation and a range of adverse consequences which is consistent with the past review (Kuntsche et al., 2005). For example, Gmel et al. (2012) found in a sample of 5633 Swiss adolescents, that the odds of experiencing physical fights, problems with

friends, trouble with police and regretted sexual intercourse were greatest for coping motivated (as compared with other types of motivated) drinkers. Further, this pattern was observed irrespective of whether the adolescents attributed alcohol as a cause. Similarly, in a study of Hungarian festival goers, Németh, Kuntsche, et al. (2011) found coping motivation to be most strongly related of all drinking motives to self-reported problems with academic performance (beta weight = .31), risky sexual intercourse (beta weight = .23), and violence (beta weight = .30). Numerous additional studies provide support for a positive association between coping motivation and AUDIT scores (Arbeau et al., 2011; Ham et al., 2009; Hasking, Lyvers, & Carpio, 2011; Van Tyne et al., 2012; Willem et al., 2012), RAPI scores (Lewis et al., 2008; Martens, Rocha, et al., 2008; Mezquita et al., 2010; Neighbors et al., 2004; Németh, Urbán, et al., 2011) and a range of other measures of alcohol related harm (Crutzen et al., 2010; Kuntsche et al., 2008; Kuntsche, Wiers, et al., 2010; Merrill & Read, 2010; O'Connor & Colder, 2005; Rafnsson et al., 2006). However, in many of these studies, enhancement motivation still demonstrated a stronger link to alcohol related problems than coping motivation.

Unlike drinking for social and enhancement-related reasons (described above), coping motivated drinking appears to be problematic even when the influence of alcohol consumption is controlled for. For example, LaBrie et al. (2011) found coping motives to be the strongest predictor of RAPI scores (beta weight = .23) in a sample of 550 college females, after controlling for a number of demographic variables and the total number of alcoholic drinks consumed per month. Similarly, Kuntsche et al. (2007a) found that coping motivation predicted violent behaviours both directly, and indirectly (via alcohol consumption), and argued that people who drink to cope may have problem solving deficits that predispose them to adverse consequences that are unrelated to alcohol use. A further study by Merrill and Read (2010) found support for a direct link (not via alcohol use) between coping motivation and academic problems, risky

behaviours, and self-care problems, adding support to the view that those who drink to cope also experience problems unrelated to their drinking.

As the direction of causality cannot be inferred, these findings are consistent with the view that people may sometimes drink to manage the negative internal events brought about by a variety of existing problems. That is, young people who readily endorse coping motivation may typically experience multiple life stressors which exacerbate alcohol-related, as well as alcohol unrelated, negative outcomes. This view has received some support within the recent literature. The increased likelihood that bullied and victimised adolescents will experience future alcohol-related problems compared with their peers, appears at least partly attributable to increases in coping motivation (Topper et al., 2011). Further, Goldstein and Flett (2009) found that coping motivated drinkers reported higher levels of neuroticism, negative affect and anxiety sensitivity, and lower positive affect than other motivated drinkers, and Littlefield et al. (2010) reported that coping motivation explained the changing relationship between personality (impulsivity and neuroticism) and problematic alcohol use.

Other studies have found coping motivation to mediate the link between a range of stressors—depression (S. H. Stewart et al., 2011), negative affect (Martens, Neighbors, et al., 2008), and social anxiety (Blumenthal et al., 2010; Ham et al., 2009; Lewis et al., 2008; Patrick, Lee, et al., 2011)—and problematic alcohol use. Notably, in contrast to these findings and at odds with theoretical expectation, Buckner, Eggleston, and Schmidt (2006) found enhancement (but not coping) motivation to mediate the link between social anxiety and alcohol-related problems, raising the possibility that those high in social anxiety may experience problems as a result of drinking to feel good, rather than to avoid feeling anxious. Elaborating on this research, Norberg et al. (2010) found evidence of gender differences in these relationships. Coping motivation was

found to mediate the social anxiety-harm link for females only, while socially anxious men experienced more problems when drinking for enhancement reasons.

Further challenging the view that people drink to cope to attenuate the distress associated with negative life events Hussong, Galloway, and Feagans (2005) found that whilst high coping motivated university students drank more on days of elevated fear, unexpectedly they drank less on days of sadness, boredom and hostility, compared with those low in coping motivation. Therefore, in addition to the potential gender differences raised in the previous paragraph, this research calls into question whether differential mechanisms may operate with regard to drinking that is motivated to cope with depressive symptoms (as reflected by sadness, boredom and hostility) as compared to anxious symptoms (fear). However, studies that have addressed this by utilising the Modified-DMQ-R report inconsistent findings regarding the differences between anxiety related coping motivation (*coping-anxiety*), and depression related coping motivation (*coping-depression*). While V V Grant et al. (2007) found *coping-anxiety* (but not *coping-depression*) to be directly linked to alcohol related problems (not via alcohol consumption), Willem et al. (2012) found the opposite to be true. Further, Mezquita et al. (2010) reported roughly equivalent relations between both types of coping motives with alcohol related problems, but did not test for relative levels of influence via alcohol use.

In summary, coping motivation appears to be directly and indirectly (via alcohol use) related to adverse consequences, particularly ones relating to academic performance (Kuntsche et al., 2006b), social problems (Norberg et al., 2011) and self-care (Merrill & Read, 2010). These findings concur with those reported by Kuntsche et al. (2005) and support the view put forth by M. L. Cooper et al. (1995), that while drinking to cope may be effective in the short term, the avoidant nature of the coping mechanism typically leads to problems (of both alcohol-related and unrelated kinds) in

the long term. However, the research explaining the mechanism by which coping motivation associates with negative outcomes remains somewhat unclear. There is some evidence to suggest that females are more likely than males to experience problems when drinking to cope with social anxiety. Conversely, socially anxious males, appear to be at the greatest risk of having problems when they drink to feel good / to get high (i.e., for enhancement reasons). Although some studies have found differential outcomes for coping relating to anxiety and depression, the nature of these differences is not clear.

**2.2.2.4 Drinking to avoid negative social consequences.** No specific findings were made by Kuntsche et al. (2005) regarding associations with *conformity*-type reasons for drinking (e.g. ‘to fit in’, ‘to be liked’, ‘so you won’t feel left out’) due to a lack of available studies. However, since 2004—and due mainly to the increased popularity of the DMQ-R—a number of studies now inform our understanding of the role of conformity motivation with regard to alcohol use and alcohol-related problems.

Conformity motivation appears to be unrelated to various measures of alcohol use when assessed using bivariate correlations (e.g., Blumenthal et al., 2010; Ham et al., 2009; Lewis et al., 2007; Lyvers et al., 2010; Merrill & Read, 2010; O'Connor & Colder, 2005; Urbán et al., 2008), however some studies have also found a weak to moderate positive relationship (correlations of around .20; Martens, Rocha, et al., 2008; Neighbors et al., 2004; Norberg et al., 2010; Yusko et al., 2008).

When the influences of multiple drinking motives are considered simultaneously, the relationship between conformity motivation and alcohol use typically remains non-significant (Chalder et al., 2006; Hasking et al., 2011; Patrick, Lee, et al., 2011), or becomes weakly negative (V V Grant et al., 2007; Kuntsche & Stewart, 2009; Kuntsche, Wiers, et al., 2010; Mazzardis et al., 2010; Németh, Urbán, et al., 2011). For example, when controlling for gender and age, Kuntsche et al. (2006b)

found conformity motivation to have a negative unique relationship with the quantity (beta weight =  $-.15$ ) and frequency (beta weight =  $-.06$ ) of alcohol use, and no relationship with occasions of heavy episodic drinking. As such, conformity motivation appears to represent the least influential motive of the DMQ-R, with respect to alcohol consumption.

Regarding alcohol-related problems, a number of studies have found positive bivariate correlations (of around  $.25$ ) between conformity motivation and RAPI (Lewis et al., 2008; Martens, Rocha, et al., 2008; Neighbors et al., 2004; Németh, Urbán, et al., 2011), and AUDIT scores (Arbeau et al., 2011; Lyvers et al., 2010), however these associations were weak relative to other drinking motives. When the influence of all drinking motives are taken into account, findings are more variable. For example, a number of studies reported no association, or a weak positive association, between conformity motivation and RAPI scores (Németh, Urbán, et al., 2011), social-, physical-, personal-, and role-related problems (Norberg et al., 2011), and academic problems, violence, and regretted sexual intercourse (Crutzen et al., 2010; Kuntsche et al., 2006b; Kuntsche & Kuntsche, 2009; Németh, Kuntsche, et al., 2011). When controlling for frequency of alcohol use, Gmel et al. (2012) also found a negative relationship between conformity motivation and regretted sexual intercourse. In contrast, Crutzen et al. (2010) found regretted sexual intercourse to be strongly uniquely related to conformity motivation ( $OR = 8.8$ ) after controlling for the influence of life stressors and other drinking motives.

In other studies that controlled for the influence of alcohol use, Merrill and Read (2010) found a positive link between conformity motivation and problems relating to impaired control (standardised path coefficient =  $.23$ ), self-care (standardised path coefficient =  $.21$ ) and diminished self-perception (standardised path coefficient =  $.19$ ) and Kuntsche et al. (2007a) found similar direct links to bullying and fighting (with the

exception of fighting in girls). LaBrie et al. (2011) reported a weak positive association with RAPI scores after controlling for frequency of alcohol use, and a number of other studies have reported non-significant associations between conformity motivation and alcohol-related problems when controlling for alcohol use (Norberg et al., 2011; Patrick, Lee, et al., 2011),

In summary, although conformity motivation appears unrelated to measures of alcohol use, their relationship with various adverse consequences remains unclear. While there is some indication that conformity motivation may be directly related (not via alcohol consumption) to problems such as regretted sexual intercourse (Crutzen et al., 2010) and impaired control (Merrill & Read, 2010), the existing evidence is mixed (e.g., Gmel et al., 2012).

**2.2.2.5 Developmental trends.** Longitudinal studies provide evidence to suggest that, whilst relatively stable drinking motives do vary throughout an individual's development, most likely in relation to events and goals specific to the time of life. For example, Patrick and Schulenberg (2011) demonstrated that enhancement-type reasons (to get high, and to have a good time) most strongly predicted binge drinking involvement in young adulthood—a time of life associated with emerging independence and relatively few responsibilities. However, in the later part of early adulthood—when family and work pressures typically strengthen—the coping-type reasons (to relax, to escape) were more commonly reported, and 'drinking to escape' most accurately predicted binge drinking involvement. Similarly, when tracking alcohol use and reasons for drinking over a period of 15 years through adolescence and early adulthood, M. L. Cooper et al. (2008) found that while enhancement motivation peaked at around age 22, coping motivation continued to rise until around age 25 years. A shift from social drinking motivation, towards coping and enhancement motivated drinking has also been observed in early adolescence (Schelleman-Offermans et al., 2011). Interestingly, a

developmental shift from less direct drinking motives (social and conformity reasons) to more direct ones (enhancement and coping) has also been observed cross-sectionally. For example, Martens, Rocha, et al. (2008) found freshmen had higher rates of conformity motives than seniors in their study of 441 north American college students. A somewhat different trajectory was found by Littlefield et al. (2010) in their longitudinal study of 18-35 year olds. Using a different measure to the DMQ-R, they found that endorsement of both enhancement and coping drinking motives declined from age 18 to 29 years, but that while enhancement motivation remained stable in the following 6 years, coping motivation rose to a level higher than baseline levels (at 18 years old).

Using cross-sectional data, Cox, Hosier, et al. (2006) found that, in earlier (compared to later) adolescence, negative reinforcement reasons for drinking (coping and conformity type reasons) were better predictors of alcohol related problems than positive reinforcement reasons (enhancement and social type reasons). Additionally, they noted that the relationship between negative drinking reasons and alcohol-related problems was less dependent on the amount of alcohol consumed in late compared with early adolescence. That is, drinking for negative reasons may be more common in late adolescence (compared with early adolescence) and be associated more directly (not via alcohol consumption) to a range of negative consequences.

Only three studies under review specifically assessed the extent to which self reported reasons for drinking predict long-term future drinking outcomes. Patrick, Schulenberg, et al. (2011) found that the odds of 18 year olds developing an alcohol use disorder 17 years later were greater for those who initially endorsed drinking ‘to get high’ (95% confidence OR = 1.1-1.8), ‘for boredom’ (OR = 1.2-1.9), ‘to relax’ (OR = 1.0-1.6) and ‘for anger/frustration’ (OR = 1.2-2.2), and were lower for those who endorsed drinking ‘to get away from problems’ (OR = 0.52-0.98). A full cross-lagged

panel study of Dutch adolescents by Schelleman-Offermans et al. (2011) revealed that, after controlling for the strong effect of baseline measures of alcohol use, social drinking motivation predicted total consumption ( $\beta = 0.15$ ) and heavy drinking ( $\beta = 0.14$ ) one year later, while conformity motivation had a slightly protective influence on heavy drinking only. Enhancement and Coping motives failed to predict drinking outcomes one year later. In contrast, a third study by M. L. Cooper et al. (2008) found that higher scores on both enhancement and coping motivation predicted heavy drinking 5-12 years later.

Taken together, the findings regarding the longitudinal predictive value of drinking motives is equivocal, with inconsistent and generally low effects reported. A potential explanation for this is that motives may be better conceptualised as state like (or at least as having a state-like components). This topic is further explained in chapter three.

In summary, these findings are consistent with the motivational model of alcohol use (Cox & Klinger, 1988), suggesting that drinking motives vary with relation to the changing life goals of an individual. It appears that the normative trajectory of drinking motivations roughly resembles an inverted 'U', and includes a shift from social and enhancement motives in adolescence, towards coping motivation in young adulthood. Additionally, at this stage there is insufficient research to determine the utility of drinking motives in predicting subsequent alcohol outcomes.

**2.2.2.6 Combinations of motives.** After accounting for demographic variables, drinking reasons have been shown to account for around 20-30% of the variance in alcohol use and drunkenness (Kuntsche & Gmel, 2006; Kuntsche & Kuntsche, 2009), and 30-40% of the variance in alcohol-related problems (Németh, Urbán, et al., 2011). Predictably, the greater number of drinking reasons endorsed by young people the more alcohol they are likely to consume (Kuntsche & Gmel, 2006), and the greater their

exposure to alcohol-related harms (Coffman et al., 2007; Patrick & Maggs, 2010). In the paragraphs below consideration is now given to research, identified in the current review, investigating meaningful combinations of drinking motives.

**2.2.2.7 Motive profiles.** Although young people report multiple simultaneous reasons for drinking (i.e., each individual has a *motive profile*), only four of the eighty-nine studies under review have examined how different within-person *profiles* of drinking motives relate to drinking outcomes (outlined in section 2.2.1.5 above; Coffman et al., 2007; Mackie et al., 2011; Mun et al., 2008; Patrick & Maggs, 2010). Coffman et al. (2007) found that *experimenters* exhibited the lowest risky drinking, followed by *relaxers*, *thrill-seekers* and *multi-reasoners*. These findings support the view that those with multiple reasons for drinking are likely to engage in more risky drinking behaviour, compared to those who drink for specific reasons. Further, Patrick and Maggs (2010) identified 3 latent classes based on motivations for and against drinking: *low for/high against*; *average*; and, *high for/low against*. Unsurprisingly, a significant difference was observed in the frequency of alcohol use, frequency of binge drinking and RAPI scores between all three motive groups, such that those belonging to the *low for/high against* group displayed the lowest risk, while those belonging to the *high for/low against* group displayed the highest risk.

Mackie et al. (2011) identified 4 distinct motive groups, based on each individuals' profile of drinking motives and location of alcohol consumption: *social*; *family-orientated*; *enhancement/social*; and, *coping/social*. Using the *social* motives class as the reference group, the *family-orientated* group predicted greater anxiety and anxiety sensitivity (fear of anxiety symptoms), the *social/enhancement* group predicted greater aggression, delinquency and depression, and the *coping/social* group predicted mood issues and high alcohol consumption. Taken together, these studies demonstrate that the specific combination of motives, rather than simply the degree of each one in

isolation, may have an important bearing on the alcohol outcomes experienced and the underlying mechanism of action.

**2.2.2.8 Positive versus negative reinforcement motives.** The motivational model of alcohol use, described by Cox and Klinger (2004b), draws a distinction between reasons for alcohol use that are driven by positive versus negative reinforcement mechanisms. In exploration of this differential mechanism, the current review finds that reasons for drinking that relate to the attainment of rewards—*enhancement* and *social* motives—are commonly endorsed, highly inter-correlated, associated with the greatest levels of alcohol use, and appear to be related to problems that can be generally explained by the level of alcohol consumed. In comparison, the less commonly endorsed negatively reinforcing drinking motives—*coping* and *conformity*—both explain very little unique variance in alcohol use, yet appear to be positively associated (more clearly in the case of coping motivation) with both alcohol related, and un-related problems. For example, Martens, Rocha, et al. (2008) found that while only positive reinforcement motives were related to measures of alcohol use, both positive- and negative-reinforcement motives were equally linked to alcohol-related problems. Another study by Lewis et al. (2008) demonstrated that negative (but not positive) reinforcement motives, acted as mediators, in addition to alcohol use, between social anxiety and negative consequences, in heavy drinking students. Indeed, young people who drink for negative-reinforcement reasons may do so as a result of predisposing problems (or dispositions), and may drink in ways or situations that are particularly problematic. These findings, relating to alcohol related behaviours and outcomes, provide support of a shared, avoidance-orientated mechanism of action between coping and conformity motives, and a shared approach-orientated mechanism of action between enhancement and social motivations.

## 2.3 Summary and Conclusion

In summary, 90 unique studies published since 2004 informed the present update of Kuntsche et al.'s (2005, 2006d) systematic review investigating why young people drink. Consistent with the original review, great heterogeneity was found in the way drinking motives were measured—ranging from implicit measures, qualitative methods, identification of individual drinking reasons as well as the use of various multi-dimensional self-report instruments. Of particular relevance to this thesis, only two (2%) of the studies reviewed measured drinking motives repeatedly, across multiple drinking episodes within each individual (Arbeau et al., 2011; Mihic et al., 2009). This provides strong suggestion that drinking motives have been considered trait-like, stable and generalised in nature by the vast majority of researchers, despite evidence of some cross-situational variability (Arbeau et al., 2011).

Most measures appear to have been derived atheoretically, and many use similar items to assess conceptually different motive factors, making generalisations and comparisons somewhat challenging. However, a clear consensus appears to be forming over the use of the DMQ-R (Cooper, 1994)—a theoretically derived multi-dimensional instrument that discriminates between *positive* and *negative* reinforcement reasons for drinking, and between *internal* and *external* sources of drinking motivation. Four distinct factors result, and are typically endorsed by young people in the following order of frequency: *social*, *enhancement*, *coping* and *conformity* motives.

Consistent with Kuntsche et al. (2005), it appears that drinking to improve *social* gatherings is normative for young people, and is associated with moderate levels of alcohol consumption and alcohol-related problems—possibly as severe intoxication limits one's ability to socialise. Drinking for *enhancement*—for the pursuit of internal rewards—is associated with high levels of alcohol consumption (particularly of a heavy episodic nature), and with problems directly related to this heavy drinking, such as violence, memory loss, injuries, and hangovers. Consistent with the theoretical

underpinnings of the DMQ-R, it also appears that certain combinations of drinking motives share similar mechanisms of action. Taken together, these two positively-reinforcing motives tend to be commonly reported, strongly related to measures of alcohol use, and are also related to a range of harmful consequences that can largely be explained by the level of alcohol consumed.

Drinking to *cope*, whilst inconsistently associated with measures of alcohol use, appears more consistently linked to alcohol related harm, both directly and via alcohol use. Young people who drink to avoid or reduce troubling feelings, thoughts, memories and sensations are more likely to be exposed to significant life stressors (such as victimisation), and to experience negative consequences that are both related, and unrelated, to their use of alcohol (e.g., Norberg et al., 2011; Topper et al., 2011).

*Conformity* motivation also appears unrelated to measures of alcohol use. However its relationship with various adverse consequences remains somewhat unclear. While there is some indication that conformity motivation may be directly related (not via alcohol consumption) to problems such as regretted sexual intercourse (Crutzen et al., 2010), impaired control, self-care and diminished self perception (Merrill & Read, 2010), the existing evidence is mixed (e.g., Gmel et al., 2012). Taken together, these two negatively-reinforcing motives (*coping* and *conformity*) are typically reported less commonly than other motives, are weakly related or unrelated to measures of alcohol use (especially when accounting for the influence of other motives), and tend to be associated with a range of alcohol-unrelated consequences.

Recent studies support the contention that the more drinking motives endorsed by an individual, the greater the likelihood of increased alcohol consumption, and harmful consequences (e.g., Coffman et al., 2007; Patrick & Maggs, 2010). Further, within-person patterns of simultaneously held reasons for drinking (motivation profiles) have been shown to differentially predict drinking outcomes, suggesting that the

specific combination of motives, not just the degree of motive endorsement, may be important (e.g., Mackie et al., 2011).

This review provides a comprehensive understanding of how drinking motives have been measured, and how commonly researched motives relate to alcohol use and harm. This leads to a broader discussion about the, as yet, uncertain role situational and contextual factors play in determining why, and how, young people drink. Although tentative in nature, evidence suggests that drinking motives vary from one situation to another (Arbeau et al., 2011). What remains largely unknown, is precisely what aspects of the drinking context or situation may be relevant to this process, or indeed if and how they interact with the drinking motives of young people. Further, a theoretically informed explanation of these processes is required.

The next chapter attempts to address these issues via an in depth critique of the current literature relating to the role of contextual factors in drinking motives. Drawing on research within the drinking motive literature, and also more broadly, a theoretically and empirically based argument is made, that drinking motives may more accurately and usefully be conceptualised and measured as context-specific constructs.

### Chapter Three – Situated Drinking Motives

The core argument put forward in the previous two chapters is that drinking motives may best be conceptualised as situation-specific: that is, instead of being dispositional in nature, the drinking motives of young people may be contingent on aspects of the context in which alcohol is consumed. This is an important conceptual shift from the main body of drinking motive literature that treats motives in a trait-like way. If found to be accurate, research investigating situated drinking motives may provide significant new insight into how and why young people drink, that is overlooked when motives are de-contextualised. In particular, not only could situation specific drinking motives better explain variability in alcohol use and consequences; the reconceptualisation would allow investigation of novel questions such as whether drinking motives relate differently to alcohol use and harm depending on the nature of the drinking context. In this chapter, the empirical and theoretical research investigating the relationships between aspects of the drinking context and the reasons given by individuals for drinking are reviewed, and the argument for *context-specific drinking motives* is made.

Context can be broadly defined as the circumstances or events that form the environment within which something exists and that contribute to the meaning and understanding of the phenomena (Poland et al., 2006). While this definition, which incorporates aspects of culture and upbringing as well as situational factors, is too general for the current investigation, it usefully emphasises the well accepted role context plays in understanding the mechanisms that underlie behaviour. For the purposes of the current critique, however, context is restricted to aspects of the immediate drinking setting (such as the day of the week, the location, the drinking circumstance, and the social context) and affect variables, as these represent features most likely to influence people's reasons for drinking from one moment to the next.

Traditionally, a connection between drinking context and drinking motives has been somewhat implicitly acknowledged by authors, as evidenced by early research that variously categorise ‘drinking contexts’ (e.g., Annis, 1984; Cutter & O’Farrell, 1984; Glynn, LoCastro, Hermos, & Bossé, 1983) and ‘drinking motives’ (e.g., M. L. Cooper, 1994; Farber et al., 1980) by a mix of contextual / motivational factors. For example, ‘drinking context’ measures such as the Social Context of Drinking Scale (Thombs & Beck, 1994; Thombs et al., 1993) and Drinking Context Scale (T O’Hare, 1997; T. O’Hare, 2001) identify *context* dimensions such as *negative coping*, *sex seeking*, *peer acceptance*, and *social facilitation*, however these dimensions could equally well be described as *motives* for drinking. The opposite is also true; with many multifactor measures of drinking motives (outlined in detail in the previous chapter) clearly containing items that incorporate aspects of the situational drinking context—such as the drinking circumstance, social environment and mood (e.g., ‘because it helps you enjoy a *party*’, ‘to celebrate a special occasion *with friends*’, and ‘to cheer you up when you are *in a bad mood*’ respectively; items from the DMQ-R; Cooper, 1994).

Notwithstanding this implicit acceptance within the literature that motivation and context are somewhat enmeshed, what remains clear from the systematic review presented in chapter two, is that the vast majority of past research fails to assess if and how an individual’s self-reported reasons for drinking differ systematically according to the context in which alcohol is consumed. Instead much of the existing research has treated drinking motives as stable, trait-like constructs—measured on a single occasion and assumed to hold true over multiple episodes of alcohol use. More recently, however, a group of studies utilising experience sampling techniques—whereby each participant’s reasons for drinking are measured across multiple drinking occasions—have begun to shed new light on this question of motive context-specificity (Arbeau et al., 2011; Kairouz, Gliksman, Demers, & Adlaf, 2002; Mihic et al., 2009). In this

chapter, the evidence originating from these studies is complemented by evidence from a wider literature—relating to adult populations, and theoretical frameworks that underpin alcohol use—forming a strong rationale for the further investigation of drinking motive context-specificity. In determining whether individuals may drink for consistently different reasons depending on aspects of the drinking context, it is first useful to explore whether individuals *use* of alcohol differs from one context to the next.

### **3.1 Alcohol Use is Context-Specific**

Evidence supports the view that alcohol consumption is itself a context specific phenomenon; anchored to some degree to the setting in which alcohol is consumed (Carey, 1993; M. L. Cooper, 1994; Demers et al., 2002; Harford, 1983; Kairouz et al., 2002; Kuntsche, Knibbe, et al., 2010; A. R. Mushquash, Sherry, Mackinnon, Mushquash, & Stewart, 2013; Nyaronga, Greenfield, & McDaniel, 2009; C. Stewart & Power, 2002). For example, Demers et al. (2002) used multilevel analysis of 26,348 drinking episodes, reported by 6,850 university students, to demonstrate that both environmental factors (such as the drinking circumstance, location, time of day, presence of food, social context ) and individual factors (such as gender, living arrangements, year of study, perception of drinking norms, average alcohol use, involvement in academic and recreational activities) contributed equally (51% and 49% respectively) to the explanation of individuals' alcohol use. Put another way, information about the drinking situation appears equally important as information relating to the individual characteristics of a person, in predicting the amount of alcohol that will be consumed on any given occasion.

Support for context-specific alcohol use is also provided by a number of other studies that have demonstrated that daily social and/or emotional events have a bearing on patterns of subsequent within-subject alcohol consumption (a comprehensive review

is provided by Mohr, Armeli, Tennen, & Todd, 2010). However, these mood-drinking relationships are complex, and appear to be dependent on the specific type of affect/mood in question, and on a number of other moderating factors. For example, in a study of moderate to heavy drinking adults, Swendsen et al. (2000) demonstrated that daily measures of nervousness (but not sadness, or negative affect more generally) were associated with increased alcohol use later the same day. In contrast however, in another adult sample, Mohr and colleagues (2005; cited in Mohr et al., 2010) reported no such finding for sad, bored or nervous moods but did find a positive association with angry, ashamed, guilty, and hostile moods. Furthermore, Steptoe and Wardle (1999) even reported a negative association between daily anxious mood and subsequent alcohol intake in adult sample of nurses and teachers, highlighting the inconsistent findings regarding mood-drinking associations.

Further, Mohr and colleagues have demonstrated in samples of adult (Mohr et al., 2001) and college students (Mohr et al., 2005), that the valence (positive or negative) of daily interpersonal experiences is related to context-specific alcohol use. In both studies, negative daily interpersonal experiences were only associated with solitary alcohol use (at home alone), whereas positive interpersonal experiences were only associated with subsequent alcohol use in the company of others (away from home). That is, people were found to drink with others more often following positive daily interactions, and by themselves in response to negative experiences. Similarly, a number of other studies confirm that the nature of mood-drinking relationships rely on a variety of moderating factors; including perceived social support, and timing of the drinking behaviour (Hussong, Hicks, Levy, & Curran, 2001; Todd, Armeli, & Tennen, 2009), and the location in which drinking takes place (Demers et al., 2002; Mohr et al., 2005).

In a recent study examining heavy episodic drinking reported by university students at three time points across 130 days, Mushquash and colleagues (A. R.

Mushquash et al., 2013) found that 57.3% of the variance was attributable to the ‘person’ and 41.3% was attributable to the ‘person by time point’. These findings indicate that while heavy episodic drinking has a large trait-like component, it also demonstrates considerable state-like variation (within each individual, from one time point to the next).

Taken as a whole, there exists good evidence, from between- and within-subject comparisons, to suggest that drinking itself operates in a context specific manner—with each individual’s pattern of consumption being somewhat dependent on aspects of the immediate drinking situation including the location, circumstance, affective state, and social setting, although the precise conditions governing these relationships remain somewhat unclear. While these studies demonstrate the importance of considering the situational drinking context associated with many predictors and outcomes of drinking behaviour, the literature review presented in the previous chapter clearly shows that drinking motives have not been studied to any great extent in this way. Furthermore, given that drinking motives represent well established and empirically supported structures with which to understand alcohol use (Kuntsche et al., 2005), it is logical to consider whether the motives underlying context-specific alcohol use may also be context-specific.

### **3.2 The Uncertain role of Drinking Motives in Context-Specific Alcohol Use**

In a replication and extension of the research by Demers et al. (2002) cited above, Kairouz et al. (2002) replicated the finding of context-specific alcohol use—episodic alcohol use was explained equally by differences between drinking episodes as differences between individuals. However, unlike Demers et al. (2002), one of the factors used by Kairouz et al. (2002) to assess differences between drinking episodes was episode-specific reasons for drinking. Specifically, the stated reasons for drinking were obtained in reference to *each drinking occasion*, thus representing a situated

measure of drinking motivation. Indeed, these situated reasons for drinking explained an additional 8.3% of the variance in alcohol use between individuals, but more importantly, also explained an additional 8.1% of the variance in use between drinking occasions, compared to a model that included environmental variables (such as drinking circumstance, location, day of the week, group size, type of relationship) and individual variables (relating to stable aspects of the university life experience) alone. These findings suggest not only that reasons for drinking act as predictors of inter-individual variation in context-specific alcohol use (i.e., the traditional trait-like conceptualisation of motives), but that fluctuating reasons for drinking within the same individual (situation specific drinking motives) also, and uniquely, predict alcohol use from one moment to the next. Stated differently, when measured repeatedly, drinking reasons help to explain (i) why one person may drink more than another, and (ii) why one person may drink more on one occasion compared to another.

Kairouz et al. (2002) explain the finding— that situated drinking reasons predict patterns of context specific drinking—by arguing that the reasons why people drink are anchored to the situation surrounding each drinking episode, and vary depending on the context in which alcohol is consumed (i.e., that they are context-specific). Whilst this interpretation is indeed possible, according to the predominant trait-like conceptualisation of drinking motivation popularised by M. L. Cooper (1994), this finding may alternatively be interpreted as a *situation* by *trait motive* interaction. More specifically, rather than motives being considered as context-specific, a trait-like conceptualisation of drinking motives would suggest that situation-drinking relationships are *moderated* by (stable) drinking motives. For example, in her seminal US study of adolescent drinking behaviour, Cooper (1994) found, using a between-group study design, that each of the four drinking motives of the DMQ-R was associated with a unique pattern of context-dependent alcohol use. Cooper

conceptualised these findings in terms of an interactional relationship between (stable) drinking motives and context variables, that combine to produce unique patterns of drinking behaviour. That is, people who are motivated to drink for a particular set of reasons, consume alcohol in a way that is also dependent on the drinking situation—for example, an individual who is motivated to drink for social reasons may drink more at a party than at home alone but remain equally socially motivated in each circumstance. Clearly, under this conceptualisation, drinking motives themselves are considered relatively stable from one situation to the next (e.g. the socially motivated drinker remains a socially motivated drinker irrespective of the drinking context), however motives *express themselves* differently depending on the situation (i.e., the socially motivated individual may consume more alcohol when at a party than at home alone). Studies that measure drinking motives in a de-contextualised way (i.e., 98% of the studies under review in the previous chapter) implicitly assume that drinking motives are relatively stable sets of cognitions, unaffected by context. However, as has been raised by the findings of Kairouz et al. (2002), and will become increasingly apparent, this assumption may not be empirically or theoretically justified.

### **3.3 The Case for Situated Drinking Motives**

As outlined in the previous section, past research indicates that the reasons why individuals (adults and young people) drink are associated with context specific alcohol use. That is, people who drink for similar reasons are likely to drink in circumstances and environments that are also alike. While the traditional explanation of these findings, has been an interaction between each individual's stable (trait-like) drinking motives with aspects of the drinking environment, more recently, authors have hypothesised that individuals' drinking motives themselves vary in predictable, context-specific ways (Arbeau et al., 2011; Kairouz et al., 2002; Mihic et al., 2009; Mohr et al., 2005; Mohr et al., 2013). This new approach posits that individuals' drink for meaningfully different

reasons from one drinking setting to another. Both trait-like and context-specific conceptualisations are conceivable, however the remainder of this chapter details the empirical and theoretical evidence to suggest that that a context-specific conceptualisation of drinking motives is most probable, or at the very least, deserving of further testing and investigation.

**3.3.1 Evidence from empirical studies.** In determining whether an individual's reasons for drinking vary situationally, it is useful to examine the findings of the few existing studies that have taken within-subjects measures of drinking motives across multiple drinking episodes/contexts. While a number of studies, have obtained repeated measures of each individual's drinking motives across multiple time points, most have been concerned with establishing the short-term stability or longer-term developmental trajectories of drinking motives, and do not give consideration to changes in situational factors between measures. (e.g., Kuntsche & Gmel, 2006; Littlefield et al., 2010; Patrick & Schulenberg, 2011; Schelleman-Offermans et al., 2011). These measures have been framed in terms of traits, using anchors such as "in general" rather than in a context specific way such as "why did you drink in this specific situation". To my knowledge, Kairouz and colleagues (2002) were the first to consider participants' different reasons for drinking across multiple drinking situations, and achieved this using experience sampling methods.

As touched upon in section 3.2 above, Kairouz and colleagues' (2002) study found that the reasons given by college students for drinking on separate drinking occasions (i.e., *situated* drinking reasons), explained an additional 8.1% of the variation in alcohol intake observed between drinking episodes, compared to a baseline model that considered the influence of a variety of immediate (e.g. day of the week, drinking location and circumstance) and more stable (e.g. type of residence, perception of drinking norms) contextual variables. This study is important as it demonstrated for the

first time that *situated* reasons for drinking help to explain the way individuals' alcohol use fluctuates between drinking episodes (over and above that explained by a number of other contextual variables). However, whilst the authors argue that a context-specific conceptualisation of drinking motives presents the most compelling explanation of these findings, it is true that the traditional trait-like conceptualisation of reasons is also consistent with these findings. Specifically, if reasons for drinking represent stable traits that interact with features of the drinking environment (i.e., the traditionally held explanation of context-specific alcohol use), we would expect drinking reasons measured situationally to accurately reflect these underlying trait-like motives, and hence still contribute to the explanation of context-specific alcohol use.

Clearly, Kairouz et al.'s (2002) study falls short of empirically testing whether the reasons given by participants for drinking across multiple episodes are dependent on features of the immediate drinking context, nor does it detail the manner in which specific situated drinking reasons are associated with varying patterns of alcohol consumption. Nonetheless, Kairouz et al. (2002) championed a context-specific conceptualisation of drinking motives as a most likely explanation of their findings, and highlighted potential benefit for continued research to test this notion.

Some new insights into the relationship between context and drinking motives are provided by Mihic et al. (2009), in their study of alcohol related aggression in 4336 Canadian students. Mihic et al. (2009) employed a similar research design to Kairouz et al. (2002)—obtaining within-subject measures of each student's predominant drinking motivation on three prior occasions. However, Mihic et al. (2009) also constructed a measure of respondent-level (trait-like) drinking motivation—the most frequent motive endorsed by each individual across all drinking episodes. Mihic et al. (2009) used hierarchical multilevel linear modelling techniques to explore the extent that these

situational and trait-like measures of drinking motives explained the likelihood of being involved in episodes of alcohol-related aggression.

Importantly, their results demonstrated that situation-level (episodic) coping drinking motives predicted involvement in alcohol-related aggression beyond that predicted by respondent-level (averaged across drinking episodes) coping motives—in a model that also accounted for a variety of other situational variables (e.g., number of drinks consumed, drinking location and circumstance, presence of a partner) and respondent-level variables (e.g., average alcohol consumption, gender, age, perception of peer drinking norms). Mihic et al. (2009) further demonstrated that the extent to which situational- and respondent-level motives were important in predicting risk for alcohol-related aggression depended on the particular drinking motive in question. Whilst drinking to cope, when measured situationally, was found to be important in uniquely predicting alcohol-related aggression, this was not the case for enhancement drinking motivation—where respondent-level measures better predicted cases of aggression.

Notwithstanding this variability between motives, Mihic et al.'s (2009) finding that situated motives can contribute uniquely to the prediction of alcohol related outcomes, beyond that already provided by measures of average drinking motives, is entirely consistent with a context-specific conceptualisation of drinking motives. Clearly, if individuals drink for different reasons according to the drinking context, then we would expect situated drinking motives to explain variance in alcohol-related outcomes additional to that explained by motives measured more generally. Conversely, if drinking motives are trait-like, then situated motives should add nothing further to the prediction of alcohol-related outcomes already gained by general measures of drinking motives. Again, this research contributes additional, albeit indirect, support for the notion of context-specific drinking motives, but falls short of directly assessing if and

how certain aspects of the immediate drinking situation are associated with drinking motive endorsement. Additionally, the studies reviewed up to this point have only investigated the context specificity of *reasons* for drinking, and not of existing, and well accepted multi-dimensional measures of drinking *motives*, such as the DMQ-R. This research gap is partially addressed by the following study.

A final experience sampling study, by Arbeau et al. (2011), informs the present critique of the empirical evidence regarding the context-specificity of drinking motives. Arbeau and colleagues measured the trait-like (general) enhancement and coping drinking motivation of 81 Canadian students using the DMQ-R, but also obtained daily diary measures of each individual's level of coping and enhancement motivation specific to all drinking episodes over a period of 14-days. With the aim of examining motive specificity in daily drinking, the authors predicted that three between-participant (i.e., trait-like) variables (sensation seeking, conscientiousness, trait -coping and -enhancement motivation) and four within-participant variables (i.e., that varied within participants from day to day) would explain variations in daily coping and enhancement drinking motives. Importantly, unlike the studies described above, that focused on outcome measures of daily drinking (Kairouz et al., 2002) and alcohol-related aggression (Mihic et al., 2009), the outcomes of interest to Arbeau and colleagues (2011) were daily drinking *motives* themselves—thus providing a more direct test of context-specificity of drinking motives.

Significantly, Arbeau et al. (2011) found that a substantial proportion of the observed variance in daily enhancement and coping drinking motives (35.98% and 25.75% respectively) was explained by situational variables (daily affect, task accomplishment, day of the week), suggesting that daily drinking motives are indeed, at least partially, situation specific in nature. Daily enhancement drinking motivation was predicted by trait-enhancement drinking motivation, trait sensation seeking, and daily

positive affect—indicating, among other things, that individuals were more likely to drink for enhancement reasons on days when they felt good. Conversely, daily coping drinking motivation was predicted by trait-coping drinking motivation and negative daily affect—indicating that individuals ‘drank to cope’ more on days characterised by negative feelings. In summary, each individual’s daily mood represented a contextual variable that uniquely predicted within participant variation in coping and enhancement drinking motivation.

Furthermore, while daily task accomplishment was positively related to enhancement motivation generally, this relationship was moderated by ‘level two’ (i.e., trait-like), variables. Specifically, while daily task accomplishment associated with increased enhancement motivation, this relationship was stronger for those high (compared to low) in conscientiousness and sensation seeking. The authors surmised that both of these personality traits (sensation seeking and conscientiousness) may predispose an individual towards drinking to celebrate/get drunk on days when they have been particularly productive. Similarly, Arbeau and colleagues found that those high (compared to low) in trait conscientiousness were more likely to ‘drink to cope’ on days of high task accomplishment—perhaps indicating a form of post-labour tension-reduction, or ‘a drink to unwind after a busy day’. Additionally, the link between daily negative affect and daily coping drinking motivation was strengthened by an individual’s trait-coping drinking motivation—such that those who rarely drank to cope were relatively unaffected by daily negative affect.

These findings by Arbeau et al. (2011), demonstrate not only that situational variables can influence individuals’ daily drinking motives directly—providing support for context-specific motives—but also that level-two (trait-like) variables can influence these relations between situations and drinking motivations (and alcohol use). To express this another way, aspects of the drinking context appear to hold different

meanings for different people. For one person, the end of a particularly productive day may be cause for a celebratory or relaxing drink, whereas for another person it may present no additional reason to drink. Another example of this is that conscientiousness appears to influence the meaning evoked by a given situation—with those high in conscientiousness more likely to interpret a productive week as a reason to celebrate or relax compared to less conscientious people, for whom task accomplishment may hold little, or a different, meaning. The authors suggest that this study supports the view that drinking motives are mostly trait-like, but also have a context-specific component—a conceptualisation that is enabled by the multi-level analytical techniques used—and goes some way to explaining how aspects of the daily environment (affect and task accomplishment specifically) are related to daily drinking motives.

Recently, further evidence of contextual variability in drinking motives has been provided by Arterberry, Martens, Cadigan, and Smith (2012) in a study that assessed the dependability of the DMQ-R based on three repeated measurements 6 months apart. Even though motives were measured in a generalised way (i.e., “thinking of all the times you drink alcohol ....”) a substantial proportion of variation observed in motive endorsement between time points (ranging from 30% to 19%) was within subjects—highlighting contextual variation, and/or error.

What is still lacking, however, is a clear test of whether drinking motives are better conceptualised and measured as context-specific or trait-like constructs, and whether broader aspects of the immediate drinking context (such as the drinking location, drinking circumstance and social setting) influence individuals’ reasons for drinking from one situation to the next, in ways that are meaningful and important. For example, it is entirely possible that an individual (or indeed groups of individuals) may be motivated to drink for different reasons (and thus consume alcohol in a different way) depending on who they are drinking with (e.g. friends, relatives, alone), where

they are drinking (at home, bar, night club), their mood (positive, negative), and their circumstance (party, celebration, wedding). The research critiqued above also points towards the likelihood that individuals will interpret and respond to each of these situations somewhat differently, and raises the possibility that these individual differences may be explained by trait-like factors (such as personality traits and other individual difference variables). Given that these context-specific relationships remain largely unexplored within the drinking motive literature, a refined conceptualisation of drinking motives has the potential to open novel lines of enquiry that may lead to a more precise, nuanced and useful understanding of young adults' drinking behaviour.

To summarise the argument presented in this section, a number of studies have established that individuals (both young and old) consume alcohol differently depending on the drinking context—that alcohol use itself is context specific. A study by Kairouz et al. (2002), marked a significant development in the literature, by measuring students' specific *reasons* for drinking across various occasions (rather than in general, as had been the norm). Kairouz and colleagues' finding that these within-subjects measures of drinking reasons helped to explain situation-specific alcohol use were consistent with the idea that drinking motives themselves are context dependent, and sparked further investigation of within-subjects, and not just between-subjects, variation in drinking motives.

Following this line of reasoning, Mihic et al. (2009) assessed the extent to which within-subjects (situational), and between-subjects (trait-like) measures of students' reasons for drinking predicted their risk of involvement in alcohol-related aggression. Their finding that situational coping related reasons for drinking added to the prediction of alcohol-related aggression beyond that already contributed by trait-like measures of coping motivation suggests that, with regard to coping motivation at least, situational

variation in drinking motivation helps to explain alcohol-related outcomes. Put more simply, context specific reasons for drinking

The most direct empirical support for a context-specific conceptualisation of drinking motives is provided by Arbeau et al. (2011) in their daily process study of motive specificity. They demonstrated that situational variables, such as daily mood and task accomplishment, were directly associated with daily measures of enhancement and coping drinking motives, and furthermore, that trait variables (conscientiousness and sensation seeking) moderate the influence of the situation on daily drinking motives in certain circumstances.

Therefore, although these studies provide tentative support for a context-specific conceptualisation of drinking motives, there still remains a general lack of empirical evidence to conclude that this conceptualisation is superior to the traditionally held view of drinking motives as trait-like. Additionally, a scarcity of research has investigated the role that characteristics of the immediate drinking context (such as the drinking location, drinking circumstance, and social setting) may play in shaping individuals' specific reasons for drinking, or how these may differ from one person to the next according to individual difference variables (such as personality).

**3.3.2 Evidence arising from theory.** In addition to the findings discussed above, further evidence in support of context-specific motives is provided by the theoretical frameworks that underpin drinking motives research themselves. I first consider how Cox and Klinger's preeminent motivational framework (Cox & Klinger, 1988, 2004b) describes the role of contextual factors in shaping drinking motives. An argument is made that whilst the core premise of context-specific drinking motives is compatible with Cox and Klinger's original model, subsequent research has failed to embrace this view. Following this, evidence arising from the social-cognitive theoretical tradition is presented as a further explanation of the potential mechanism explaining

drinking motive specificity. The significant research implications of this new line of evidence are then explored.

**3.3.2.1 Motivational model of alcohol use.** As highlighted briefly in chapter one (section 1.3.2), the motivational model of alcohol use (Cox & Klinger, 1988, 2004b) identifies a group of *proximal determinants* (or *current factors*) that are said to influence the decisional process underlying an individual's motivation to consume alcohol, in any given situation. The central tenant of the model is that individuals' motivation to drink (or abstain from drinking) is based on the extent to which they expect drinking (or abstaining) will bring them closer to achieving valued goals and, in doing so, improve their affect. Regarding situational context, Cox and Klinger (2004b) argue that specific aspects of the immediate drinking context, such as the physical setting, the social setting, availability of alcohol, and the extent to which drinking is encouraged or discouraged, exert their influence on drinking motives by directly shaping the incentive structures surrounding both alcohol use, and alternative (non-alcohol related) behaviours. That is, drinking is considered by individuals to be rewarding for different reasons, and to varying extents, depending (in part) on the context in which the drinking takes place. To provide a concrete example; while Graham's goal—to find a partner—may not change in itself across situations, his motivation to drink in service of this goal is likely to be greater when he is amongst mixed-sex peers compared to family members, and when at a party compared to a restaurant—assuming, of course, that he believes that alcohol will help rather than hinder his chances of finding a partner.

While Cox and Klinger's motivational model of alcohol use goes some way in explaining context-specific drinking motives, it should be noted that the notion of context-specific motives remains somewhat implicit in their writings (1988, 2004b). Indeed, although acknowledgement is made of the potential influence of situational

factors, little attention is given to describing or predicting different patterns of drinking motives across various contexts, nor to the potential implications of context-specific drinking motives for research and practice. Equally, with a few notable exceptions (e.g., Arbeau et al., 2011; Kairouz et al., 2002; Mihic et al., 2009; Mohr et al., 2013), this is true also for subsequent theoretical writings on drinking motivation. For example, while Cooper, Frone, Russell, and Mudar (1995) briefly acknowledge the theoretical value of conceptualising motives as context-dependent; stating that “it may be more useful to view coping and enhancement drinking as situationally activated processes in which individuals drink for one reason or the other depending on the character of the situation” (p. 1003), what is clear from the review presented in chapter two is that the overwhelming majority of studies by these and other authors continue to use methods that de-contextualise drinking motives, and offer explanations for context-specific alcohol-related outcomes based on *interactions* between trait-like motives and context variables (M. L. Cooper, 1994; M. L. Cooper et al., 1995; Kuntsche et al., 2005, 2006d).

A relevant example of this kind of interactionist position is provided by Mushquash and colleagues (2013) who found evidence that heavy episodic drinking varies as a function of both the person and the situation (i.e., via a significant person by situation interaction). Based on this finding, they argue that heavy episodic drinking can be described as a ‘trait-state’; a trait-like tendency to drink in a risky way, that is expressed differently depending on the situation. Clearly, it is possible that drinking motives operate in a similar way (an interaction between a trait-like motive and the situation), rather than being truly context-specific (varying from one situation to the next).

Given the lack of traction Cox and Klinger’s (1988, 2004) implicitly stated rationale of context-specific drinking motives has received within the literature to date, there is value in exploring other theoretical explanations. The social-cognitive

perspective provides a particularly promising framework from which to understand the context-specific drinking motives.

**3.3.2.2 A Social-Cognitive conceptualisation of context specific drinking and drinking motives.** Social-Cognitive Theory (SCT; Bandura, 1986) is a useful and widely accepted theoretical framework of personality, learning and behaviour, that can inform the under-researched relationship between *where* and *why* people drink. Indeed, as was outlined in chapter one (section 1.3, p.5), The SCT represents a foundational perspective from which motivational theory arises. In broad terms, SCT explains how thoughts, knowledge, social experience and situational factors interact to predict stable patterns of human behaviour. Within the general drinking literature, a number variables central to SCT have received investigation—including outcome expectancies (Goldman, Del Boca, & Darkes, 1999; Hittner, 1997), self-efficacy (Dijkstra, Sweeney, & Gebhardt, 2001), affect (Mohr et al., 2005; Mohr et al., 2013), goals (Lecci, MacLean, & Croteau, 2002) and social context (Christiansen, Vik, & Jarchow, 2002). As such, SCT represents a well recognised and useful theoretical perspective informing a contemporary understanding drinking behaviour.

Couched in SCT, the work of Walter Mischel (2004; Mischel, Mendoza-Denton, & Shoda, 2002; Mischel & Shoda, 2010) in the area of personality (or behavioural consistency) is of particular relevance to understanding how and why drinking behaviour and motives may vary from one drinking situation to the next. Traditionally, behavioural consistency has been measured by taking an average score of the dimension of interest across a variety of situations (Costa & McCrae, 2008; Eysenck, 1970)—a manner that parallels the majority of drinking motivation research. However, driven by accumulating evidence that each individual's behaviour varies somewhat *predictably* from one situation to the next (consistent within contexts but variable across them), Mischel and colleagues proposed an alternate way of examining individual consistency

(Mischel & Peake, 1982; Mischel & Shoda, 1995, 2010). Rather than treating intra-individual variation in behaviour as ‘error’ or ‘noise’, thought simply to distract from the underlying general disposition or trait of interest, Mischel and colleagues argued that much of this intra-individual variability could be explained by considering the context in which the behaviour took place. By analysing behaviours within context, Mischel found evidence of stable and meaningful patterns of situation-behaviour relations he termed *if...then...* (if situation A, then the person does X, but if situation B, then the person does Y) *personality signatures*. For example, in a study of children attending a Summer camp, Shoda, Mischel, and Wright (1994) observed that one student consistently acted aggressively when warned by adults and less aggressively when approached positively by peers, however for another student the opposite pattern of context specific behaviour was observed. In this instance, a simple aggregate of each student’s aggression across all situations conceals the stable (and unique) patterns of behaviour. Indeed, Mischel, and many since, have argued persuasively, on both theoretical and empirical grounds, that situation-behaviour profiles better explain individual differences in behaviour than trait-like (de-contextualised) measures (a comprehensive review is provided by Mesquita, Barrett, & Smith, 2010). Clearly, this theoretical shift, from a trait-like conceptualisation of behavioural consistency to a context-specific one has the potential to significantly improve our understanding of all human behaviour, including alcohol use.

Indeed, the recent study by Mohr et al. (2013) provides the first direct test of Mischel’s notion of *if... then...* personality signatures in reference to alcohol use. The researchers analysed the daily mood and alcohol consumption of 47 moderate drinking adults, to examine how each individual’s daily mood (the ‘*if*’ factors) related to their level of solitary and group drinking (the ‘*then*’ factors). Consequently, each participant’s mood-drinking relationships were used as a measure of their *if...then...*

*drinking signatures*. Mohr and colleagues found great individual variation in these if...then... drinking signatures, and additionally found that these differences predicted a number of alcohol related outcomes, as measured 12 months later. Consistent with that predicted, individuals with strong positive-mood—group-drinking relationships had more alcohol-related problems and stronger enhancement motivation at follow-up, while those who displayed strong negative-mood—group-drinking relationships were likely to have weaker enhancement motivation. Indeed, while this study by Mohr and colleagues supports the notion of *if...then... drinking signatures*, it also raises the question of whether a similar *if...then...* process also relates to the *motives* underlying drinking behaviour. By examining in more detail the theory outlined by Mischel and Shoda relating to if...then... profiles, it becomes clear below that there is good reason to believe that this may indeed be the case.

Mischel and Shoda offer the Cognitive-Affective Processing System, or CAPS, as a framework for explaining if... then... signatures (Mischel & Shoda, 1995). Central to this framework is the belief that all human behaviour is driven by the activation of underlying schemas, cognitive frameworks and affects—termed *cognitive-affective units*, or CAUs. Examples of these include an individual's construal of the self, others, environment, expectations, goals, beliefs, plans and emotions—and a case can be made that *motives*, with their clear cognitive and affective aspects, can also be considered a type of CAU. Mischel and Shoda argue that features of situations activate relevant CAUs based on the individual's past interactions and experiences with those features. For example, parties may be associated with notions of fun and enjoyment for some, anxiety for others, and perhaps boredom for a third group, based on a range of past experiences. If drinking motives can indeed be accurately conceptualised as CAUs—then the CAPS model would predict stable patterns of intra-individual drinking motive activation that is context-specific.

Additionally, according to the CAPS model, CAUs do not exist in isolation, but rather form stable interconnected networks, analogous to neural network models of the brain (Mischel & Shoda, 1995). This connectionist model predicts not only that cognitions and affects can be triggered by situational factors (such as the presence of friends at a party triggering happiness), but also that inter-related CAUs can activate each other (e.g., happiness may trigger enhancement drinking motivation, as well as other relevant CAUs, in some individuals). This process, whereby situational features influence behaviour via the selective activation of cognitions and affects, accounts for complex yet coherent patterns of context-specific behaviour. Importantly, the CAPS model also accounts for individual differences in behaviour via two mechanisms: a) differences in individuals' chronic accessibility of CAUs in response to various situational features, and b) differences in the organisation of relationships between CAUs.

While external features of the situation are important for finding consistency in intra-individual behavioural variation, the CAPS model suggests that the truly influential features (or *active ingredients*) of a situation are psychological. Further, given that individuals' reasons for drinking appear to be closely related to their alcohol use (see chapter two) it seems logical that drinking motives may represent CAUs (an amalgam of thoughts and feelings) of primary importance. The CAPS model provides a theoretical rationale for expecting that features of the drinking situation may activate various drinking motivations, and that these stable patterns of activation may differ from one individual to the next. Further, the model provides reason to believe that context-specific motives may be better able to explain systematic variation in alcohol related outcomes than motives or context variables either in isolation, or as the result of a simple interaction effect.

### 3.4 Summary

There is strong evidence to suggest that drinking behaviours themselves are context specific (Carey, 1993; M. L. Cooper, 1994; Demers et al., 2002; Harford, 1983; Kairouz et al., 2002; Kuntsche, Knibbe, et al., 2010; Nyaronga et al., 2009; C. Stewart & Power, 2002). This has been succinctly demonstrated by Demers and colleagues (2002), and replicated by others (Kairouz et al., 2002; Kairouz & Greenfield, 2007), by the finding that information about the drinking situation appears equally important as information relating to the individual characteristics of a person, in predicting the amount of alcohol consumed. One explanation for the context-dependent nature of alcohol use is that the *motives* underlying the behaviour also operate in context-specific ways—as is somewhat implicitly stated in Cox and Klinger’s (1988, 2004b) motivational model of alcohol use, and consistent with the theory explaining *if..then.. personality signatures* proposed by Mischel and Shoda’s (1995).

However, while a context-specific conceptualisation of drinking motives presents one explanation of these findings, Cooper (1994) argues that motives are trait-like in nature, and simply express themselves differently depending on the situation (an alternative explanation of context-specific alcohol use). In evaluating these two explanations, a number of daily process studies—based on multiple measures of participants’ reasons for drinking—provide some insight (Arbeau et al., 2011; Kairouz et al., 2002; Mihic et al., 2009). While the findings of these studies are consistent with a context-specific conceptualisation of drinking motives, the two conceptualisations (context-specific versus trait-like) have not been directly compared. Additionally, there is an absence of research investigating the role that characteristics of the immediate drinking context (such as the drinking location, drinking circumstance, and social setting) play with regard to situational measures of drinking motives (Kuntsche et al., 2006d). Finally, to date no research has examined the role context plays with in relation

to all four of the drinking motives assessed by Cooper's DMQ-R (1994). Given the popularity and utility of this measure, great potential value exists in doing so.

### **3.5 The Current Research Thesis**

Based on the research gaps identified above, the current thesis aimed to directly test and explore this notion of context-specific drinking motives via three interrelated studies. This was achieved by addressing two broad aims: (i) to assess whether the self-reported drinking motives of young adults operate in a truly context-specific way, and if so (ii) to explore the utility of conceptualising and measuring drinking motives in this way. Given the lack of existing research and knowledge regarding the context-specificity of drinking motives, an important first step in the current investigation was to explore how various aspects of the drinking situation may influence the reasons why individuals consume alcohol. In doing so, a number of meaningfully different situations in which young people may be expected to drink for different reasons can be identified, and utilised in the further exploration of context-specific drinking motives.

## **Chapter Four: Identification of Meaningfully Different Drinking Contexts**

This chapter reports the findings of the first of three empirical studies examining the context-specificity of individuals' drinking motives in an explicit and unique way. Drawing upon the interview responses given by ten undergraduate university students, this initial qualitative study provides a preliminary exploration of *if* and *how* students consume alcohol for different reasons depending on aspects of the environment in which they drink. An important aim of this study is the identification of meaningfully different drinking contexts for which intra-individual drinking motives are expected to differ—thus supporting additional (quantitative) analyses of context-specific drinking motives in the two studies that follow (chapters five and six). The present study is required, as little is currently known regarding *how* (or indeed *which*) features of the drinking context may (i) motivate young adults to drink for different reasons, (ii) influence patterns of alcohol use and harm.

### **4.1 Study One – Qualitative Examination of Meaningful Drinking Contexts**

The current qualitative study aimed to (i) examine *if* and *how* young adults consume alcohol for different reasons depending on aspects of the drinking context; (i) identify a number of drinking contexts most likely to be associated with divergent reasons for drinking and, (iii) to provide an initial exploration of the potential relationships between context-specific drinking motives and alcohol use and alcohol related harm. This study is important, as it provides a preliminary understanding of the context-specificity of young adult's drinking motives, and enables a more sophisticated investigation of the validity and utility of conceptualising drinking motives as context specific in subsequent studies.

#### **4.1.1 Method.**

**4.1.1.1 Participants.** Participants were ten psychology students (7 female, 3 male), recruited from a large Australian university. Eight were undergraduate students and two were studying at a post-graduate level. Each student participated in one of five face-to-face interviews, comprising of one to three participants. While interviews were scheduled to have two or three participants present, on some occasions participants did not turn up. As a result, one of the interviews was conducted individually. Ages of participants ranged from 19 to 25 years.

**4.1.1.2 Materials and Procedure.** Approval was sought and gained through the Deakin University Human Research Ethics Committee prior to the commencement of the study. Participants were recruited via online posts on undergraduate and postgraduate psychology noticeboards. Interested individuals were provided with a Plain Language Statement—that briefly outlined the nature of the study—and were given the opportunity to provide informed consent. The five resulting interviews were conducted on campus and ranged from 20 to 40 minutes in length. In order to elicit responses pertinent to the aims of the research, the interview format was semi-structured, consisting of open-ended questions designed to elicit narratives of people's experience of alcohol use across multiple drinking situations. The five interviews followed the same basic format.

Participants were first invited to spend five minutes writing down, and then sharing with the group, the most common situations in which they drink alcohol. Open questioning then followed to draw out each participant's experience of drinking in each of the situations they identified. Of particular interest, were themes relating to a) their reasons for drinking, b) the type of drinking undertaken, c) the consequences associated with drinking experienced, and d) the features of the drinking situation that may have influenced each of these factors. In order to direct the conversation towards the more

specific topics of interest students were asked to “Describe in as much detail as possible the situations, and circumstances where you most commonly drink alcohol?”.

Participants were also asked “Why do you drink in these situations?”, and later in the discussion they were asked “What are some of the consequences, either positive or negative, that you have experienced as a result of drinking?”. Following each of these questions, a number of unscripted probes were used to encourage participants to elaborate, or clarify their responses. Each conversation was permitted to take a natural direction, and topics were covered in no specific order.

The researcher made notes after each interview in order to gain a preliminary understanding of the themes discussed during the process of conducting interviews. Interviews were also audio recorded, with the exception of one due to equipment failure, and were transcribed verbatim for coding and analysis. All identifying information was removed or modified to ensure participant confidentiality.

**4.1.1.3 Data coding and analysis.** Each transcript was first read by the author to gain a preliminary understanding of each narrative and the context in which all comments were made. The transcripts were then coded and analysed using a thematic analysis technique described by (Joffe, 2012). In accordance with this technique, a coding frame was devised based on patterns of similar participant responses and influenced by past motivational theory. The reliability of the coding frame was established by having an independent coder code 25% of the transcripts independently. Any discrepancies in coding were discussed and revisions/clarifications were then made to the coding frame to ensure that it could be applied consistently.

To assist with the coding and analysis, transcripts were entered into the qualitative software package NVivo 9 (QSR International, Melbourne). All data were then coded by the author, using the revised coding frame. The software package was used to assist in the identification of high frequency themes, and to draw out theoretical

associations between themes via sorting and filtering techniques. Where possible, multiple interpretations of the data were explored and then tested for credibility via a re-reading of the original transcripts.

**4.1.2 Analysis and discussion.** This qualitative study aimed to (i) examine the hypothesis that young individuals' drink for consistently different reasons depending on relevant features of the drinking situation, (ii) identify a number of meaningfully different drinking contexts for which individuals' reasons for drinking would be most likely to differ from one drinking episode to the next; and (iii) explore *if* and *how* this hypothesised variation in individuals' reasons for drinking across contexts indeed influences their patterns of alcohol use and exposure to alcohol-related harms.

In addressing these three aims, the findings of this study are reported in the following manner. The first two sections outline and discuss the general (non-context specific) findings regarding the nature of participants' reported drinking motives and alcohol related consequences—and these findings are contrasted with past research. This provides a solid background understanding of why and to what effect the members of the current sample consume alcohol, and to what extent they differ from previous samples. Having identified the general reasons why the participants consume alcohol, and the harmful consequences they are typically exposed to whilst drinking, the remainder of the chapter provides a detailed investigation into the nature and influence of aspects of the immediate drinking context. Important features of the drinking context are categorised into four broad groups—1) features of self, 2) features of the physical environment, 3) features of the social environment and 4) timing of the drinking opportunity—and each is discussed in relation to individuals' reasons for drinking and reported exposure to alcohol-related consequences.

**4.1.2.1 Drinking motives.** All participants reported having some decisional control over their drinking behaviour, and generally responded easily and confidently

when questioned about their reasons for drinking. Despite the ease in which participants reported them, many of the reasons they described were complex and highly nuanced in nature—contingent on the interplay of multiple factors. Commonly identified reasons for drinking included ‘to become less inhibited/more confident’, ‘to be social’, ‘to reduce social anxiety’, ‘to have fun’, ‘to enhance emotions or experience’, ‘to relax’, ‘to detach from stressors/worries’, ‘to get drunk’, and ‘to fit in with others’ expectations or social norms’. A cursory inspection of these reasons reveals that, when grouped into higher-order categories, they map well onto the four motive classes proposed by Cooper (1994); *social* (to become less inhibited/ more confident, to be social), *enhancement* (to have fun, to enhance emotions or experience), *coping* (to relax, to detach from stressors/worries, to get drunk) and *conformity* (to fit in with others expectations or social norms). Further, the relative frequency of the drinking motives reported by the current sample was also consistent with past findings (for example M. L. Cooper, 1994; Kuntsche et al., 2005; Mohr et al., 2005) with enhancement and social motives found to be most commonly reported (29% and 34% respectively), followed by coping (25%) and conformity motives (9%). Only 4% of the reasons given by participants could not neatly be categorised into one of these traditional motive dimensions, as they related to aspects of habitual drinking.

Notwithstanding this, a number of difficulties arose when attempting to categorise the various reasons given by participants for drinking into discrete, higher-order motives. Such difficulties were primarily the result of the ambiguous nature of participants’ explanations for drinking, such that multiple motives could be implied depending on interpretation. This difficulty is illustrated well by the following quote from Sally regarding her desire to drink to relax.

*“I feel more relaxed, you feel like . . . [it’s] a closure to a hard day, and you can enjoy something and sit back and relax and talk with family. It gets conversations happening.” (Sally, 21)*

In this one passage, drinking to relax has been used by Sally to describe; taking her mind off challenging life events (a coping-type motivation), with improving social interactions (a social-type motivation), and arguably to increase her enjoyment (an enhancement-type motivation). A further example of the ambiguity surrounding drinking ‘to relax’ is provided by Fiona, who’s comment below can be construed as reflecting a conformity motive equally well as a coping motive.

*“... I think it’s [the reason for drinking], also that you’ve just got something in your hand and . . . you’re doing something, not just standing there. Just makes it a bit more relaxing . . . Even if you’re not drinking, I’ll get a drink of water and just be like – I’m part of the group now.” (Fiona, 19)*

Unsurprisingly, this type of ambiguity was not limited to ‘drinking to relax’, indeed most reasons for drinking given by participants could be interpreted as a reflection of multiple underlying motives. In each case, consideration of the broader context surrounding each reason was required to come to a faithful estimation of the goal(s) and motive(s) underlying each comment. It is worth noting that while some reasons were difficult to classify within a specific motive, this difficulty arose not because a reason would not adequately fit a motive, but rather because a reason seemed to fit multiple motives. It has been noted in chapter one and elsewhere (Kuntsche et al., 2005) that this type of ambiguity represents a significant challenge to the internal validity of many measures of drinking motives, including the well established DMQ-R (M. L. Cooper, 1994).

Having interrogated the many instances whereby ambiguity of this kind occurred in the data, a number of potential reasons for the overlap can be surmised. First, it is possible that participants held simultaneous motives and consequently used language that accurately described this mixed motive state. Second, participants’ underlying motive structure (proposed by Cox and Klinger, 1988; and furthered by Cooper, 1994) reflects overlapping rather than discrete dimensions.

**4.1.2.2 Alcohol use and related harms.** Participants' general level of alcohol use and alcohol-related harms (across all drinking occasions), although not the primary focus of the present study, provide an interesting comparison to past studies. As is typically found in young adult populations (e.g., Baer, 2002), participants displayed a wide range of drinking behaviours. However, the present sample reflects a somewhat restricted range of alcohol use (ranging from frequent binge drinking to moderately frequent light drinking) when compared to past studies that typically report a greater proportion of very low use drinkers (Australian Institute of Health and Welfare, 2008). The recruitment process (that excluded non-drinkers and invited participants to share their reasons for drinking) may have dissuaded light drinkers from participation. Consistent with past findings (for example, C. Park, 2004), binge drinking was commonly reported by participants, and was associated with a number of harmful consequences. The harms identified included 'feeling sick/hungover', 'causing arguments', 'becoming over emotional', 'causing an accident/injury', 'memory loss/blackouts', 'regrettable/embarrassing/uncharacteristic actions', 'harming relationships', 'the financial cost', and 'having to look after an intoxicated friend'.

Participants frequently reported experiencing positive consequences, and these often mirrored their commonly stated motivations for drinking: "I feel like I get along well with people and just feel happier", "I feel elation and that sort of solidarity with my friends", "relaxed, happy, confident, entertaining", "hornier", and at times "rebellious . . . which feels positive". The nature of positive consequences described by participants also depended on the level of alcohol consumed:

*"It starts off as like a social thing at home, and let's say a person's span of drink is ten. . . they need between 2 to 7 to socialise, and then that 7 to 10 period is like that little dance period, that's where the club comes in." (Frank, 20)*

Within the social domain, Frank's comment suggests that the ability to interact verbally with others is enhanced when drinking initially, and that as more alcohol is

consumed non-verbal positive consequences become more predominant. Notice also, that Frank identifies two different drinking settings – at home, and at a club - associated with each of the consequences (and presumably the underlying reasons for drinking).

In summary, the four factor drinking motive model proposed by Cooper (2004) is mostly supported by the current findings although reasons identified by participants often related to multiple motives. In the previous paragraph we also touched upon an example of context-specificity in motives. In the next section, the meaning and nature attributed by participants to the context in which they consume alcohol is explored. Further, common patterns of influence (of context) on participants' drinking motives, alcohol use and drinking consequences are discussed, in order to gain a detailed understanding of the role context plays in motivated drinking.

**4.1.2.3 Nature and influence of the drinking context.** The drinking contexts identified by participants were somewhat variable depending on the individual and the focus group in question. However, generically they can be categorised into four broad groups; 1) features of self, 2) features of the physical environment, 3) features of the social environment and 4) timing of the drinking opportunity. Importantly, consideration of these contextual factors provides a greatly enriched understanding of why and to what effect, this sample consumed alcohol. The nature of each contextual factor is described below, along with its contribution to our understanding of drinking behaviour.

**4.1.2.4 Features of self.** Participants identified a number of context variables relating to internal aspects of the self. The most common of these concerned aspects of *physical wellbeing*, including illness, fatigue, level of intoxication, and one female participant also identified hormones as an indirect determinant of her motivation to drink via the effect it has on her mood. Participants made comments such as “if you’re feeling run down or sick you don’t really want to have a big night so you tend to just lay

off a bit” and “if I’m feeling tired ... [I] just want to go home”. Regarding intoxication, two participants, including Ann, described having reduced decisional control over their drinking when highly intoxicated:

*“[If] I’m past four [drinks], I’m going to just keep drinking, so then I’ll just find whatever booze is around and keep drinking...” (Ann, 23)*

*Emotional factors* such as mood and level of personal distress also emerged as important factors influencing drinking motives and alcohol use. Some participants described being motivated to drink to enhance their existing positive mood, and also to reduce or “detach” from negative mood states. Importantly, the participants of one focus group drew a distinction between drinking when highly emotionally upset versus more moderate levels of distress, citing different drinking motives for each:

*“Not when you’re really upset. I mean maybe if you were stressed it might help. Or if you were just a little uptight, but if you are like severely upset about something then drinking really isn’t a good idea.” (Fern, 19)*

Another participant showed less concern about the negative consequences associated with drinking when highly emotional:

*“When really stressed at home I’d have like a glass of wine before bed. A few times I’ve gone a bit overboard with it as well just to escape it.” (Veronica, 19)*

Another feature of the self—though heavily influenced by a number of features of the social and physical environment, discussed in detail below—is the individual’s *perception of risk* and responsibility surrounding each drinking episode. In all focus groups most participants reported having some awareness and consideration of the risk of physical and social harm exposed to themselves and others in any drinking situation, and reported consciously moderating their drinking contingent to these risks. Participants tended to report immediate risks (such as embarrassment, or sexual assault) rather than long term risks (such as liver damage, or obesity).

*“When you’re at a club you know there’s people around, there’s people you don’t really know, you don’t want to put yourself in a position where you, you know, pass out in the toilet . . you wake up and . . .that sort of thing. So I guess you kind of, well for me, I tend to like to be in control, so that I know that, ok, I’m going to get home safely.” (Trish, 19)*

Important too was an individual’s *prior planning* and commitment towards undertaking drinking or alternative behaviours (such as the taking on roles of responsibility like driving, caring for friends, or working the next day).

**4.1.2.5 Physical environment.** A number of features relating to the physical drinking environment emerged as important contextual factors that influenced motives and opportunities for drinking. These included *aspects of the alcohol* itself (the cost, the quality and the degree of availability), and of the *drinking setting* more generally - each which afforded the attainment of different goals. The following distinct drinking settings were identified; a) bar/club/pub, b) party/gathering/celebration/festival, c) home, d) family event, and e) restaurant.

The most commonly identified drinking setting was at a *bar/club/pub*, and although participants identified some subtle differences between these three locations, for the purposes of this analysis they were grouped together as all settings typically involved a mixture of peer aged friends and strangers with some supervision provided by external organisations in the form of security and bar staff. Social drinking motives predominated within these settings, and although alcohol consumption was generally high, participants reported that the cost of alcohol was an important moderator. For example, Fern stated an important reason for drinking at inexpensive bars was “because it’s social, because everyone’s drinking, and I think the reason is because it’s cheaper to drink that way, so we drink more”.

In settings where alcohol was expensive but participants were still motivated to “get drunk”, “let loose” or “have fun” many participants reported arriving at the venue

already intoxicated having undertaken heavy drinking at home or at a party. This behaviour is consistent with the pre-drinking phenomenon described in the literature (Wells, Graham, & Purcell, 2009). Interestingly, despite the high level of intoxication when attending these settings, most participants reported experiencing relatively few negative consequences due to the presence of venue staff to regulate risky behaviour, and because participants would typically sober up as the night progressed.

*“it has something to do with the pre-drinking because you are drinking so much beforehand you go to the club, I would probably only have two or three drinks max at a club because I’ve reached my peak and I’m just here to dance and just sober up and go home, so I find that clubs for me like I tend to just sober up and I tend to get a bit more subdued.” (Trish, 19)*

The *party/gathering/celebration/festival* grouping was also commonly described by participants, and was characterised by cheap / free drinks (mainly wine and beer), a mixture of close friends and strangers, and a cultural /social expectation of drinking. Although social and enhancement related motives once again predominated in these settings, individuals’ reported drinking for a range of different, and often idiosyncratic, reasons depending the particular meaning they attributed to each setting. For example Frank (aged 20 years) reported drinking to ‘reduce social anxiety’ at a party and ‘to enjoy the music more’ when at a gig, Ann also reported drinking for ‘social anxiety’ at parties but to ‘have a good time’ at a music concerts, whereas Fiona stated that she drinks “pretty much always to get drunk, unless I’m driving”.

The negative consequences described tended to be more serious in nature and typically involved physical sickness and social embarrassment:

*“. . . you have like punch table, you have beer, you might have shots, might have all sorts of different things and we literally go around and bang, bang, and it’s probably within 20mins that we’ve had probably 8 or even more drinks in that time and yeah when I was in 1st year, that was probably the second time I had spewed from*

*alcohol, and I was just absolutely, . . . teary and just . . . and people were like 'you were just carrying on' and stuff, and I was like oh my god, how embarrassing and everything and just like got put to bed and had the power spew."* (Trish, 19)

The *home* environment described by participants incorporated episodes of drinking alone, with a partner, with friends and with family, and for many different reasons including "it goes with dinner", "for relaxation" from daily stressors, "to share a nice experience" with a partner or family, and to "get the ball rolling in terms of drinks consumed" prior to going out to a venue. In each of these examples, the social context surrounding drinking at home emerged as an important factor influencing individuals' motives for drinking at home, however the specific meanings constructed by individuals in response to similar social contexts were somewhat variable.

Similarly, a diversity of alcohol related consequences were reported, ranging from the desired: "it eases us back into being in a relationship again", "it helps me sleep", "it gets conversations happening" and "I feel more relaxed"; to the unwanted "hangover" and "tiredness" after "I've gone a bit overboard with it".

In all five focus groups, participants spoke about drinking at *family events* such as Christmas dinners, weddings and birthdays. These drinking occasions were described as occurring less frequently than the settings described previously. This setting typically involved multiple generations of people, and was perceived by most participants as being more formal in nature. Participants' reported drinking to reduce "social anxiety" and to increase "confidence", in a setting where the stated goal was often to interact with "people I don't know that well, and people who make me anxious". All participants communicated an awareness of the risks associated with drinking too much in these settings (typically embarrassment or fear of negative social judgement) and indicated that light to moderate drinking was both preferable and most common in this context. Perhaps due to this level of insight, participants typically reported few negative alcohol-related consequences when drinking at family events.

Finally, the *restaurant* setting was characterised by expensive alcohol, drinking with others, and low levels of anonymity. Motives too, appeared to differ within this setting for individuals:

*“Usually if I’m drinking with dinner it’s more about the taste and the enjoyment of the actual alcohol, whereas when I’m drinking at parties with friends it’s more about getting tipsy or drunk ... and with a clear intent that I’m drinking for social anxiety.” (Ann, 23)*

As with family events, alcohol consumption at a restaurant tended to be less frequent, lighter, and was associated with fewer and less serious negative consequences compared to other social drinking environments. A consideration of the social environment in this, and other, settings greatly assists our understanding of why people drink, and the related consequences.

**4.1.2.6 Social environment.** Whether a person drinks alone or in the company of others represents one important aspect of the social environment. Consistent with previous findings (M. L. Cooper, 1994; Cutter & O’Farrell, 1984), a smaller proportion of people (30% in this sample) reported drinking alone. Of the three participants that did, all reported doing so in a home setting, “to unwind”, “detach” and “relax”. In this sample, alcohol use was generally light, with just the occasional heavy episode reported, and consequences identified were largely positive, fulfilling participants’ stated reasons for drinking.

When drinking in the company of others, a number of additional factors inform our understanding of how and why these young adults consume alcohol. Different social contexts appear to lend themselves to the attainment of different goals, and drinking motives. For example when asked whether her reasons for drinking at parties or at home differed, Ann said:

*“Some different reasons definitely. I don’t have the social anxiety with my partner where I do have that if I’m out socially with new people or my partner’s friends that I don’t know so well.” (Ann, 23)*

Regarding drinking with others, Veronica similarly commented “I drink to have self confidence, cause I’ve always done that since I first started drinking, now I rely on that”, whereas Sally’s reasons for drinking with others were more related to conforming with others:

*“I have a few friends that don’t drink really, and when I go out with them I’ll drink less than if I were to go out with my friends that do drink more, or that do drink regularly. So it’s that you want to be the same.” (Sally)*

An important theme that emerged from the interviews was that the reasons participants provided for drinking typically matched the perceived reasons of those within their immediate environment. Conformity reasons were commonly reported including to be “part of the group”, for “peer pressure” and to avoid negative judgement and embarrassment. Although there was some variability (depending on the drinking behaviours and beliefs of individual friendship groups), in general, peer-only social gatherings were associated with heavier drinking and more serious negative consequences, such as injury and interpersonal conflict, compared to those where multiple generations were present. In the latter scenario, participants commonly reported restricting their alcohol intake to avoid negative judgement and embarrassment:

*“If there’s family there. Probably not my own but ones I don’t know, or I know but aren’t familiar with. ... I don’t want to leave a bad impression even if it [my consumption] isn’t excessive. I still worry they’ll judge.” (Sally, 20)*

What is becoming clear from the discussion of drinking context variables thus far is that they interact and overlap to form a complex and nuanced picture of motivated drinking. A picture that, despite group similarities, appears somewhat unique and

idiosyncratic to each individual. This study suggests that one's motivation to drink can be influenced by aspects of the self (e.g., lowered mood), the drink (e.g., inexpensive wine) and social setting (e.g., alone), and that certain combinations of these factors are more commonly linked to drinking in certain physical settings (e.g., at home). Given this, it is also important to consider the timing in which the drinking opportunity takes place relative to other relevant factors.

**4.1.2.7 Timing of the drinking occasion.** Throughout the interviews, participants demonstrated an awareness and consideration of the effect consuming alcohol would have on their ability to fulfil responsibilities, such as employment, study, looking after a friend and driving, and this was reflected in their stated drinking motivations and drinking plans for any given drinking occasion. This is reflected by Don's statement below:

*"... it seems like during the day you've got obligations to be productive ...  
whereas at night time ... I feel as if it gives you a licence [to drink]." (Don, 20)*

Prior planning can also influence drinking such that an individual may not drink heavily at a party if they know that they are not going out to a club afterwards:

*"A few people were having a few but they weren't going to go out afterwards  
whereas a majority of people were there to get pretty drunk before they go out again.  
That may have been because of money issues, and just the fact that a lot of people do  
go out to clubs later at night so I guess they are kind of just filling in time and  
socialising." (Trish, 19)*

A further aspect of timing relates to events occurring prior to the drinking opportunity. Relatively unplanned drinking episodes were reported to have taken place to celebrate positive daily events such as the finishing of an exam, or winning a sporting competition, while coping orientated drinking commonly occurred after experiencing negative life events:

*“Well I definitely know there have been certain occasions where in my head I’ve gone, like I’m really stressed, I’ve had a bad week, I just want to get fucked up tonight. Those are the nights that I can’t remember.” (Ann 23)*

#### **4.1.2.8 Individual differences in context specific drinking motives.**

Overall, we have seen that the drinking motives reported by participants differed somewhat predictably from one drinking context to the next, providing general support a context specific conceptualisation of drinking motives, and consistent with the notion of *if...then...motivational signatures* discussed in the previous chapter. However, the data also revealed significant individual variability (from one participant to the next) in the way certain aspects of the drinking context related to reasons for drinking. For example, Don reported mainly drinking ‘to reduce work-related pressure’ when at home but not at a party or a music concert, whereas Ann reported drinking for similar reasons at parties and other social situations but not at home. These individual differences in context-specific drinking motives may be important in distinguishing people with more or less problematic context-specific drinking profiles (or *if...then...motivational signatures*).

Indeed, the participants appeared to be somewhat idiosyncratic in the meaning they attribute to particular drinking contexts. For example Veronica interpreted nearly all drinking contexts as being conducive to drinking alcohol, whereas Sally expressed many concerns about the potential harms associated with drinking in public situations, and these different meanings were reflected by both participants’ stated reasons for drinking. It is possible that personality differences (such as sensitivity to reward or sensitivity to punishment) may partly explain these different interpretations of context. These findings of cross-individual variation in context specific drinking motives are entirely consistent with the notion of *if...then...motivational signatures*. Indeed, we would expect each individual to have a somewhat unique signature (or profile) of

context-dependent drinking motivation, these differences may usefully distinguish one group of people from another.

#### ***4.1.2.9 Identification of meaningfully different drinking contexts.***

Having explored in some depth the nature and influence of contextual factors within the phenomenon of drinking, it is now possible to address the main aim of the study – the identification of a small number of drinking contexts, that are qualitatively different in nature, and likely to give rise to unique patterns of drinking motivation within young adults.

Three drinking situations that would be likely to activate different drinking motivations in individuals would be a) at home alone, b) at a party/gathering with peers, and c) at a multi-generational celebration/event. Based on the findings from this study, when at home alone, young adults are likely to be coping motivated, perhaps drinking to relax after a stressful week, or to assist with sleep difficulties, whilst conformity and social motives should remain relatively inactive due to the lack of social environmental cues. In situations involving a party or gathering with peers, individuals are likely to drink for social and enhancement related reasons, such as ‘to meet people’ and ‘to have fun’. Further, given the permissive peer influence, we would expect conformity drinking to be more prominent in this context compared to the others. Alcohol consumption is likely to be great within this setting, and be related to the most serious adverse consequences. The final situation, a multi-generational celebration or event, taps into a more formal social environment that is less permissive of risky alcohol use. The findings of this study would predict that coping motivation would be relatively salient in these situations for the portion of young adults that find such settings anxiety provoking, and while others may associate these settings with social and enhancement motives. Alcohol consumption is likely to be of a moderate level and be related to few negative consequences. The identification of these three drinking situations will allow

further investigation of the notion of context-specific drinking motives in a more systematic and detailed manner. Additionally, given the somewhat idiosyncratic way in which the drinking context appears to be interpreted by individuals, it is important that a comprehensive investigation of the role context plays in motivated drinking also considers the potential moderating role of personality variables, such as reward sensitivity and anxiety.

**4.1.3 Summary and Conclusion.** In summary, this study used qualitative research techniques to explore the phenomenon of non-clinical drinking across a variety of drinking situations, as reported by young adults. Thematic analysis of interview transcripts produced findings that were consistent with past research investigating people's rank endorsement of drinking motives and the relation of these to alcohol use and alcohol-related consequences. This study provided a unique contribution to our understanding of young adult drinking, by identifying four contextual factors—features of the self, the physical environment, the social environment and, the timing of the drinking occasion—that were found to influence why and how participants drank. Importantly, this finding provides support for the primary argument made in previous chapters, that an individual's drinking motives vary according to the context in which they drink in a manner consistent with the idea of *if...then...motivational signatures*. Further, the analysis of the effect of the drinking context enabled the identification of three drinking situations—home alone, a party/gathering with peers, and a multi-generational celebration/event—likely to activate different drinking motives both within- and across-individuals. This provides an important stepping stone that will allow the notion of context specific drinking motives to be explored in a systematic and more comprehensive way.

Notwithstanding the important contribution it provides, the present study is limited in a number of ways that deserve mention. First, given the exploratory nature of

the research question, a small scale research design was deemed appropriate, and consisted of a modest convenience sample of university psychology students. The extent to which this sample reflects the greater young adult population is largely unclear, making confident generalisation difficult. With regard to gender balance, the current sample was over-represented by females (70%), which may have biased the findings somewhat. The potential for unintended selection bias is also high given the convenience sampling techniques used – those with particular views regarding alcohol use may have been more likely to volunteer for participation. Additionally, the mixed methods used to interview participants (focus groups, and individual interviews) may have resulted in some inconsistency in participant interactions and discussions.

The qualitative design methodology presents a significant strength of the study— providing rich detail of the phenomenon of drinking—however by adopting this approach we acknowledge the influential role the researcher plays in constructing the meaning from participants' conversations. Particular challenge existed in identifying a small number of meaningfully different drinking contexts (the main aim of the study) from the multiple themes to emerge from the interviews. The truncation of this information into just three contexts was necessary in order to limit response burden, in subsequent studies (chapters five and six), for participants required to report their drinking motivations specific to each context. Consequently, the final selection of three meaningfully different drinking motives was necessarily made on face validity, albeit heavily influenced by the themes that emerged from the interviews. However, further research is required to test the specific nature of the relationship between context variables in a systematic and controlled way.

## **Chapter Five: Confirming the Context Specificity of Drinking Motives**

This thesis examines the nature of young people's drinking via an in-depth investigation of their self-reported drinking motives. In assessing the nature and function of young people's drinking motives, the current thesis adopted two broad aims: (i) to assess whether self-reported drinking motives operate in context-specific ways, and if so (ii) to assess the utility of this new conceptualisation by exploring how these context-specific drinking motives relate to various drinking outcomes and personality variables. Building on from the qualitative findings of the previous study, in this chapter, the first of these broad thesis aims is addressed quantitatively, using the self-reported drinking motives of 442 young individuals.

### **5.1 Review: Two Potential Models Explaining Drinking Motives**

As was highlighted in chapter three, there is growing empirical and theoretical evidence that suggests that individuals drink for different reasons from one occasion to the next. Drinking behaviour itself has been shown to vary in relation to aspects of the drinking context (such as the location, the circumstance, and social setting; e.g., Demers et al., 2002), so, it appears both logical and reasonable to anticipate that the underlying motives may also be context specific. While a context-specific conceptualisation of drinking motives has been outlined previously by a small number of authors, it has yet to gain traction within the broader drinking motive literature. Indeed, in the tradition of M. L. Cooper (1994), the overwhelming majority of literature, either explicitly or implicitly, has conceptualised drinking motives as trait-like or dispositional in nature (as evidenced by the review in chapter two). Under this dominant trait-like model, context-specific alcohol use has been explained as an interaction effect between relatively stable underlying drinking motives and context variables (e.g., M. L. Cooper, 1994), rather than by context-specific motives (as is currently being proposed).

In this chapter, I report on an original study that provides compelling new evidence that a context-specific model of drinking motives is superior to the traditional trait-like one.

## **5.2 The Current Research Gap**

In chapter three the existing evidence for the superiority of a context-specific versus trait-like model was critiqued. To briefly summarise, a number of past studies have adopted experience sampling designs that have enabled them to measure and analyse each individual's reasons for drinking across multiple occasions (Arbeau et al., 2011; Kairouz et al., 2002; Mihic et al., 2009). As was outlined in section 3.3.1, the hierarchical linear modelling techniques (that separate individual-level from situation-level variables) employed by these authors yielded results that were generally supportive of a context-specific model of motives, however evidence disconfirming a trait-like model is scarce. Kairouz et al. (2002) found that within-subjects measures of drinking reasons helped to explain situation-specific patterns of alcohol use, while Mihic et al. (2009) found evidence that situational variation in drinking motivation helped to explain alcohol-related outcomes, over and above that provided by trait-like drinking reasons. Finally, Arbeau et al. (2011) demonstrated that situational variables, such as daily mood and task accomplishment, were directly associated with daily measures of enhancement and coping drinking motives—the most direct evidence to date that drinking motives are influenced by context.

Three important gaps in the existing literature into context-specific drinking motives were identified. First, a scarcity of research has investigated the role that characteristics of the immediate drinking context (such as the drinking location, drinking circumstance, and social setting) may play in shaping individuals' specific reasons for drinking. Second, great potential benefit exists in directly comparing the context-specific model with a trait-like model of drinking motives so as to provide an

indication of which is superior. Third, it would be advantageous to test the context-specificity of drinking motives using a well accepted and popular multi-factor measure such as the DMQ-R, rather than by examining individual reasons for drinking as has most commonly been done.

The findings of the qualitative study, presented in the last chapter, provide some preliminary support for a context-specific conceptualisation of drinking motives. All ten students reported that their reasons for drinking varied, consistency, according to a range of context variables, grouped broadly into: 1) features of the individual, 2) features of the physical environment, 3) features of the social environment, and 4) the timing of the drinking occasion. Importantly, these qualitative findings established three meaningfully different drinking contexts— at home alone, at a party with peers, and at a multi-generational gathering (such as a wedding, or family gathering)—that appear to be associated with unique profiles of reasoned drinking. The identification of these three meaningfully different drinking contexts allows a promising new method for measuring context specificity in drinking motives, as is highlighted by the next two studies.

### **5.3 Current Study: Assessing Context-Specificity in Young People's Drinking Motives**

Having identified three meaningfully different contexts in which alcohol is consumed (study one), in this study the well established DMQ-R instrument was used to measure young people's drinking motives across each of these three drinking contexts. By measuring drinking motives across a variety of contexts within each subject, the first aim of the thesis was directly addressed; to assess whether young adults drinking motives operate in context-specific ways. Based on previous daily process study findings (Arbeau et al., 2011) and the detailed argument presented earlier (chapter three), it was hypothesised that context-specific patterns in participants' drinking

motives would be observed. No specific predictions were made regarding the nature of these patterns of variation due to a lack of relevant past research.

### **5.3.1 Method.**

**5.3.1.1 Participants.** Alcohol consuming individuals—those whom reported consuming alcohol in a six month period prior to participation—aged between 17 and 31 years were recruited to the study via invitations on social media, a range of online forums, email, and word of mouth throughout 2010. Although these recruitment strategies were primarily targeted towards those living in or near Melbourne, Australia (where the study was conducted), given the online nature of the study, any English-speaking individuals that met the age, and alcohol use criteria were eligible to participate. Of the 486 participants who completed the online self-report questionnaire, 30 were excluded from analyses because they did not meet the inclusion criteria (30 were outside the specified age range, and 12 reported themselves as non-drinkers). One further case was excluded due to having a high proportion of missing data (84%) and an extreme pattern of responding. The remaining 442 alcohol consuming participants were used in the analyses, and consisted of 118 males, and 324 females, aged between 17 and 31 ( $M=24.1$ ,  $SD=3.79$ ) years.

**5.3.1.2 Materials.** Demographic data (age, gender), context-specific drinking motives, context-specific drinking frequency, and information on a number of additional variables relevant to Study 3 (reported in chapter six), were obtained via an online self-report questionnaire. The battery of measures was completed by each participant in one 30-minute sitting.

**5.3.1.3 Context-specific drinking motives.** The Drinking Motives Questionnaire – Revised (DMQ-R; Cooper, 1994) was used, in a modified way, to measure context specific drinking motives. The DMQ-R is a 20-item self-report measure of the relative frequency of drinking for four conceptually and empirically distinct motives: *social*

(e.g., ‘to be sociable’, ‘because it helps you enjoy a party’), *enhancement* (e.g., ‘to get high’, ‘because it’s exciting’), *coping* (e.g., to forget your worries’ ‘to forget about your problems’), and *conformity* (e.g., ‘to fit in with a group you like’, ‘to be liked’). Each subscale contains five items, scored on a five-point response scale (1 = ‘almost never/never’ to 5= ‘almost always/always’), that are averaged to provide a motive score. To make the DMQ-R context-specific in nature, respondents were instructed to complete the measure three times (one for each of the three drinking contexts identified in study one and described fully below). They were given modified instructions: “Thinking of all the times you drink [*within context 1, 2 or 3*], how often would you say that you drink for each of the following reasons?” (with modified/added text in parentheses). Three different drinking contexts were described to respondents using the following text “1) *home*: at home by yourself, with no plans of drinking with others later that same day/night, 2) *party*: at a party or gathering where only same aged peers are present, and 3) *multi-generational*: drinking on celebratory or festive occasions where multiple generations of people are present.” Additionally, given the context-laden nature of the some DMQ-R items (e.g., ‘to be sociable’, ‘because it helps you enjoy a party’, ‘because it improves parties and celebrations’, ‘because it makes social gatherings more fun’) it was anticipated that participants may struggle to respond appropriately to all combinations of items and drinking contexts (e.g., it is difficult to imagine a situation whereby an individual may drink ‘to be sociable’ when ‘at home alone’). In an effort to minimise respondent confusion and missing responses, the further instruction was given: “Some of the reasons listed below may not be relevant to all drinking situations. Where this is the case we ask you to select the ‘almost never/never’ response.” In doing so, a reasonable assumption is made that some reasons for drinking are likely to only exist under certain circumstances.

The DMQ-R has well-established psychometric properties having been extensively validated among young people (M. L. Cooper, 1994; M. L. Cooper et al., 2008; Kuntsche et al., 2008), and confirmed in several validation studies in countries including North America, Europe, Australia, South America, and Thailand (Hauck-Filho et al., 2012; Kuntsche et al., 2006b; MacLean & Lecci, 2000; Norberg et al., 2010; Norberg et al., 2011; Siviroj et al., 2012). In the current study, internal consistency estimates within each context-specific measure of the DMQ-R were acceptable, with Cronbach's alphas ranging from .96 (Social at Home) to .79 (Conformity at Home).

**5.3.1.4 Context-specific drinking frequency.** For each of the three drinking situations outlined above, participants were asked 'How often do you have a drink containing alcohol'. Response options were: 0 = Never, 1 = Monthly or less, 2 = 2-4 times a month, 3 = 2-3 times a week, and 4 = 4 or more times a week.

**5.3.2 Procedure.** The study was conducted in accordance with ethics approval gained from the Deakin University Human Research Ethics Committee. Participants were recruited to the study via a brief invitation communicated by email, social networking websites, a range of Australian based online forums, and by word of mouth. A small lottery prize (iPod device) was offered to participants as partial compensation for the time and effort of participation. Those who followed the link to the online study were provided with a plain language statement outlining the purpose and procedures involved, and given the opportunity to complete the questionnaire. The survey was open to the public for the majority of 2010.

**5.3.2.1 Analytic procedure.** To assess the primary hypothesis that self-reported drinking motives of young individuals' would operate in a context-specific way, two statistical methods were used. First, a series of four repeated measures analysis of variance analyses (ANOVA), one for each drinking motive, were conducted to compare mean differences in participants' reported drinking motives across the three contexts

(home, party, and multi-generational events). The variance explained within each drinking motive by context was the primary statistic of interest, as it represents a measure of the extent to which drinking motives are context-specific at a group (compared with an individual) level of analysis. Individual contrasts were then explored post hoc via a series of 12 one-way repeated measures ANOVA analyses. Consistent with a context-specific conceptualisation of drinking motives, it was hypothesised that the drinking context would explain a substantial proportion of the observed variance within drinking motives. These analyses were conducted using IBM SPSS Statistics, version 21 (IBM Corp, 2012).

Second, a series of four confirmatory factor analyses (CFAs), one for each drinking motive, were used to compare two models: one where the motive was represented as a single factor (trait-like model), invariant across the three drinking situations, and another context-specific model where the motive was represented by three separate factors (i.e., by a separate factor within each situation). These two models are depicted in Figure 5.1 below. These analyses were conducted using the statistical program Mplus 6 (Muthen & Muthen, 1998-2010). Consistent with Hu and Bentler (1999), model fit was evaluated using chi-square, CFI ( $>0.90$ ), TLI ( $>0.90$ ), RMSEA ( $<0.06$ ) and SRMR ( $<0.08$ ). For each motive, the one and three factor models were compared in order to establish the extent to which the data were conforming to a trait-like versus a context-specific conceptualisation of motives. Modification indices were also examined to identify items for which respecification may lead to an improved model fit.

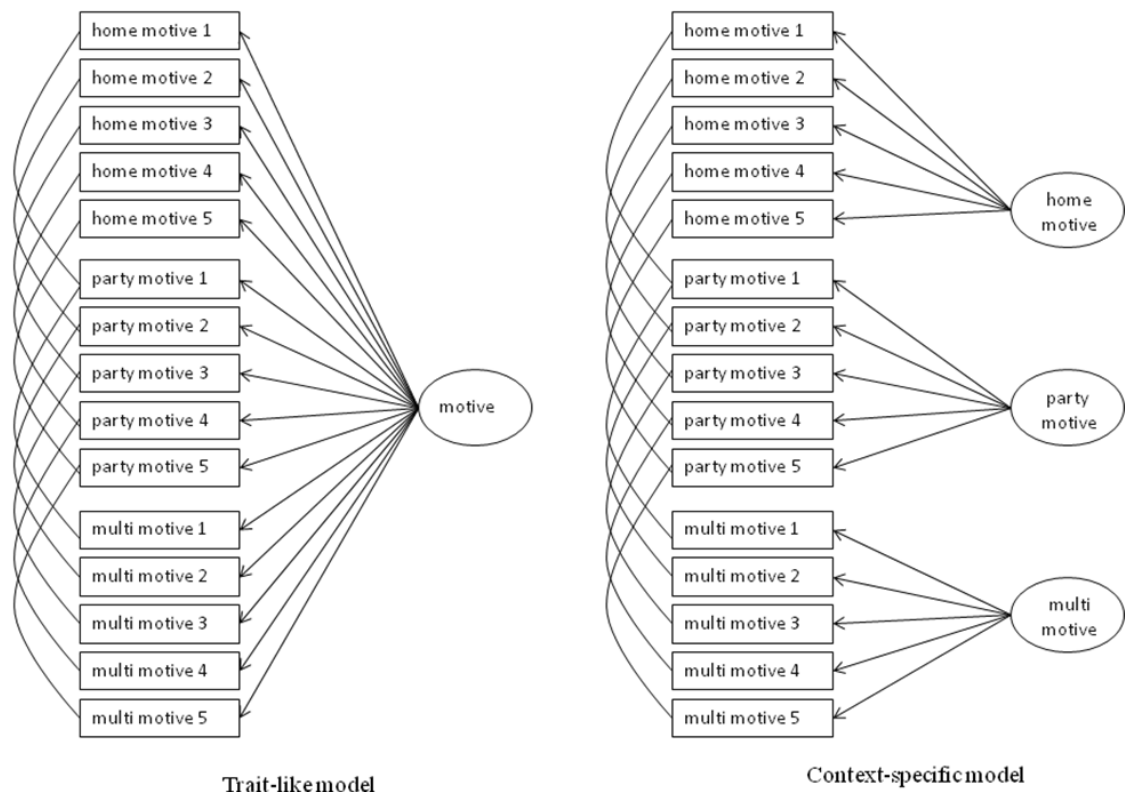


Figure 5.1 Depiction of one- and three-factor motive structures

### 5.3.3 Results.

**5.3.3.1 Initial data screening and descriptive analyses.** Preliminary analysis of the responses provided by the 442 eligible participants revealed a small proportion of missing data (2.3%). Further examination revealed a consistent pattern within some missing data, whereby respondents that reported ‘never’ drinking in a particular context (home, party, or multi-generational event) frequently neglected to complete the DMQ-R section relating to that particular context, presumably thinking that their responses were not applicable. Based on the assumption that these participants would be similarly motivated to drink as others whom also reported ‘never’ drinking in the same context, this missing data was manually replaced with the mean score of non-drinkers who had

completed the relevant DMQ-R items<sup>1</sup>. The remaining 1.33% of missing data appeared to be missing completely at random and were replaced using the multiple imputation command provided by SPSS.

In preparation for CFA analyses, all drinking motive items were screened for outliers and violations of normality. Univariate outliers (present in 33% of all items) were rescaled iteratively to within a *z-score* range of  $\pm 3.29$ . Consistent with Byrne (2001) normality was assumed when skew and kurtosis statistics were less than 2.0 and 7.0, respectively. After correcting univariate outliers, some items remained skewed. As a result, maximum likelihood estimation with robust standard errors (MLR) was used, which is robust to violations of normality (Muthen & Muthen, 2010). As expected, inter correlations between drinking motive items were generally significant and positively associated, however Pearson's correlation coefficients greatly depended on the combination of items in question (between .03 and .85).

In preparation for ANOVA analyses, drinking motive subscale scores were calculated and outliers and normality assessed in the manner described above. Twenty-five percent of subscale scores required rescaling (using the strategy outlined above), and normality statistics fell within acceptable cut offs. For all ANOVA analyses, assumptions of sphericity were checked, and when violated, the Greenhouse-Geisser correction was used in order to establish more conservative *F*-test critical values for the analysis.

The mean motive subscale scores, presented in Table 5.1, ranged from 1.18 for the conformity motive in the home context to 3.16 for the social motive in the party context. To put these mean scores into perspective, a response of 1 indicates drinking for this reason 'almost never/never' whilst 3 indicates drinking for this reason 'half of

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<sup>1</sup> An alternative replacement strategy, using multiple imputation for these missing data, was also trailed. These data produced similar results for all statistical analyses reported below.

the time'. These findings are consistent with those found previously. For example, Cooper (1994) reported similar levels and patterns of motive endorsement in her seminal US study of college students. Regarding differences across contexts, in general, the party setting elicited the greatest amount of drinking motivation from participants, followed by the multi-generational setting, and the home setting. The exception was for the coping motive which was most frequently endorsed in a party setting, followed by the home setting, and least commonly within a multi-generational setting.

Regarding the frequency of alcohol use, Table 5.1 shows that, on average, participants drank at home once per month, at a multi generational event once per month, and at a party 2-4 times per month. While the context-specific nature of these measures make comparisons with past studies somewhat difficult, these statistics appear in line those reported elsewhere (e.g., Australian Institute of Health and Welfare, 2008; Hibell et al., 2012).

Table 5.1

*Means and Standard Deviations Among Drinking Motive (DMQ-R) Subscales and Drinking Frequency.*

Measure	Home <i>M (SD)</i>	Party <i>M (SD)</i>	Multi <i>M (SD)</i>
DMQ-R			
Social	1.73 (1.11)	3.16 (1.12)	2.62 (1.13)
Enhancement	1.86 (0.95)	2.68 (1.09)	2.03 (1.02)
Coping	1.73 (0.99)	1.98 (0.99)	1.47 (0.66)
Conformity	1.12 (0.28)	1.49 (0.69)	1.19 (0.35)
Drinking Frequency <sup>a</sup>	0.97 (1.03)	1.80 (0.77)	0.97 (0.47)

<sup>a</sup> response options were: 0 = "never", 1 = "monthly or less", 2 = "2-4 times a month", 3 = "2-3 times a week", and 4 = "4 or more times a week". Home = at home alone. Party = at a party/gathering with peers. Multi = at an event with multiple generations present.

### ***5.3.3.2 Repeated measures ANOVA: Within subjects variance in motives***

***explained by context.*** The results of the four repeated measures ANOVAs, comparing

mean drinking motive endorsement across contexts, are presented in Table 5.2 below. Mauchly's test indicated that the assumption of sphericity had been violated in 3 of the 4 analyses, and in these instances the degrees of freedom were corrected using Greenhouse-Geisser estimates. All comparisons revealed significant differences between mean motive subscale scores across the three contexts of interest (home, party and multi-generational events). Of primary relevance to the aim of the thesis, however, were the partial eta squared values, which revealed that the drinking context explained a substantial proportion of the variance in motives; 43% in the case of the social drinking motive, 27% for enhancement, 25% for conformity, and 18% for coping motives. These results indicate that a substantial portion of the variance observed in drinking motive endorsement can be explained by the drinking context.

In the above analyses, it was noted that a significant proportion (45% of respondents) had reported having 'never' consumed alcohol within at least one of the three drinking contexts of concern. Further, given the uncertain effect of asking respondents to report their reasons for drinking in contexts for which they currently abstain, the above analyses were repeated with data only from the 247 participants who reported consuming alcohol across all three contexts. The original findings were replicated with a high degree of similarity, with context explaining between 46% and 20% of the variance observed in the four drinking motives.

Table 5.2

*Repeated Measures ANOVA results showing the Variance Explained in Motive*

*Endorsement by the Drinking Context.*

	Partial $\eta^2$	$F$ (df,df <sub>error</sub> )	Greenhouse-Geisser Sphericity Estimate ( $\epsilon$ )
Social	0.43	331.48 (1.82,800)	.91*
Enhancement	0.27	166.36 (1.97,866)	.98*
Coping	0.18	95.05 (2,882)	1.00
Conformity	0.25	148.75 (1.38,610)	.69*

*Note:* All analyses were significant at  $p < .05$ .

\* Sphericity violated according to Mauchly's test.

A series of 12 one-way repeated measures ANOVA analyses were undertaken post hoc to evaluate the difference in the mean endorsement of each given drinking motive across all pairs of drinking contexts<sup>2</sup>. A Bonferroni adjusted  $p$ -value of .004 for each analysis was adopted in order to maintain a family-wise  $p$ -value of 0.05. As is reported in Table 5.3 below, all comparisons of motive scores across context pairs were of statistical significance. However, more importantly the size of the effect of context on drinking motive endorsement varied widely depending on the motive in question, and the particular context pairing. Enhancement and conformity drinking motives showed a similar pattern of results, with small differences in the home-multi comparison relative to other combinations of contexts. Coping drinking motives were most different when party and multi-generational settings were contrasted, while social motives were strongly influenced by context in all pairings (with context explaining between 58% to 23% of the variance in motive scores).

When comparing levels of motive endorsement for drinking at home with those endorsed for drinking at a party, it appears that the coping motive is relatively less

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<sup>2</sup> Similarly, these 12 analyses were repeated using data only from participants who reported consuming alcohol within both of the relevant context pairs in order to test for the potential confounding influence of abstinence in any one drinking context. However, a nearly identical pattern of findings was found.

affected compared with the other three drinking motives (and particularly the social and enhancement motives). The differences in motives for drinking at home compared with at a multi-generational event were predominantly restricted to the social drinking motive. While the pattern of differences in participant motivation for drinking at a party compared to a multi-generational event were relatively consistent across all drinking motive types (with partial  $\eta^2$  ranging from .23 to .35).

Table 5.3

*Repeated Measures ANOVA Results Comparing Motive Scores Across Context*

*Pairings.*

	Comparison groups		
	Home - Party	Home - Multi	Party - Multi
Social			
partial $\eta^2$	.58	.32	.23
$F(1,441)$	602	205	134
$M$ difference	-1.43	-0.89	0.54
Enhancement			
partial $\eta^2$	.42	.03	.35
$F(1,441)$	313	13	242
$M$ difference	-0.81	-0.16	0.65
Coping			
partial $\eta^2$	.10	.11	.34
$F(1,441)$	49	54	441
$M$ difference	-0.25	0.26	0.50
Conformity			
partial $\eta^2$	.28	.04	.23
$F(1,441)$	170	17	134
$M$ difference	-0.37	-0.06	0.31

*Note:* All analyses were significant at  $p_{familywise} < 0.05$ . Home = at home alone. Party = at a party/gathering with peers. Multi = at an event with multiple generations present.

**5.3.3.3 Confirmatory factor analysis: Comparing trait-like and context specific models of drinking motives.** Results of the CFA analyses are presented in Table 5.4

below. For all four motives, the context-specific model provided a vastly superior fit. Fit statistics for the single factor (trait-like) models were well below cut-offs for acceptable fit. In contrast, fit statistics for the three factor (context-specific) models were consistently above, or very near, cut-offs, indicating excellent model fit.

The modification indices relating to the context-specific models provide further evidence of excellent model fit. In three of the four motives (social, enhancement and conformity), modification indices for all out-of-context DMQ-R items fell below 10, suggesting little potential for model improvement by using these items as additional indicators. For the coping motive, two (out of thirty) out-of-context DMQ-R items produced modification indices greater than 10. Specifically, these results indicate that model fit would be improved only marginally by using two coping items from the home context as indicators of coping motivation within the multi-generational setting (with standardised expected parameter change indices of -.21 and .35). Generally, only a very small proportion of out-of-context items were identified as being good indicators of within-context motives. These results indicate that, for all four drinking motives, a context-specific model of drinking motives provides an excellent fit to the data.

Table 5.4

*CFA Fit Statistics for One and Three Factor Models of Drinking Motives.*

	One factor models					Three factor models				
	$\chi^2(75)$	RMSEA	CFI	TLI	SRMR	$\chi^2(72)$	RMSEA	CFI	TLI	SRMR
Conformity	638 †	0.13	0.73	0.69	0.08	177 †	0.06	0.93	0.90	0.04
Coping	766 †	0.14	0.55	0.48	0.12	150 †	0.05	0.97	0.96	0.04
Enhance	1589 †	0.21	0.76	0.66	0.07	276 †	0.08	0.95	0.92	0.06
Social	2077 †	0.25	0.53	0.34	0.21	177 †	0.06	0.98	0.96	0.03

† statistic did not reach significance at  $p = 0.05$

The four correlation matrices, one for each drinking motive, reveal the level of association between participants' like-motive factor scores across different contexts

(Table 5.5 below). The pure factor scores represented in these correlations were derived from the CFA analyses reported above. Associations were strong, positive, and statistically significant, but in all cases were less than perfect (with correlation coefficients ranging from .36 to .79). The weakest correlations were found with the social drinking motive, between the home and multi-generational setting ( $r = .36$ ) and the home and party setting ( $r = .42$ ). Conversely, the strongest associations were observed between all drinking context combinations of the coping motive factor scores. Regarding the other two motives (enhancement and conformity), correlations between motive factor scores across different drinking contexts were of a similar strength (ranging from .58 to .72). Notwithstanding this variability across drinking motives, the results reveal consistent patterns of strong association between participants' motivation for drinking at home, at parties, and at multi-generational events. Although strong in nature these associations were not perfect, further highlighting a degree of variability within each participant's drinking motives as measured across three contexts.

Table 5.5

*Bivariate Correlations of Like Drinking Motive Factor Scores Across Three Drinking Contexts.*

	Home	Party
	Social	
Party	.42	-
Multi	.36	.68
	Enhancement	
Party	.60	-
Multi	.58	.72
	Coping	
Party	.79	-
Multi	.73	.75
	Conformity	
Party	.59	-
Multi	.62	.67

*Note:* All associations were significant at  $p < .05$ . Home = at home alone. Party = at a party/gathering with peers. Multi = at an event with multiple generations present.

**5.3.4 Discussion and conclusion.** While a number of past researchers have proposed that the pattern of drinking motives endorsed by young people depend on the context in which they drink, to date, a scarcity of existing evidence supports the superiority of this conceptualisation of drinking motivation over the more traditional view of drinking motives as individual difference variables, or stable traits. In this study, the repeated measurement of drinking motives across three different drinking contexts (at home, at parties, and at multi-generational events) provided a unique opportunity to assess the context-specificity of drinking motives. Results of the present study strongly support the hypothesised view that the drinking motives of young people vary according to the context surrounding each drinking episode, and furthermore, that this context-specific model is far superior to the more traditionally accepted trait-like one.

**5.3.4.1 *The influence of context on drinking motivation.*** Consistent with past findings (Kuntsche et al., 2005), participants in the present study reported drinking most frequently for social, followed by enhancement, coping and conformity reasons. Furthermore, alcohol was reportedly consumed most frequently in the party, followed by multi-generational, followed by home settings. This pattern (most frequent for party, followed by multi-generational event, and by home alone) was also observed across three of the four motive dimensions (social, enhancement and conformity), and if replicated, may prove stable and normative for this age group. Uniquely, the coping motive was more frequently endorsed in reference to drinking at ‘home alone’ compared to a ‘multi-generational’ setting, somewhat supporting Cooper’s (1994) suggestion that drinking to regulate negative affect is strongly linked to drinking at home and when alone. However, while drinking to cope may be more common at home (compared to other reasons for drinking) the current data still indicate that drinking to

cope is most frequently endorsed in the 'party' context, where social contact is presumably high.

In addressing the primary aim of the study, the hypothesis that young people's motives relate to the context in which they drink, gains initial support from the correlations reported in Table 5.5. While the generally strong associations (of around .60) observed between repeated (across context) measures of each drinking motive are indicative of a somewhat stable, trait-like aspect to the drinking motives of young people (i.e., that individuals drink for similar reasons irrespective of the drinking context), the fact that these associations were well below perfect also signals a degree of inconsistency (or variability) in participants' reported reasons for drinking from one drinking context to the next. Clearly, if drinking motives are context specific, this type of inconsistency is to be expected. Moreover, the ANOVAs revealed that context explained a significant portion of the inconsistency observed in cross-situational drinking motives. The finding that between 18% and 43% of the variance observed in drinking motive endorsement could explained by the drinking context, further supports the notion that young people's drinking motives are indeed context-specific.

Perhaps the most compelling evidence in support of a context specific conceptualisation of drinking motives is provided by the series of confirmatory factor analyses that consistently and overwhelmingly demonstrated the superiority of a context-specific model of drinking motives over a trait-like one (based on a comparison of the fit statistics presented in Table 5.4). To my knowledge, this is the first time within the drinking motivation literature that CFA has been used to directly compare context-specific and trait-like conceptualisations of motives.

Taken together, the results of this study characterise young people's drinking motivation as having both trait-like and context specific components. While there appears to be some consistency in the reasons individuals give for drinking across

situations, in line with prediction, the nature of the drinking context explains a significant portion of the remaining error—the intra-individual variation in motive endorsement. Furthermore, this finding is entirely consistent with the social-cognitive conceptualisation of context-specific drinking motives presented in chapter three, which suggests that consistency can be found not only in the generalised pattern of motives endorsed by an individual but also by his or her context-specific pattern of endorsement.

Additionally, the ANOVA results shown in Table 5.2 suggest that extent to which motives are dependent on the drinking context varies in relation to the particular motive in question. Specifically, the drinking context appears to best explain variability in the endorsement of social drinking motivation (followed by the enhancement, conformity and then coping motivation). However, the post hoc examinations reveal important nuance in the context-specific patterns of motive endorsement.

Interestingly, enhancement and conformity drinking motives showed very similar patterns of context-specificity, with context contributing little to the explanation of each motive when home and multi-generational contexts were compared, but contributing around 30% to the explanation of each motive when other context pairs were compared (home with party, and party with multi-generational event; Table 5.3). This likely reflects the generally strong endorsement of enhancement and conformity drinking motives in the party context, compared to the home and multi-generational settings. It seems that the presence of peers may be an important factor (present only in the party context) that activates the enhancement and conformity drinking motives in many young individuals. In contrast, variation in the social drinking motive appears to be highly related to context generally, and particularly when comparing motive endorsement in the home and party contexts. Even when comparing the two social drinking contexts (party and multi-generational events), the finding that context still explains 23% of the within person variance in social drinking motivation is suggestive

of a high degree of context-specificity. Indeed, the varying level of formality, and social norms associated with multi-generational events compared with parties with peers, as described by many of the focus group participants in study one, may be important social factors explaining this context-specificity in social motives.

Finally, with a very different pattern of results, coping drinking motives were found to be most strongly explained by context when comparing differences in endorsement levels between party and multi-generational settings. Once again, based on these results, it appears possible that certain aspects of the social context play an important role in understanding the extent to which young people will drink to cope on any given occasion. In general, coping motivation was greatest within the party setting, but lowest within the multi-generational setting, perhaps reflecting young people's desire to reduce social distress associated with peer (but not family) interactions. Alternatively, given that the direction of causality cannot be inferred from these ANOVA analyses, it may also be possible that young people seek out various contexts in which to drink, in order to reduce pre-existing negative affect—and these data suggest that the party context is most common, followed by home, and then the multi-generational event.

Whether the drinking motives of young people are influenced by the context in which they find themselves, or whether these individuals actively seek out situations that best satisfy their immediate type and level of drinking motivation (or both), we can conclude from these data that the drinking motives of individuals are both somewhat stable, and somewhat changeable across drinking contexts. Furthermore, the changeable component, rather than being 'error', can be partly explained by three distinct drinking contexts. While the pattern of context specificity appears to vary depending on the motive, context contributed substantially to the explanation of all four drinking motives. If, alternatively, drinking motives were completely trait-like in nature, we would not

expect context to moderate drinking motive endorsement. Further confirmation of the superiority of a context specific conceptualisation is gained by the CFA analyses that showed unequivocally, that all motives were better explained by three context specific factors rather than a single generalised one (as evidenced by the fit statistics shown in Table 5.4).

**5.3.4.2 Limitations and concluding remarks.** A number of limitations of the current study can be identified. Given that a relatively small sample was recruited from a large target population, and that participation occurred ad hoc via the internet, there is a substantial risk of unintended selection bias. It is possible that those with a particular interest in drinking, or those highly motivated by the prize draw, may have been over represented in this sample, with an uncertain effect on the results. Indeed, some indication of this can be found with females outnumbering males almost three to one in the present sample, highlighting at least one dimension in which selection bias appears to have occurred. However, with regard to measures of drinking frequency and motive endorsement, the current sample appear largely normative (Hibell et al., 2012). Unfortunately, very little additional information with which to assess the representativeness of the sample was gathered.

A number of limitations surround the method used to measure each participant's context specific drinking motives. First, the use of retrospective participant report may be subject to inaccuracy associated with recall. Also, although motives were measured in a context specific way (in reference to drinking at home, a party and a multi-generational event), it should be noted that the measurement remained somewhat generalised in nature. Specifically, participants were asked to report their *average* reasons for drinking in each of the three context. As a result, a degree of precision was lost. Future studies that employ experience sampling methodology—such as those using

mobile phone applications to measure drinking motives closer to the moment of drinking—have a great potential to limit these types of inaccuracies.

Second, while effort has been made to identify a three meaningfully different drinking contexts with which to measure drinking motives in relation to, it must be acknowledged that the current methodology makes it impossible to identify which underlying factors (such as social setting, level of formality/ intimacy, and environmental cues) of each context are most important in determining reasons for drinking, and indeed which are of little or no importance. Indeed it is also possible that individuals associate somewhat idiosyncratic meanings to various drinking contexts, that were largely unexplored in the current study.

Third, a specific limitation exists in using a well accepted measure such as the DMQ-R, as many of the items relate to specific drinking contexts, such as a party, or social setting. As a result, the motives identified by this measure cannot be considered completely context-free, and are by the very nature of the items, more likely to be endorsed in some contexts above others. This likely contributed to the finding of context-specificity in the present study. In the future, benefit may be gained in employing relatively context-free measures of drinking motives (such as the implicit measures used by Lindgren et al., 2011) to obtain motive measures across various drinking contexts.

As mentioned above, the cross-sectional nature of the data, prevent causal inferences from being drawn. While these findings are supportive of consistent links between drinking motives and three different drinking contexts, it is unclear whether the drinking context influences young people's motives for drinking, or vice versa, or both. Longitudinal studies such as those that utilise a daily process or experience sampling techniques, are required to tease apart these complex pathways of causality. Additionally, experimental studies may usefully manipulate various aspects of the

drinking context such as emotional state (inducing positive or negative affect), the presence of others (alone versus with others), and the intention to go out later (e.g., pre-gaming versus not).

Notwithstanding these limitations, the current study supports several important conclusions. By measuring young people's drinking motives across a variety of contexts, the adequacy of a context-specific conceptualisation of drinking motives could be assessed, not only in isolation, but in comparison to a trait-like conceptualisation. Multiple analytical strategies were employed, all of which supported the hypothesis that drinking motives are context-specific in nature. The data also suggest that different drinking motives have unique patterns of context-specificity across the three drinking contexts studied. In general, socially motivated drinking appears to be most context-specific, while drinking to cope appears least affected by context.

The findings of this study provide a persuasive demonstration of the superiority of a context-specific model in explaining drinking motives, compared with a more traditional model that considers each individual's motives to be invariant across contexts. Given this conclusion, the next important step in exploring the nature of context-specific drinking motives, is to explore the potential utility in treating motives in this context-specific way. The following study does just that, demonstrating how context specific drinking motives can add to our understanding of the relationships between drinking motivation, alcohol use, exposure to harm and personality variables.

## **Chapter Six: Examining the Utility of Context Specific Drinking Motives**

The findings of study one (detailed in chapter four) and study two (chapter five) strongly support the central hypothesis that young people drink for reasons that are tied not only to each individual, but to the immediate context surrounding each drinking episode. In study one, young people clearly articulated how their reasons for drinking differed from one moment to the next in relation to 1) features of the self, 2) features of the physical environment, 3) features of the social environment and, 4) the timing of the drinking occasion. Additionally, whilst general patterns of association between contextual factors and drinking motives emerged, considerable individual differences in the meanings attributed to contextual factors were also observed. In study two, the importance of the drinking context was confirmed by quantitatively comparing the self-reported drinking motives endorsed by young adults for drinking across three situations: when at home alone, at a party with friends, and at a multi-generational gathering.

Having reasonably established the validity of a context-specific conceptualisation of drinking motives through these prior studies (i.e., addressing the first broad aim of the thesis), in this chapter the focus now shifts towards the second broad aim of the thesis; the examination of the utility of context-specific drinking motives. This second aim is addressed by considering how the relationships between drinking motives and important drinking outcomes (namely, alcohol use and exposure to harm) differ across the three drinking contexts identified earlier (home, party and multi-generational settings). Also of interest is whether the drinking context has an effect on drinking outcomes directly, or via one or more drinking motives (i.e., via a mediated pathway). Furthermore, given the indication that each drinking situation can elicit very different meanings (and hence drinking motives) from one individual to the next (see chapter four), in this chapter we also consider how the relationships between

drinking variables and context may vary between individuals, and seek to explain these differences with personality variables.

In addressing these aims, this chapter is structured in the following way. Drawing on the past research where possible, I outline likely differences in relations between drinking motives, alcohol use, and harmful consequences across each of the three drinking contexts identified in study one (home, party, and multi-generational settings). Additionally, consideration is given to how these context-specific relationships may be further moderated by trait-like characteristics of an individual (i.e., how might individual difference variables, such as trait anxiety, change the way drinking-motives, -use, -harm and -context relate to each other?). Finally, the utility of a context specific conceptualisation of drinking motives is quantitatively evaluated via a third and final empirical study. In this study the complex nature of the relationships between drinking motives and drinking outcomes are explored via three sets of multi-level linear models that seek to explain variation in (i) drinking motives, (ii) alcohol use and (iii) exposure to harm—with each probing differences both within individuals (across contexts) and between individuals (across personality dimensions).

### **6.1 The Potential Role of Three Contexts in Motivated Drinking**

The general nature of relationships between each of Cooper's (1994) four drinking motives and important alcohol related outcomes (specifically, alcohol use and exposure to harm) were reviewed in detail in chapter two. Recall that the positive drinking motives (social and enhancement) tend to positively associate with alcohol use, and appear to influence harm via this increased consumption. In contrast, the negative drinking motives (coping and conformity) relate less consistently with use, and appear to influence harm both directly and via alcohol use. However, what remains unclear is whether a new (context-specific) understanding drinking motives may reveal previously obscured context-dependence within these relationships. In particular, the three different

drinking contexts that were identified from the focus groups (home alone, party with peers, and multi-generational settings) may influence the way drinking motives, alcohol use and exposure to harm relate to each other. Drawing on existing research where possible, below I consider how each of the three drinking contexts may influence the mechanisms underlying young people's motivated drinking. Additionally, consideration is given to the potential involvement of three personality variables that may explain individual differences in these relationships: generalised anxiety, reward sensitivity and punishment sensitivity.

**6.1.1 Drinking at home alone.** Focus group participants in study one reported drinking at home as one of the most common contexts in which they consume alcohol (chapter four). This finding generally concurs with past studies however the proportion of alcohol consumed at home has been found to be greater in adolescent samples (Fraga et al., 2011) compared to young adult samples (M. L. Cooper, 1994; Demers et al., 2002). Given the lack of social contact surrounding 'drinking at home alone' it seems reasonable to expect that the more externally focused drinking motives (social and conformity) will be far less strongly endorsed by all individuals within this context. Instead, the internally derived motives (coping and enhancement), which are less dependent on the presence of other people, are likely to predominate.

Of particular interest, past research into generalised (i.e., trait-like) motives suggests that the coping motive is particularly strongly associated with both drinking at home (M. L. Cooper, 1994; Kuntsche, Knibbe, et al., 2010) and solitary drinking (M. L. Cooper, 1994). That is, those who commonly drink to reduce or avoid negative internal experiences (such as unpleasant emotions, thoughts, urges, memories and sensations) appear more likely than others to consume alcohol at home alone. The important role coping motivation plays within this context is further supported by the findings of study two (previous chapter). Recall that only the coping motivation was endorsed by

participants significantly more frequently in the home context compared with the multi-generational setting.

Furthermore, research has found solitary drinking (Neff, 1997) and coping motivation (Kuntsche et al., 2007a; Merrill & Read, 2010) to be related (both directly and via increased alcohol use) to measures of harm. These findings point towards the existence of a particularly harmful type of coping motivated drinking that occurs at home alone. Importantly, the association between the home context and the situationally variable portion of each young adult's drinking motivations (i.e., the degree to which an individual becomes *more or less* motivated to drink for a particular reason *depending on the drinking context*) remains unexplored.

**6.1.2 Drinking at a party with friends.** Another commonly reported context in which young people consume alcohol is at parties (Engels et al., 2005; Kairouz et al., 2002; Mihic et al., 2009). Indeed, in a study of some 26,348 drinking occasions reported by 6,850 university students, Demers et al. (2002) concluded that (i) the party setting, and (ii) the presence of peers, were two situational factors that contributed most highly to the explanation of episodic alcohol consumption. This is consistent with the comments made by focus group participants (chapter four) and provides reason to anticipate that alcohol use will relate strongly and positively to this context. Additionally, exposure to harm within this setting was found to be relatively serious in nature, commonly involving physical injury or severe social embarrassment (chapter four).

Regarding the involvement of drinking motives within the party context, past research is scarce and somewhat equivocal in nature. While Cooper (1994), in her sample of 1,243 adolescents, found that generalised endorsement of social and conformity motivation related positively to the party drinking, the opposite effect was found for enhancement motivation. The negative association between enhancement

motivation and party drinking was unexpected, given that parties are commonly considered by researchers to be situations that offer multiple opportunities for alcohol-related fun and pleasure seeking. However, more consistent with this expectation, Engels et al. (2005) later reported a positive association between both social and enhancement motivation and party drinking in a sample of 553 Dutch adolescents and adults.

A number of common features of parties were identified in the focus group analysis (chapter four), each with the potential to explain young adults motivated drinking within this context. Parties were typically described as highly social settings where a culture of heavy drinking prevails. Consequently, social and conformity drinking motives may be particularly commonly endorsed in this setting.

**6.1.3 Drinking at a multi-generational event.** Whilst the precise location of the *multi-generational* context may vary (e.g., home, reception centre, park or garden, restaurant, etc.,) the important feature of this context appears to be the comparatively formal and less permissive social environment (than the other contexts) that comes about from having a diverse range of people in attendance (i.e., those of different ages, interests and level of familiarity). When drinking at events such as weddings, birthdays and festive occasions, the focus group participants in study one (chapter four) generally reported drinking moderately, and with few negative consequences. Kairouz et al. (2002) found that undergraduate students drank less with family (than with friends and acquaintances) providing further reason to expect alcohol use to be low within this context. It is possible that the social benefits to be gained from drinking in a multi-generational context may be best served by the consumption of moderate amounts of alcohol. For example, it may be easier to hold an interesting and / or not embarrassing conversation with an uncle (or an employer, in the case of a work function) after consuming one drink, compared to the consumption of none or many.

Again, past research regarding the potentially different role drinking motives may play in multi-generational settings (compared to others) is lacking. Cooper (1994) showed that those high (compared to low) in social motive endorsement tended to report drinking *less* with family. Indeed, one explanation for these findings may be that the goals underpinning the social drinking motive may relate more closely to peers than family / acquaintances (the latter being more common at multi-generational events). Cooper (1994) did not find any other significant associations between drinking motives and drinking with family members, however given the generalised (i.e., trait-like) way in which motives were measured, it is possible that a range of context dependent relationships were overlooked. For example, some individuals (who are generally low in coping motivation) may become highly motivated to drink to cope with stress associated with interacting with difficult family members. The nature of these context-specific, *if...then...*, relationships require further investigation.

## **6.2 The Role of Individual Differences**

What is evident from the findings presented in studies one and two, and by the greater body of drinking motive literature (reviewed in chapters two and three), is that motivated drinking differs in somewhat predictable ways between individuals (e.g., disregarding the context in which they drink some individuals may be generally more motivated to drink to cope, while others may be more motivated to drink to socialise). Furthermore, research devoted to the identification and exploration of the individual (i.e., trait-like) differences between people that explain variation in motivated drinking (including research into demographic, personality and motive variables) have contributed greatly to the explanation of alcohol-related behaviour generally (Kuntsche et al., 2006d). As we have seen, the overwhelming majority of drinking motive research seeks to explain alcohol-related behaviour via the identification of stable, individual differences in the typical reasons why people drink (i.e., generalised motives).

Notwithstanding the growing argument made throughout this thesis that research would benefit from the consideration of the situationally variable portion of one's drinking motivation, clearly, the generalised (or trait-like) aspects are important also.

Additionally, aside from their main effect on alcohol-outcomes (i.e., use and harm), individual difference variables, such as generalised drinking motives and personality variables, may also improve our understanding of the role played by the drinking context. To explain how, first recall from the focus groups (chapter four) how individual participants sometimes interpreted drinking contexts quite uniquely. For example, "Don" found the home context most conducive for drinking 'to reduce work-related pressure' whereas "Ann" felt less inclined to drink for this reason at home, preferring instead to surround herself with friends at a party. Clearly, the relationships between context, motives and use differ between Don and Ann. Furthermore, it is possible that the differences in these relationships may be able to be explained by individual difference variables such as generalised anxiety or other personality traits.

Given the likelihood that personality variables do indeed moderate the relationships between context and alcohol-related outcomes (i.e., motives, use and harm), I now examine the potential influence of three personality variables: trait anxiety, reward sensitivity and punishment sensitivity. These three personality variables were chosen as they have previously been examined in relation to drinking motives (Kuntsche et al., 2006d), and because a logical prediction can be made that each may help to explain individual differences in context-specific motivated drinking.

**6.2.1 Generalised anxiety.** Trait anxiety (along with a range of other negative moods) appears positively related to young people's motivation to drink to cope (Kuntsche et al., 2006d). For example, coping motivation has been found to be associated with trait-anxiety, social anxiety and depression in adolescent samples (Blumenthal et al., 2010; Comeau, Stewart, & Loba, 2001; Mackie et al., 2011; Windle

& Windle, 1996; Woicik, Stewart, Pihl, & Conrod, 2009). Furthermore, Lewis et al. (2008) found that social anxiety predicted exposure to harm via the pathway of increased conformity and coping motivation, in a sample of 316 college students. These findings raise the possibility that the relationship between social settings (party and multi-generational) and negative drinking motives (coping and conformity) will be particularly strong for those high (compared to low) in anxiety. In particular, compared to low anxiety individuals, individuals high in trait anxiety may be particularly likely to experience these contexts as threatening or stressful which in turn may increase their motivation to cope and / or to conform.

Regarding associations with enhancement and social drinking motives the evidence is less conclusive, with researchers generally failing to find any relationship between positive drinking motives and various measures of generalised negative affect such as anxiety (see review, Kuntsche et al., 2006d).

**6.2.2 Reward sensitivity and punishment sensitivity.** Gray's reinforcement sensitivity theory of personality (Gray, 1982; Gray & McNaughton, 2000) is a learning theory that describes two neurophysiologically distinct individual difference factors: *reward sensitivity*, and *punishment sensitivity*. Reward sensitivity describes an individual's predilection towards reward seeking behaviour (such as exciting and novel activities)—and relates closely to measures of behavioural disinhibition, extraversion, and impulsivity (Corr, 2004; O'Connor & Colder, 2005). In contrast, punishment sensitivity describes an individual's tendency towards cautious or avoidant behaviour, with the goal to detect and resolve conflict—and relates closely with neuroticism, trait-anxiety and low extraversion (Torrubia, Avila, Moltó, & Caseras, 2001).

Reward sensitivity and punishment sensitivity mirror the mechanism underpinning Cox and Klinger's (2004b) positive reinforcement drinking motives (enhancement and social) and negative reinforcement drinking motives (coping and

conformity), respectively. Indeed studies generally bear out these associations (O'Connor & Colder, 2005; Willem et al., 2012). As a result, those highly sensitive to reward are likely to display stronger relationships between the positive drinking motives (social and enhancement) and all drinking contexts (but perhaps especially so in the party context which is likely to offer the most potential reward for drinking). Reward sensitivity may also moderate the relationship between alcohol use and harm such that those highly (compared to lowly) reward orientated may experience greater harm per drink due to more impulsive and risk taking behaviour. Conversely, those high in punishment sensitivity are likely to be more likely to drink for negative drinking motives (coping and conformity) across all contexts (and perhaps especially so in the home context where avoidance orientated drinking may be perceived as relatively useful and risk free compared to the other drinking contexts). Indeed, given that those high in punishment sensitivity tend to be avoidance orientated and vigilant of potential harms, it is also likely that these individuals will experience less harm per drink than those low in punishment sensitivity (i.e., punishment sensitivity may be expected to weaken the *use-harm* relationship).

### **6.3 Study Three: Assessing the Utility of Context-Specific Drinking Motives - Refining our Understanding of Young People's Drinking**

Study three explores the validity and utility of a context specific conceptualisation of drinking motives via the detailed investigation of three important outcome variables: drinking motives, alcohol use and exposure to harm. Importantly, each outcome variable was measured repeatedly within each individual—in relation to the three distinct drinking contexts identified in study one (home, party and multi-generational settings). In doing so, the context specific nature of each of these variables, and their inter-relations could be comprehensively examined. Specifically, the validity and utility of context-specific drinking motives were investigated via three inter-related

study aims: to determine (i) how drinking motives differ according to context, (ii) how alcohol use varies according to the drinking context and drinking motives, and (iii) how alcohol-related harm relates to the drinking context, drinking motives and alcohol use.

The first aim was addressed by exploring the substantive relationships between context and drinking motive variables, thus providing a further test of the validity of a context-specific conceptualisation of drinking motives. The remaining two aims explored whether a consideration of the drinking context could improve understanding of important alcohol-related outcomes (use and harm, respectively), thus providing a direct measure of the utility of context-specific drinking motives. In addressing the second study aim, a set of models were run that progressively explored how the drinking context and drinking motive variables act both independently (main effects) and in concert (moderation) to explain variation in alcohol use. Of secondary interest was whether context variables would associate with use via motives (mediation) or directly. Similarly, in addressing the third study aim, a set of models examined how the drinking context, drinking motive, and use variables related independently and jointly to a measure of harm. In doing so addressing the important question of whether the drinking context would moderate any of the relationships between drinking motives and harm, and whether context would associate with harm directly, via drinking motives (mediation), or indeed via use (also mediation).

Additionally, the multi-level linear modelling (MLM) techniques employed in study three provided a unique insight not only into the relationships between the drinking context, motives, use and harm variables (outlined above), but also allowed for the identification and explanation of individual differences in these relations. Any significant individual variations in the nature of these relationships were regressed onto personality variables (anxiety, reward sensitivity and punishment sensitivity) in an attempt to understand them. In doing so, study three refines our understanding of young

people's drinking via a comprehensive exploration of the role of three drinking contexts.

### **6.3.1 Method.**

**6.3.1.1 Participants and materials.** Participants for this study were the screened sample of 442 young people described in Study Two (previous chapter). All were English speaking individuals (118 males, and 324 females), aged between 17 and 31 years ( $M=24.1$ ,  $SD=3.79$ ), who had consumed alcohol in the previous 6 month period.

Participants completed an online self report questionnaire that measured demographic information (age, gender) and the following within- and between subject variables. For brevity, only the measures unique to the current study are described in detail. Information on previously reported measures can be found in chapter five.

#### **6.3.1.1.1 Level 1 – Within subject measures.**

**6.3.1.1.1.1 Drinking Motives.** A context specific adaption of the Drinking Motives Questionnaire – Revised (DMQ-R; Cooper, 1994) was administered as a repeated measure (detailed in section 5.3.1.3). This instrument provided a measure of each individual's average level of *social*, *enhancement*, *coping* and *conformity* drinking motivation across three drinking contexts: a) home: at home alone, b) party: at a party with peers, and c) multi-generational: at a gathering where multiple generations are present.

**6.3.1.1.1.2 Alcohol Use.** The Consumption factor of the Alcohol Use Disorders Identification Test (AUDIT-C; Babor, Higgins-Biddle, Saunders, & Monteiro) was used in the present study as a measure of alcohol *Use*. The three items that contribute to the consumption factor ask participants to report the usual frequency and quantity of their drinking, as well as the average frequency with which they consume six or more drinks on one occasion. The psychometric properties of the AUDIT-C are good, as evidenced

by strong temporal stability, internal consistency, and sensitivity to alcohol use disorders (Reinert & Allen, 2007).

For the present study, participants were asked to respond to each item in reference to the three drinking contexts: a) “at home alone”, b) “at parties / gatherings with peers” and c) “at celebrations / gatherings with multiple generations”. The context specific internal consistencies obtained were .87 for the home, .80 for the party, and .76 for the multi-generational setting.

**6.3.1.1.3 Alcohol-related harm.** *Harm* was measured with the Short Inventory of Problems - Lifetime (SIP-2L; William R Miller, Tonigan, & Longabaugh, 1995). The 15-item SIP-2L is a condensed version of the 45-item Drinker Inventory of Consequences (William R Miller et al., 1995). The SIP-2L contains 15 alcohol related harmful consequences relating to five domains: physical (“My health has been harmed because of my drinking”), interpersonal (“My family has been hurt by my drinking”), intrapersonal (“I have been unhappy because of my drinking”), impulsivity (“I have taken foolish risks when I have been drinking”), and social responsibility (“I have failed to do what is expected of me because of my drinking”). Respondents are instructed to indicate (yes/no) whether each has ever happened to him/her. Evidence supports the strong psychometric validity of a single factor solution for the SIP (Alterman, Cacciola, Ivey, Habing, & Lynch, 2009), consequently the total SIP score was used in the present study as a measure of alcohol related harm.

For the present study, the wording of each item of the SIP-2L was modified to enable the assessment of drinking problems that were specific to alcohol use in each of the three drinking contexts of interest. Consequently, each item took three forms, for example: “I have been unhappy because of my drinking [*at home alone*]” or “[*at a party / gathering with peers*]” or “[*at a celebration / gathering with multiple generations*]” (added text in parentheses). In the present sample, Chronbach’s alphas of

the total measure were .90, .85 and .86 for the home, party, and multi-generational drinking contexts, respectively, indicating excellent internal consistency.

#### **6.3.1.1.2 Level 2 – Between subject measures.**

**6.3.1.1.2.1 Reward and punishment sensitivity.** These constructs were assessed using the 24-item Sensitivity to Punishment and Sensitivity to Reward Questionnaire – Short Form (SPSRQ-S; A. Cooper & Gomez, 2008). The SPSRQ-S comprises two subscales: punishment sensitivity scale (*punish*), and reward sensitivity scale (*reward*). Punishment sensitivity is measured by 14 yes/no items that assess reactivity to aversive situations (e.g. “are you often afraid of new or unexpected situations?”), while reward sensitivity is assessed by 10 yes/no items that assess approach orientated behaviours (e.g., “do you often do things to be praised?”).

The SPSRQ-S shows evidence of a strong two factor structure, good item properties, and acceptable reliability (A. Cooper & Gomez, 2008). In the present sample, internal consistency was good for the punishment subscale ( $\alpha=0.85$ ) but slightly lower than the commonly accepted cut-off of 0.7 for the reward subscale ( $\alpha=0.66$ ).

**6.3.1.1.2.2 Anxiety.** Anxiety was measured using the 7-item anxiety subscale of the Depression Anxiety Stress Scales (DASS21; S. H. Lovibond & Lovibond, 1996). Participants responded to items using a four point Likert scale (ranging from “0, did not apply to me at all” to “3, applied to me very much, or most of the time”). The DASS21 has been extensively studied and the factor structure, validity and reliability confirmed across a range of samples (Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005; P. F. Lovibond & Lovibond, 1995; Norton, 2007). For the present sample, the anxiety subscale internal consistency was satisfactory ( $\alpha=0.82$ ).

**6.3.1.2 Procedure.** The current study used data obtained from study two. This procedure is detailed in section 5.1.3 in chapter five.

**6.3.1.2.1 Analytic procedure.** The relationships of interest were explored using Multi-level Linear Modelling (MLM). Unlike traditional linear modelling approaches, MLM is appropriate for analysis of nested data (in this case, context-specific measures of drinking motives and outcomes nested within individuals). In effect, MLM enables us to understand how the drinking context associates with motives and drinking outcomes (e.g., are people more likely to drink to conform when at a party?), as well as how these relationships may differ for specific individuals (e.g., are some individuals more likely to drink to conform at a party compared to others?) and also to explore potential reasons for this individual variation (e.g., are anxious people more likely to drink for conformity at a party compared to non-anxious people?).

Within MLM, effects can have two components: a fixed component and a random component. Fixed components are aspects of an effect that do not vary across individuals in the sample. For example, on average (i.e., across all participants) the social motive may positively associate with level of alcohol use. However, within MLM, this relationship can also be modelled as having a random component that varies across individuals. For example, social motivation may more strongly relate to level of drinking for some individuals compared to others. Both components of an effect can be tested for significance. In the case where the random component is significant (i.e., where the effect is variable across individuals), this variation can be explained as a function of between participant variables. For example, in the case where the relationship between the social drinking motive and alcohol use was variable across participants, this variation could be modelled as a function of reward sensitivity. In other words, an individual's level of reward sensitivity could moderate the relationship between social drinking motivation and alcohol use. In particular, it might be the case that the social drinking motive relates more strongly to alcohol use for those with higher reward sensitivity compared to those with lower reward sensitivity.

Given the complexity of the research questions and the sample size, rather than a single analysis, the three questions were addressed by three sets of multilevel models (each depicted in Figures 6.1, 6.2 and 6.3). The first set of models examined predictors of drinking motives (addressing aim one), the second explored alcohol use (addressing aim two), and the third series examined alcohol related harm (addressing aim three). The models within each set were nested in nature, with each subsequent model contributing an additional predictor variable.

In all three sets of models, data were prepared in the following way. First, consistent with Heise (1972) the three-level nominal variable *drinking context* was converted into two dichotomous variables; *multi* (1=multi, 0=not multi), and *party* (1=party, 0=not party). Second, consistent with the recommendation of Bolger and Laurenceau (2013), the between- and within-subject variation in the covariates was partitioned out into separate variables. For example, each individual's alcohol use scores consist of within-participant variation (e.g., compared to the other contexts, does this particular individual drink more at home?) and between participant variation (e.g., on average across all contexts, does this person drink more than other people?). To increase the interpretability of the model results, it is useful to separate these two components of variance into different variables<sup>3</sup>. Consequently, drinking motive and alcohol use variables were transformed in the following way. The within participant variables (*within social*, *within enhance*, *within coping*, *within conform*, *within use*) were created using group-mean centring (where each person's mean across all contexts is subtracted for their score within each context). The between participant variables (*between social*, *between enhance*, *between coping*, *between conform*, *between use*) are the average level of the variable for the individual across all three contexts.

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<sup>3</sup> Note that these component variables were only used as independent variables in analyses. In analyses where motive or use variables were the dependent variables, the original, un-centred variables were used.

Initially, an intercept only model was tested for each outcome of interest (drinking motives<sup>4</sup>, alcohol use and alcohol related harm) to obtain the intraclass correlation (ICC). The ICC provides an estimate of the variance in the dependent variable that is explained by the nested structure. In this particular study, the ICC provides an estimate of the extent to which outcome variables (motives, use, harm) are consistent within individuals / across contexts. The higher the ICC, the more stable, within individuals, the outcome variable. When the ICC is lower, it indicates more cross-context variability (i.e., within person variation).

Following this, a common model building and testing strategy was used for each of the three nested model sets, in order to progressively explain variation in each of the outcome variables (i.e., motives, use, harm; Figures 6.1, 6.2 and 6.3 respectively). The general strategy was to explore relevant (i) covariates (e.g., *context*, *motives*, *harm*), followed by (ii) level 1 interactions (e.g., *within motives* x *context*), and finally (iii) personality variables were entered to test for main effects and for moderation of any level 1 relationships for which significant individual variability was found (e.g., *anxiety* x *context*). In all three sets, only significant relationships were modelled in subsequent models in order to reduce model complexity and to conserve statistical power. The three individual model sets are described in more detail below. All models were tested using the statistical program Mplus 6 (Muthen & Muthen, 1998-2010).

**6.3.1.2.1.1 Model set one: Drinking motives.** The first step in explaining drinking motives was to model context variables (*multi* and *party*) as predictors (model 1.1, Figure 6.1). This model was run four times, once for each motive. At this step, associations between each combination of *context* and *motive* were modelled as random effects. In instances where the random component was not statistically significant (i.e.,

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<sup>4</sup> In the case of drinking motives, this model was run four times, once for each motive.

the relationship of interest remained constant across all individuals) the effect was modelled as fixed in subsequent models. In cases where the random component was significant (indicating individual variability in that particular context-motive association), the random component was retained. In step 2, level 2 variables were added to the model as additional covariates (model 1.2, Figure 6.1). As before, this model was run four times, once for each dependent variable (i.e., drinking motive). Specifically, each drinking motive was regressed separately onto the personality variables (*reward sensitivity*, *punishment sensitivity*, *anxiety*); also, the moderation effects of personality on the relationships between context and the drinking motive were included. Put another way, personality variables were used to explain (i) variation in each drinking motive, as well as (ii) the relationship between a particular drinking context and each drinking motive.

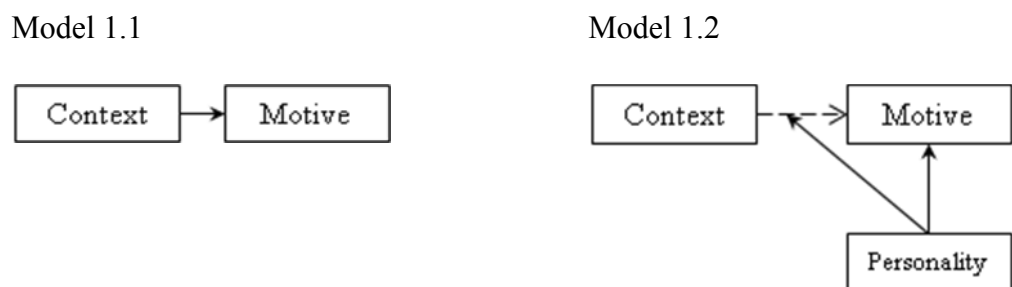


Figure 6.1. Two step model testing strategy used to examine endorsement of each drinking motive.

*Note: Unbroken lines depict previously unexplored relationships (broken lines represent relationships explored in previous models).*

**6.3.1.2.1.2 Model set two: Alcohol use.** For the second set of models, the dependent variable was alcohol use. As with model set one, step 1 was to identify significant associations with drinking context variables (model 2.1, Figure 6.2). As

before, all effects were modelled as random, and only those relationships that varied significantly across individuals were retained as random in future steps. In step 2 (model 2.2, Figure 6.2), *within-* and *between-* motives were added to the model (i.e., to examine the effect of the situationally variable, and more generalised aspects of each drinking motive, respectively). Specifically, *within-* and *between-* motives were modelled as direct predictors of use; additionally the moderation effect of *between-* motives on the relationship between context and use was also included. In essence, step 2 establishes the extent to which an individual's alcohol use is related to (i) their average level of each drinking motive across all contexts, and (ii) the degree to which each drinking motive varies from one drinking context to the next<sup>5</sup>. Furthermore, (iii) it tests the extent to which an individual's average drinking motives may change the way context relates to alcohol use. For example, the extent to which an individual consumes alcohol at a party may depend on how motivated they are to drink for social reasons more generally. As before, each *within motive* was modelled as random, and only those relationships that varied significantly across individuals were retained as random in future steps

Having already entered all of the relevant covariates, in step 3 a *within motives* by *context* interaction effect was added to the model (model 2.3, Figure 6.2). This step assesses whether the associations of *within motives* (i.e., the effects of the situationally variable component of each motive) on alcohol *use* are moderated by the *context* in which alcohol is consumed. For example, an individual may be motivated to drink to cope when in public such as at a party or at a multi-generational event, however this coping motivation may only associate with increased drinking within the party setting,

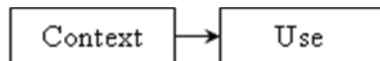
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<sup>5</sup> Note that these separate within- and between-level motive components may relate to alcohol use differently. For example, consistent with previous findings we may expect high general levels of conformity motivation to relate to less drinking, however it is also possible that, within each drinking situation, increases in conformity motivation may associate with greater alcohol use.

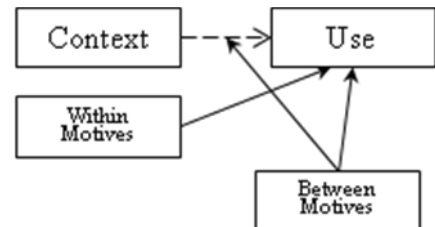
perhaps due to the different social norms relating to the two social environments (as discussed in chapter four).

Finally, in step 4, personality variables (*reward sensitivity*, *punishment sensitivity*, and *anxiety*) were entered to assess associations with *use*, and as moderators of the relationship between *context* and *use* (model 2.4, Figure 6.2). For example, does one's level of reward sensitivity relate to increased alcohol use? And furthermore, does the influence of being at a party on one's alcohol consumption also depend on one's level of reward sensitivity? Perhaps being at a party results in stronger drinking for those who are highly reward orientated.

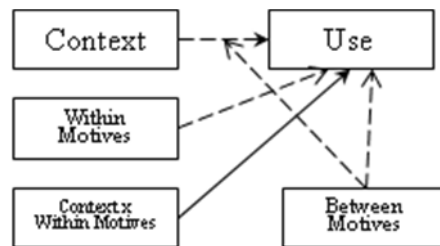
Model 2.1



Model 2.2



Model 2.3



Model 2.4

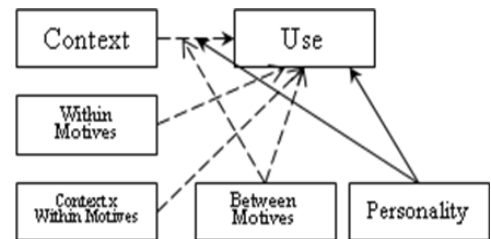


Figure 6.2. Four stage model testing strategy used to examine alcohol consumption.

Note: Unbroken lines depict previously unexplored relationships (broken lines represent relationships explored in previous models).

**6.3.1.2.1.3 Model set three: Alcohol-related harm.** For this set of models, the dependent variable was alcohol-related *harm* (Figure 6.3). To begin, the first two steps described in model set two were repeated with *harm* as the dependent variable.

Specifically, in step 1 (model 3.1) the effect of *context* variables were modelled, and in step 2 (model 3.2) *within-* and *between-motives* were also entered, and the *between motives* moderation effects of *context* variables were also assessed.

Step 3 added alcohol use variables to the model (model 3.3). Specifically, the associations of two components of use were estimated: (i) each individual's average alcohol use (*between use*), as well as (ii) the situation specific fluctuation in this use (*within use*<sup>6</sup>). Additionally, the moderation effects of the *between use* component on relationships between (i) *context* and *harm* and (ii) *within-motives* and *harm*, were also included. For example, is drinking at a party riskier for heavy compared to light drinkers? Or perhaps typically heavy drinkers may be less susceptible to harm associated with situation-specific fluctuations in their use.

At step 4, level 1 interaction terms were modelled to assess for moderation effects of within-subject covariates (model 3.4, Figure 6.3). The three interaction terms modelled were (i) *within motives* x *context*, (ii) *within use* x *context* and (iii) *within use* x *within motives*. The first interaction tests whether within-subject drinking motives associate with harm differently depending on the drinking context; for example, the harm associated with elevations in coping motivation may be greater at home compared to multi-generational settings. The second interaction assesses whether alcohol consumption is riskier (associated with greater harm) in some drinking contexts compared to others; e.g., at a party with peers compared to a multi-generational gathering. The final interaction considers the extent to which the relationship between *within use* and *harm* depends on levels of *within motives* (i.e., is the relationship between use and harm stronger when combined with elevations of some motives compared to others). Put another way, this model examines whether context-specific

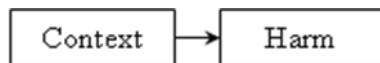
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<sup>6</sup> *Within use* associations were modelled as random at this stage and only those relationships that varied significantly across individuals were retained as random in future steps.

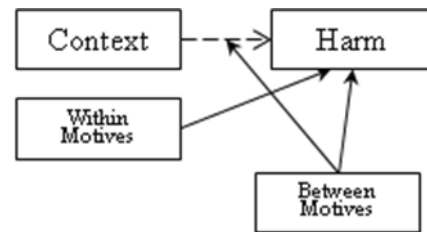
fluctuations in drinking motivation and use explain exposure to harmful consequences, both directly, and via an interaction.

Finally, at step 5, personality variables (*reward sensitivity*, *punishment sensitivity*, and *anxiety*) were entered to assess associations with *harm*, and as moderators of the relationship between *context* and *harm* (model 3.5, Figure 6.2). For example, does *anxiety* associate with greater *harm*? And furthermore, do the relationships between each drinking context and harm depend on an individual's trait anxiety (and other aspects of their personality)?

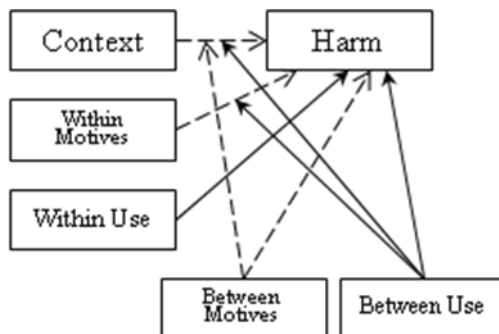
Model 3.1



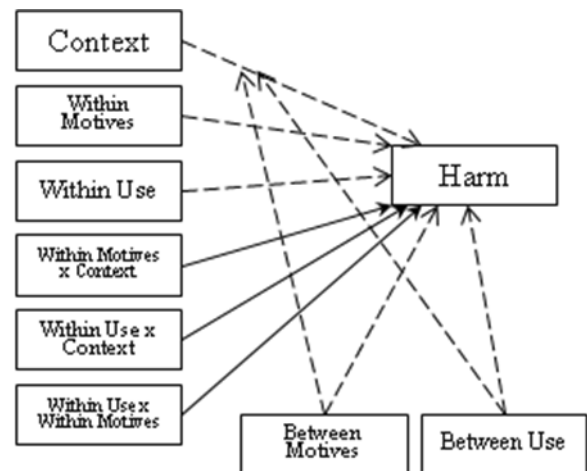
Model 3.2



Model 3.3



Model 3.4



Model 3.5

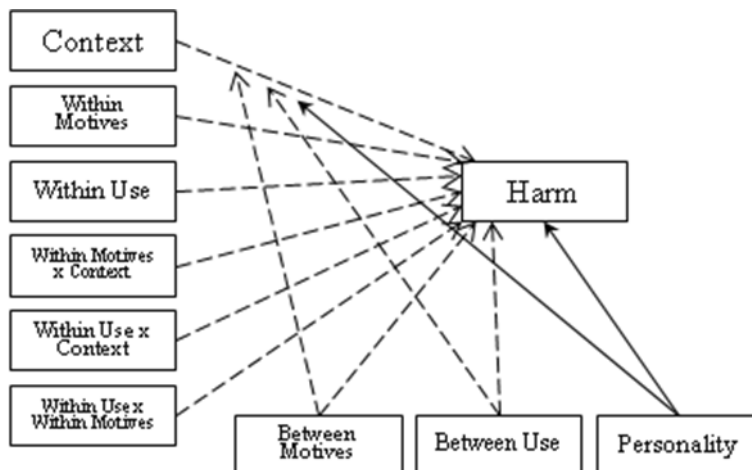


Figure 6.3. Five stage model testing strategy used to examine alcohol-related harm.

Note: Unbroken lines depict previously unexplored relationships (broken lines represent relationships explored in previous models).

### 6.3.2 Results

**6.3.2.1 Descriptive Statistics.** Summary statistics for all variables used in the study are tabled below (Table 6.1).

Table 6.1

*Means, Standard Deviations, and Correlations of Drinking Variables.*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Age	1												
2. Gender	-.18 **	1											
3. Social	-.07 **	.11 **	1										
4. Enhance	-.08 **	.16 **	.73 **	1									
5. Coping	-.12 **	.06 *	.55 **	.64 **	1								
6. Conform	-.08 **	.06 *	.47 **	.42 **	.47 **	1							
7. Use	-.04	.16 **	.62 **	.64 **	.46 **	.31 **	1						
8. Harm	-.02	.04	.46 **	.48 **	.49 **	.34 **	.62 **	1					
9. Punish	-.16 **	-.06 *	.07 *	.04	.30 **	.20 **	-.04	.11 **	1				
10. Reward	-.15 **	.25 **	.16 **	.19 **	.15 **	.14 **	.16 **	.19 **	-.07 *	1			
11. Anxiety	-.18 **	.04	.21 **	.22 **	.46 **	.29 **	.11 **	.24 **	.47 **	.12 **	1		
12. Party	N/A	N/A	.37 **	.32 **	.19 **	.32 **	.56 **	.49 **	N/A	N/A	N/A	1	
13. Multi	N/A	N/A	.06 *	-.11 **	-.20 **	-.11 **	-.13 **	-.24 **	N/A	N/A	N/A	N/A	1
Mean	24.07	.27	2.51	2.19	1.73	1.27	2.79	2.40	6.50	4.53	7.12	N/A	N/A
SD	3.79	.44	1.26	1.07	.91	.50	2.85	3.31	3.95	2.30	7.64	N/A	N/A

Gender: 1 = male, 0 = female; Party: 1 = party, 0 = not party; Multi: 1 = multi-generational, 0 = not multi-generational

\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$

**6.3.2.2 Model set one: Drinking motives.** The intra-class correlations for drinking motives (ICC; see Table 6.2) indicate that the between participant effect of motives was generally on the lower side. With the exception of the coping motive, less than half of the total variability in each motive can be attributed to the individual.

Table 6.2

*Intra-class Correlations (ICCs) from Intercept Only Models of Outcome Variables.*

Social	Enhancement	Coping	Conformity	Use	Harm
.24	.47	.61	.33	.11	.27

The drinking *context* significantly explained variation in motive endorsement, as shown by the results of the model set one (Table 6.3). Generally, all drinking motives

were most strongly endorsed in the party, followed by the multi-generational, and then the home setting. However, in a deviation from this general pattern, the *coping* motive was more commonly endorsed at home compared to multi-generational settings (as indicated by a negative b-weight for *multi*). The majority of *context-motive* relationships did not vary considerably across individuals (i.e., the random components of these effects were generally not significant), however the exception was the conformity motive. In this instance, generalised anxiety was shown to moderate the extent to which being at a party increased conformity motivation (model 1.2), such that those with greater anxiety experienced significantly stronger *party-conformity* relationships. No other personality variables explained the heterogeneity in context-conformity relationships. Regarding the main effects of *personality* variables (model 1.2), generalised anxiety and reward sensitivity were positively associated with all drinking motives, while punishment sensitivity was positively related to coping and conformity motives only.

Table 6.3

*Estimates and (Standard Errors) of MLM models predicting endorsement of Drinking Motives.*

Model 1.1							
Fixed effects (intercept, slopes)	Social		Enhancement		Coping		Conformity
	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate (SE)
Intercept	1.73***	(0.05)	1.86***	(0.05)	1.73***	(0.05)	1.12*** (0.01)
Multi	0.89***	(0.06)	0.16***	(0.05)	-0.26***	(0.04)	0.06*** (0.02)
Party	1.43***	(0.06)	0.81***	(0.05)	0.25***	(0.04)	0.37*** (0.03)
Random effects ([co-] variances)							
Level 2 (between-subject)							
Intercept	0.56***	(0.06)	0.59***	(0.05)	0.52***	(0.08)	0.06*** (0.01)
Multi	0.03	(0.10)	0.02	(0.05)	0.00	(0.12)	0.04*** (0.01)
Party	0.01	(0.12)	0.10	(0.06)	0.07	(0.04)	0.31*** (0.04)
Level 1 (within-subject)							
Residual	0.68***	(0.05)	0.39***	(0.04)	0.24***	(0.03)	0.03*** (0.01)

Model 1.2							
Fixed effects (intercept, slopes)	Social		Enhancement		Coping		Conformity
	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate (SE)
Intercept	1.20***	(0.11)	1.39***	(0.11)	0.81***	(0.04)	0.93*** (0.04)
Multi	0.89***	(0.06)	0.16***	(0.05)	0.06***	(0.02)	0.02 (0.04)
Party	1.43***	(0.06)	0.81***	(0.05)	0.37***	(0.03)	0.05 (0.06)
Anxiety	0.03***	(0.01)	0.03***	(0.01)	0.02***	(0.00)	0.01* (0.00)
Punish	0.00	(0.01)	-0.02	(0.01)	0.01**	(0.01)	0.01* (0.00)
Reward	0.07***	(0.02)	0.07***	(0.02)	0.03***	(0.01)	0.02*** (0.01)
Anxiety × Party	‡		‡		‡		0.03*** (0.01)
Punish × Party	‡		‡		‡		0.01 (0.01)
Reward × Party	‡		‡		‡		0.01 (0.01)
Anxiety × Multi	‡		‡		‡		0.00 (0.00)
Punish × Multi	‡		‡		‡		0.00 (0.01)
Reward × Multi	‡		‡		‡		0.00 (0.01)
Random effects ([co-] variances)							
Level 2 (between-subject)							
Intercept	0.46***	(0.05)	0.51***	(0.05)	0.07***	(0.01)	0.05*** (0.01)
Multi	†		†		†		0.04*** (0.01)
Party	†		†		†		0.25*** (0.03)
Level 1 (within-subject)							
Residual	0.69***	(0.04)	0.43***	(0.03)	0.13***	(0.01)	0.03*** (0.01)

\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$   
‡ not applicable.  
† effects were modelled as fixed, due to non-significant random component found in previous model.

### 6.3.2.3 Model set two: Alcohol use. Only 11% (ICC of .11) of the total

variability in alcohol use was between individuals, indicating that the alcohol use has a high degree of cross context variability. Table 6.4 presents the results of the second set of models that explore and explain the observed variation in use. Drinking *context* (model 2.1) and *motives* (model 2.2) both played a role in explaining alcohol use. Furthermore, the nature of some of these effects changed as a function of certain

individual difference variables, and also by their interaction with each other. These results are reported in Table 6.4, and are explained in detail below.

Concerning the role of the drinking *context*, alcohol use was greatest in the party, followed by multi-generational, and then home setting (as evidenced by strongest positive b-weights for *party* followed by *multi* variables; top of Table 6.4). Examination of the significance of random effect components of model 2.1 (bottom of Table 6.4) indicate that while the *multi-use* relationship remained stable across all individuals (i.e., the random effect was non-significant), the *party-use* relationship varied from one individual to the next. The results of models 2.2 and 2.4 partially explain why some individuals drink more than others when in a party setting. Specifically, the positive influence of a party context on alcohol use was stronger for those high in reward sensitivity (model 2.4), and for those with high trait-like social motivation (high *between social* scores; model 2.2).

Regarding the association between drinking *motives* and alcohol use, the results from model 2.2 indicate that the generalised (*between-level motives*) and situational (*within-level motives*) components of drinking motives predicted alcohol use differentially—furthermore, the relative involvement of each, depended on the particular motive in question. Specifically, *use* was positively predicted by generalised (between-subject) *enhancement*, *coping* and *social* motivation (although the effect of social motivation became non-significant when personality variables were controlled for, in model 2.4). In contrast, *use* was negatively predicted by generalised levels of *conformity* motivation (i.e., those who usually drink to conform tend to consume more alcohol).

When contrasting these results with the context-specific portion of each individual's drinking motives (the *within motive* variables), only the internal motives (i.e., *within enhance* and *within cope*) had any association with use (top part of table

6.4). These two relationships were positive, and remained stable across individuals as evidenced by findings of non-significant random effects (lower part of table 6.4).

The main effects (on use) of the drinking context and situational drinking motives (*within motives*) are qualified by four significant interactions (*within enhance x party*, *within social x party*, *within social x multi*, *within conformity x party*; see results for model 2.3 below). Specifically, with respect to alcohol use, the positive association of situational enhancement motivation was weaker in a party context compared to a home context (as evidenced by a significant *b*-weight of -0.67 for the *within enhance by party* interaction term). That is, the positive influence of situationally determined enhancement motivation is weaker at parties compared to home. While no overall effect of situation specific *social* motivation on alcohol use was observed (as reported above), the finding of significant and positive (i) *within social by party* and (ii) *within social by multi* interactions indicate that elevations in social drinking motivation are more strongly associated with use in response to parties and multi-generational gatherings compared to home situations. Additionally, while no main effect of situational conformity motivation on alcohol use was observed, the presence of a *within conform by party* interaction indicates that this relationship depends on the drinking context in question. Specifically, when at a party (compared to home), elevations in conformity motivation associate more negatively with alcohol use (as indicated by a *b*-weight of -0.58). However, this interaction became non-significant when the main effect of personality variables were accounted for in model 2.4.

Regarding the main effects of *personality*, the results of model 2.4 (Table 6.4) reveal that only punishment sensitivity predicts use. Specifically, the negative *b*-weight indicates that those high (compared to low) on punishment sensitivity drink significantly less on average.

Table 6.4

*Estimates and (Standard Errors) of MLM models predicting Alcohol Use*

	Model 2.1		Model 2.2		Model 2.3		Model 2.4	
Fixed effects (intercept, slopes)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)
Intercept	1.06***	(0.10)	-0.97**	(0.31)	-1.09***	(0.31)	-0.91**	(0.32)
Level 1 (within-subject)								
Multi	1.18***	(0.11)	1.15***	(0.12)	1.12***	(0.12)	1.13***	(0.10)
Party	3.99***	(0.13)	2.09***	(0.40)	1.62***	(0.28)	1.55***	(0.33)
Within Social			0.05	(0.08)	†		†	
Within Enhance			0.98***	(0.12)	1.10***	(0.16)	0.99***	(0.11)
Within Coping			0.68***	(0.14)	0.54*	(0.25)	0.60***	(0.14)
Within Conform			-0.11	(0.21)	†		†	
Within Social × Party					0.90***	(0.23)	0.89***	(0.23)
Within Enhance × Party					-0.67*	(0.33)	-0.71**	(0.29)
Within Coping × Party					-0.26	(0.42)	†	
Within Conform × Party					-0.58*	(0.29)	-0.49	(0.29)
Within Social × Multi					0.35**	(0.14)	0.35**	(0.11)
Within Enhance × Multi					-0.33	(0.22)	†	
Within Coping × Multi					0.21	(0.35)	†	
Within Conform × Multi					0.30	(0.36)	†	
Level 2 (between-subjects)								
Between Social			0.27*	(0.13)	0.29*	(0.13)	0.24	(0.13)
Between Enhance			0.89***	(0.12)	0.87***	(0.11)	0.79***	(0.11)
Between Coping			0.45***	(0.13)	0.44***	(0.13)	0.56***	(0.13)
Between Conform			-0.81***	(0.25)	-0.69**	(0.24)	-0.70**	(0.23)
Party × Between Social			0.67***	(0.19)	0.51***	(0.11)	0.49***	(0.11)
Party × Between Enhance			0.02	(0.18)	†		†	
Party × Between Coping			-0.22	(0.24)	†		†	
Party × Between Conform			-0.34	(0.39)	†		†	
Anxiety							0.01	(0.01)
Punish							-0.05**	(0.02)
Reward							0.04	(0.04)
Party × Anxiety							-0.01	(0.02)
Party × Punish							-0.04	(0.03)
Party × Reward							0.09*	(0.04)
Random effects ([co-] variances)								
	Model 2.1		Model 2.2		Model 2.3		Model 2.4	
	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)
Level 1 (within-subject)								
Residual	2.35***	(0.21)	1.54***	(0.14)	1.65***	(0.12)	1.65***	(0.12)
Level 2 (between-subject)								
Intercept	2.14***	(0.24)	0.99***	(0.18)	0.91***	(0.17)	0.86***	(0.16)
Multi	0.05	(0.38)	†		†		†	
Party	2.22***	(0.38)	1.63***	(0.26)	1.52***	(0.23)	1.41***	(0.22)
Within Social			0.02	(0.07)	†		†	
Within Enhance			0.02	(0.14)	†		†	
Within Coping			0.23	(0.19)	†		†	
Within Conform			0.08	(0.31)	†		†	

\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ 

† effect not modelled due to non-significance in previous model.

‡ effect was modelled as fixed, due to non-significant random component found in previous model.

**6.3.2.4 Model set three: Alcohol related harm.** As with previously explored outcome measures, only a small percentage (27%) of the total variability in alcohol related harm is attributable to the individual ( $ICC = .27$ ), indicating a high degree of cross-context variability. The results explaining the variation observed in *harm* scores are presented in Table 6.5 below. Overall, *context* (model 3.1), *motives* (model 3.2) and *use* (model 3.3)—but not *personality* (model 3.5)—each played a direct role in predicting exposure to alcohol-related harm. However as with alcohol use (above), some of these effects were moderated by interactions with each other and with individual difference variables (such as *reward sensitivity* and *between motive* scores).

Regarding associations with the *drinking context*, compared with drinking at home alone, alcohol-related harm was greater at a party and equal at a multi-generational event (see model 3.1 results below). However, the multi-generational setting was found to be significantly less harmful (than home) in models that controlled for the effects of alcohol use (models 3.3, 3.4 and 3.5, Table 6.5). Examination of the random components of each context effect (bottom of Table 6.5) indicate that while the *multi-harm* relationship was stable across all individuals (i.e., the random component of *multi* was non-significant), the *party-harm* relationship did vary significantly from one individual to the next (i.e., a significant random component of the effect of *party* was found). Furthermore, three level 2 (between-subject) variables partially explained why some individuals experienced greater harm than others when in a party setting. Specifically, those (i) high in *reward sensitivity* (model 3.5 results), (ii) high in generalised enhancement motivation (*between enhance*; model 3.2 results) and (iii) low in generalised conformity motivation (*between conformity*; model 3.2 results) showed significantly greater harm in party (compared with home) settings. However, when the effects of alcohol use were added in subsequent models (see model 3.3 and 3.5 results below), only the moderating effect of *reward sensitivity* on the *party-harm* association

remained significant. Additionally, the average level of alcohol use (*between use*; model 3.3), and other personality variables (*anxiety*, *punishment sensitivity*; model 3.5) failed to moderate this *party-harm* relationship.

Concerning the role of *drinking motives*, the results of model 3.2 reveal that, of the four drinking motives, only the coping motive was significantly and positively associated with harm (controlling for context, but not alcohol use). This positive *coping-harm* association was found at the situation level (*within coping*) as well as the trait level (*between coping*), highlighting the independence of these two motive components. It should be noted, however, that only the *between coping* effect remained significant when the influence of alcohol use was controlled (see model 3.3 results).

The effect of *within coping* varied significantly across individuals (i.e., the random effect component was significant, model 3.2), but this variation was not explained by typical alcohol use (i.e., the *within coping* by *between use* interaction did not reach significance, model 3.3). A number of additional factors were found to moderate the harm associated with *within coping* motivation, however, and these are reported in Table 6.5. Specifically, the relationship between situational coping motivation and harm was stronger (i) in multi-generational, compared to home, settings and (ii) when situational alcohol use was high. These moderation effects are evidenced by significant *within coping* by *multi*, and *within use* by *within coping* interaction terms, respectively (models 3.4 and 3.5). The random components of the remaining three *within motive* effects (social, enhancement and conformity) were all non-significant (bottom part of model 3.2 results, Table 6.5), indicating their stability across individuals and eliminating the possibility that these effects were moderated by individual difference variables. However, the results relating to the within-subject level interactions (model 3.4, Table 6.5) show that two of the *within motive* effects (social and enhancement) were moderated by the *within use* variable. Specifically, the

relationship between *harm* and *within social* became more negative as situational use increased (evidenced by a negative *b*-weight for the *within use* by *within social* interaction). In contrast, the relationship between *harm* and *within enhancement* increased as situational use increased (i.e., the *within use* by *within enhance* interaction was positive).

Regarding *alcohol use*, each individual's average alcohol use (*between use*), as well their use specific to each context (*within use*) was positively and independently associated with alcohol-related harm (model 3.3, Table 6.5). Furthermore, these associations remained significant when controlling for within-subject level variable interactions (model 3.4) and personality effects (model 3.5). The effect of *within use* was not variable across individuals (i.e., the random effect component did not reach significance), or across drinking contexts (i.e., all *within use* by *context* interaction effects were non-significant; see model 3.4 results).

Table 6.5

*Estimates and (Standard Errors) of MLM models predicting Alcohol-related Harm*

	Model 3.1		Model 3.2		Model 3.3		Model 3.4		Model 3.5	
Fixed effects (intercept, slopes)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)
Intercept	1.24	(0.12)	-1.84***	(0.44)	-1.19***	(0.26)	-1.15***	(0.27)	-1.62***	(0.36)
Level 1 (within-subject)										
Multi	0.04	(0.11)	0.05	(0.12)	-0.25*	(0.11)	-0.34*	(0.16)	-0.35**	(0.13)
Party	3.43***	(0.16)	2.71***	(0.73)	1.71**	(0.69)	1.10***	(0.27)	1.38***	(0.41)
Within Social			0.12	(0.09)	†		†		†	
Within Enhance			0.23	(0.12)	†		†		†	
Within Coping			0.70***	(0.19)	0.16	(0.30)	†		†	
Within Conform			0.34	(0.26)	†		†		†	
Within Use					0.35***	(0.04)	0.51***	(0.13)	0.27***	(0.07)
Within Social × Party							0.31	(0.33)	†	
Within Enhance × Party							0.05	(0.39)	†	
Within Coping × Party							0.13	(0.49)	†	
Within Conform × Party							1.01	(0.68)	†	
Within Social × Multi							-0.30	(0.17)	†	
Within Enhance × Multi							-0.03	(0.22)	†	
Within Coping × Multi							0.73**	(0.28)	0.49*	(0.24)
Within Conform × Multi							-0.16	(0.41)	†	
Within Use × Party							0.11	(0.14)	†	
Within Use × Multi							-0.07	(0.11)	†	
Within Use × Within Social							-0.11**	(0.05)	-0.10**	(0.04)
Within Use × Within Enhance							0.10*	(0.05)	0.10*	(0.05)
Within Use × Within Coping							0.12*	(0.05)	0.10*	(0.05)
Within Use × Within Conform							-0.20	(0.12)	†	
Level 2 (between-subjects)										
Between Social			0.05	(0.22)	†		†		†	
Between Enhance			0.21	(0.21)	†		†		†	
Between Coping			1.28***	(0.27)	1.08***	(0.18)	1.08***	(0.18)	0.88***	(0.21)
Between Conform			0.40	(0.47)	†		†		†	
Party × Between Social			0.31	(0.28)	†		†		†	
Party × Between Enhance			0.53*	(0.26)	0.29	(0.21)	†		†	
Party × Between Coping			-0.12	(0.28)	†		†		†	
Party × Between Conform			-1.33*	(0.64)	-0.53	(0.54)	†		†	
Between Use					0.42***	(0.09)	0.47***	(0.08)	0.46***	(0.09)
Party × Between Use					0.08	(0.11)	†		†	
Within Coping × Between Use					0.11	(0.09)	†		†	
Anxiety									0.02	(0.02)
Punish									0.04	(0.03)
Reward									0.08	(0.05)
Party × Anxiety									-0.00	(0.03)
Party × Punish									-0.03	(0.04)
Party × Reward									0.13*	(0.06)
Random effects ([co-] variances)										
	Model 3.1		Model 3.2		Model 3.3		Model 3.4		Model 3.5	
Random effects ([co-] variances)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)
Level 1 (within-subject)										
Residual	2.34***	(0.36)	1.80***	(0.40)	1.72***	(0.27)	1.97***	(0.22)	2.00***	(0.22)
Level 2 (between-subject)										
Intercept	3.96***	(0.69)	2.64***	(0.55)	2.30***	(0.40)	2.13***	(0.38)	2.03***	(0.35)
Multi	0.07	(0.55)	†		†		†		†	
Party	5.64***	(0.73)	4.64***	(0.59)	4.17***	(0.69)	4.23***	(0.59)	4.26***	(0.64)
Within Social			0.01	(0.36)	†		†		†	
Within Enhance			0.02	(0.29)	†		†		†	
Within Coping			1.25*	(0.58)	0.76	(0.45)	†		†	
Within Conform			0.10	(0.93)	†		†		†	
Within Use					0.01	(0.03)	†		†	

\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ 

† effect not modelled due to non-significance in previous model.

‡ effect was modelled as fixed, due to non-significant random component found in previous model.

**6.3.3 Discussion.** Given the need to establish the utility of a context specific conceptualisation of drinking motives, the aims of this study were to use MLM to explore (i) how drinking motives differ according to context, (ii) how alcohol use relates to the drinking context and drinking motives, and (iii) how alcohol-related harm relates to the drinking context, drinking motives and alcohol use. Additionally, the roles of personality variables in moderating each of the relationships above were also examined. The first aim provided a further test of the validity of a context-specific conceptualisation of drinking motives, while the remaining two aims assessed whether consideration of the drinking context can improve our understanding of the relationships between drinking motives and important alcohol-related outcomes (use and harm). Findings relating to each aim are discussed below.

**6.3.3.1 *The nature of context-specific drinking motives.*** The findings relating to the first aim of this study (examining the nature drinking motives) further support for the validity of a context-specific conceptualisation of drinking motives. Consistent with the evidence provided by the first two studies, the generally low stability in drinking motives observed within individuals / across contexts (demonstrated by low ICCs: Table 6.2) suggests that drinking motives do indeed vary systematically from one drinking context to the next. If drinking motives were trait-like in nature we would expect most of the variation in motive endorsements to be explained by the individual, but this was not generally the case. The ICCs found here were lower than those reported by Arterberry et al., (ICCs of around .75; 2012), however this is to be expected as their study assessed the stability (over time) of generalised motives (i.e., longitudinal measures of general drinking motives) whereas the present study specifically assessed the stability of drinking motives across situations.

Although motives were generally quite variable within individuals, some motives were more cross-situationally stable than others. In particular, the internally

derived motives, *enhancement* and *coping*, were better explained by the individual (i.e., they were more trait-like) than the externally generated ones (*social* and *conformity*). This finding is particularly interesting as it offers a new interpretation of the hypothesis put forth by Cooper (1994) in her understanding of generalised (i.e., trait-like) motives. In explaining her finding that the externally derived motives less consistently predicted drinking behaviour than the internally generated ones (a finding that has since been replicated by others; see Kuntsche et al., 2006d), Cooper argued that the external motives, with their more situationally dependent goals (such as finding a mate, or fitting in with a group), interact more strongly with the drinking setting to produce context-dependent alcohol use. While Cooper fell short of actually suggesting that external drinking motives may *themselves* be more context dependent than their internal counterparts, the present finding of lower ICCs for the external motives provides reason to believe that this may indeed be the case. That is, young adults' endorsement of external motives (social and conformity) may be more dependent on situational cues and events than their endorsement of internal motives (enhancement and coping). Put another way, the external drinking motives appear to be more state-like than the internal drinking motives.

*Context* and *personality* variables, both jointly and independently, played a role in explaining young people's endorsement of drinking motives. However the nature of these relationships differed somewhat depending on the motive in question. Generally, drinking motives were more strongly endorsed in *party*, *multi* then *home* settings (Table 6.3). The exception was coping motivation which tended to be endorsed more strongly in the home context compared to the multi-generational context. This pattern of motive

endorsement across contexts was also identified by the ANOVAs in study two<sup>7</sup>, supporting the conclusion that drinking motives tend to be strongest in the party setting, perhaps due to the presence of many and varied goals within this setting (e.g., same and opposite sex peers, availability of inexpensive alcohol, permissive drinking norms, perceived safe environment) for many young adults. Further, while drinking motives were generally stronger within the multi-generational context compared to the home context (perhaps due to differences in the social and physical environment), the opposite was found for coping motivation. This is consistent with past findings showing a unique link between coping motivation and drinking at home (M. L. Cooper, 1994; Kuntsche, Knibbe, et al., 2010). However, while drinking at home alone may be uniquely perceived as a good way to reduce non-socially generated negative emotion, our findings suggest that (as with the other motives) parties are still more common for this kind of drinking.

Personality variables were found to explain drinking motive endorsement both directly and, in the case of conformity motivation, via an interaction with the party context. Specifically, generalised anxiety and reward sensitivity positively predicted all drinking motives, whereas punishment sensitivity only predicted the negatively orientated drinking motives (coping and conformity). Consistent with reinforcement sensitivity theory (Gray, 1982), these findings indicate that punishment sensitivity may play a targeted role in activating only those motivations directed towards the avoidance of negative consequences. In contrast, trait-anxiety and reward sensitivity appear to act on motives more broadly, as evidenced by the positive associations found with all drinking motive types (Table 6.3). Whilst these relationships were generally stable across all drinking contexts, the positive association between anxiety and conformity

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<sup>7</sup> This is unsurprising given the fundamental similarity of the analyses.

motivation was found to be significantly stronger in parties (compared to other settings). This finding is consistent with the view that parties represent environments where social pressure to drink alcohol is most keenly felt, and this appears especially so for those high in anxiety.

**6.3.3.2 Improving our understanding of alcohol use.** The second aim of the study (to understand how context, personality, and drinking motive variables relate to alcohol use) provides an initial assessment of the potential benefit in conceptualising and measuring motives in a context-specific way. The amount of alcohol consumed by participants of this study was found to depend on *personality*, drinking *context* and drinking *motive* variables. However, these relationships were qualified by a number of significant interactions. By considering these interactions (particularly those relating to the drinking context) a more accurate and nuanced understanding of alcohol use can be gained.

Concerning the direct role of context, not only were drinking motives found to be highly context specific (above), but so too was alcohol use. Indeed, the finding that only 11% of the variation observed in alcohol use was explained by the individual is consistent with previous research into the context-dependent nature of alcohol use (Carey, 1993; M. L. Cooper, 1994; Demers et al., 2002; Harford, 1983; Kairouz et al., 2002; Kuntsche, Knibbe, et al., 2010; Nyaronga et al., 2009; C. Stewart & Power, 2002). Specifically, alcohol use was found to be most strongly associated with the party setting, followed by the multi-generational and then home setting (see Table 6.4). Interestingly, this pattern of influence mirrors that found for drinking motives (recall that participants were generally more motivated to drink at a party, followed by multi-generational, and then home setting)—consequently, this finding is consistent with the view that *context* may affect *use* via drinking *motives* (i.e., a mediated relationship). Whilst this explanation may be partly true, the fact that this pattern of context-specific

use remained statistically significant even after the effect of drinking motives had been controlled (models 2.2, 2.3 and 2.4; Table 6.4) indicates the presence of a direct relationship between context and use (i.e., one not completely mediated by context-specific changes in drinking motives). In explaining these findings, perhaps certain features of the party environment, such as the availability of alcohol and abundance of alcohol related cues contribute to *unmotivated*, as well as *motivated*, drinking.

In addition to these main effects, the drinking context was found to modify the association of other variables on alcohol use. The identification of these context-specific effects are important, and particularly those relating to the involvement of drinking motives, as they give insight into the potential benefit of conceptualising drinking processes as *if... then...* motivational/behavioural signatures (as outlined in chapter three). The moderating effects of the drinking context on the influence of personality and motive variables are discussed in relation to the role of each predictor variable in turn below.

Regarding the role of personality variables, only punishment sensitivity was found to be consistently related to use. Those high (compared to low) in punishment sensitivity tended to consume *less* alcohol, irrespective of the drinking context—this despite being generally *more* motivated to drink for coping and conformity (as noted above). These seemingly contradictory results may be partly explained by the finding of a significantly negative association between conformity motivation and alcohol use, but are probably more indicative of the presence confounds such as motives for abstaining from drinking, or motives for undertaking alternative (non-drinking) behaviours. In addition, within the party setting only, reward sensitivity also predicted use; such that those high (compared to low) in reward sensitivity consumed more alcohol. Taken together, these results suggest that those highly focused on avoiding harm may restrict their alcohol use (irrespective of the drinking context), perhaps in order to protect

themselves from negative alcohol-related consequences such as embarrassment and physical harm, while those highly reward orientated may see parties as unique settings in which to pursue alcohol-related rewards such as peer bonding and excitement. Indeed, these explanations are consistent with the findings relating to the role of motives discussed next.

The between participant (generalised) portion of all four drinking motives were found to predict alcohol use in a manner consistent with past research into general (i.e., trait-like) motives—positive associations for social, enhancement and coping motives, and a negative association for conformity motivation (e.g., V V Grant et al., 2007; Kuntsche & Stewart, 2009; Kuntsche, Wiers, et al., 2010; Mazzardis et al., 2010; Németh, Urbán, et al., 2011). While the overall effect of social motivation lost significance when personality variables were entered into the model (model 2.4, Table 6.4), it did continue to predict use within a party context (as evidenced by a significant and positive *between social by party* interaction). This finding may indicate the relative importance and commonness of social rewards in a party compared to other contexts. Put another way, home and multi-generational settings may be less conducive to socially motivated alcohol use due to the relative difficulty in which meaningful social rewards can be obtained by drinking within these settings.

Importantly, in assessing the role of drinking motives in explaining alcohol use, this study also considered the unique involvement of *context-specific variation* in each drinking motive (i.e., the *within motive* variables). The results shown in Table 6.4 outline a similar pattern of associations with use as was found for generalised motives (i.e., positive associations for social, enhancement and coping motives, and a negative association for conformity), however some of these relationships were context dependent.

Specifically, *within enhancement* motivation was associated with increased use, but this effect was attenuated within the party setting (compared to other contexts). These results raise the intriguing possibility that party-specific increases in enhancement motivation may lead to smaller increases in alcohol use compared to those resulting from equivalent increases in enhancement motivation in the home or multi-generational setting. This finding is somewhat counter-intuitive, as one would expect a party environment to *strengthen*, or at least not to weaken, the relationship between enhancement motivation and use, and therefore must be interpreted with caution. Past research provides some insight into this unexpected finding. Although Engles et al. (2005) found generalised (i.e., trait-like) enhancement motivation to be positively related to drinking at a party (as expected), the present results are more consistent with Cooper's (1994) finding of a negative *enhancement-party use* relationship. Furthermore, a study by Mohr et al. (2005) found that those high (compared to low) in generalised enhancement motivation actually drank *less* on days high in positive social interactions. In explaining these findings Mohr et al. (2005) suggested that the *unique* contribution the enhancement motive plays in explaining use (after taking into consideration the effect of the social motive) may be largely *non-social* in nature, and hence negatively related to social interactions. Indeed, this reasoning may equally explain the current finding of a weaker *within enhancement-use* association in the highly social party setting (compared to other, less social settings).

Concerning the effect of other motives, alcohol use was linked to increased *within social* motivation at a party and a multi-generational event, but not at home (as evidenced by a non-significant main effect of *within social*, but a significant positive *within social*  $\times$  *party* and *within social*  $\times$  *multi* interaction effect, Table 6.4). Indeed it is not surprising that social motivation appears unrelated to use when drinking at home alone, particularly as participants were instructed to consider times when they drank at

home *with no intention of going out later that day/night*. The *within coping* motivation predicted increased use irrespective of the drinking context, suggesting a degree of cross-context stability. Finally, while the *within conformity* motive showed no overall effect on use (across all three contexts), the presence of a negative interaction with *party* provides evidence that party-specific increases in conformity motivation may uniquely curb alcohol use. In explaining these findings, there may be something unique to the party setting that encourages those who become increasingly motivated to drink to conform to increasingly ‘hold onto their drinks’ (i.e., to consume their drinks more slowly). Indeed, for these individuals, the *appearance* of drinking may be more important to achieving their goals than the *amount* consumed. Furthermore, the findings discussed above suggest that anxiety may play an important role distinguishing those that drink to conform specifically in parties, from those who do not.

With the exception of coping motivation, these findings illustrate the importance of considering the drinking context when determining the effect of drinking motives on use. Next, I explore how consideration of the drinking context may improve our understanding of the another important alcohol related outcome: exposure to harm.

**6.3.3.3 Improving our understanding of alcohol-related harm.** This section addresses the third study aim (to understand how context, personality, drinking motives and alcohol use contribute to the explanation of harm) providing a further assessment of the usefulness of considering the context-specificity of drinking motives. As with alcohol use and drinking motives, exposure to harm was also found to be highly context specific—with only 27% of the variance in context specific SIP-2L scores explained by the individual (Table 6.2). In this study, *context*, *motives* and *use* (but not *personality*) variables each played a direct role in predicting exposure to alcohol-related harm (Table 6.5 above). However, a much more precise and useful understanding of the specific mechanisms underlying alcohol-related harm can be gained by considering the way in

which context, motive, use and personality variables all interacted with each other in explaining harm.

Regarding the effect of the drinking context, the finding that the party context was associated with the greatest harm of the three drinking contexts (Table 6.5) mirrors the effects found for drinking motivation and alcohol use (above). Consequently, the party setting can be considered especially problematic in relation to all drinking outcomes. The multi-generational setting was found to be significantly less harmful than home, but only when consumption affects had been controlled (models 3.3, 3.4 and 3.5; Table 6.5). This suggests that although the type of drinking that occurs at a multi-generational setting may be safer, per drink, than that at home, overall the risk of harm in both of these settings is equalised by the greater consumption that typically occurs in multi-generational settings. These findings also suggest that the mechanism underlying harm may differ between the home and multi-generational contexts. The fact that these *context-harm* associations remained significant even when motives and use were included in the model (model 3.4) suggests that certain features each context may directly influence one's exposure to harm. The precise contextual features responsible for the different pattern of *context-harm* relationships remain largely unexplored, however, and great benefit would be gained by further research that attempts to determine the important characteristics of the drinking situation. For example, based on the preliminary research outlined in study one, it would be interesting to explore how situational changes in the self, the physical environment, the social environment and the timing of the drinking occasion may explain the greater harm associated with party drinking, and to a lesser extent home drinking, compared to multi-generational drinking. It may also be worthwhile to investigate whether there are unique risk profiles that apply to different individuals. This potential research focus is discussed in more detail in the final chapter.

The current findings also suggest that the greater harm associated with the party setting (compared to home and multi-generational events) may be more keenly experienced by some individuals than others—specifically, those high in reward sensitivity, those generally high in enhancement motivation, and those generally low in conformity motivation. Many of these individual differences can be explained by patterns of alcohol use. Recall that, within the party setting, the same individuals (those high in reward sensitivity and generalised enhancement motivation, and low in conformity motivation) tended to consume more alcohol. Supporting this view that consumption levels were responsible for the increased harm reported by these individuals, two of the three effects (*party*  $\times$  *between enhance*, and *party*  $\times$  *between conformity*, Table 6.5) became non-significant when use was controlled for (models 3.3, 3.4 and 3.5). Only reward sensitivity remained a significant predictor of harm (within the party setting) indicating the presence of a direct effect (not via use).

In further explaining these findings, it may be that the party context has the greatest potential of the three contexts to be both rewarding and dangerous at the same time. For example, compared to home and multi-generational events, parties may offer unique opportunities to find a partner, to bond with friends, to get high, and to forget your worries, but also to get in a fight, to get hung-over, to embarrass yourself, to have unsafe sex, and to be involved in an accident. This may explain why those high in reward sensitivity and generalised enhancement motivation tend to drink more at parties (as noted above) and to experience greater harm at parties. In the case of reward sensitivity, the pursuit of rewards at a party appears to attract harm that is both associated and not associated with the level alcohol consumed. The protective effect of generalised conformity motivation within a party can be explained by finding that conformity motivation associates with *reduced* alcohol use within a party setting (perhaps due to the desire to *appear* to be drinking rather than *actually* drinking). This

reduction in typical use appears to completely explain the associated decrease in harm (as noted above).

Unsurprisingly, given the well established link between alcohol use and intoxication (e.g., National Health and Medical Research Council, 2009) both between-subject and within-subject components of alcohol use were found to be positively related to harm. That is, context-specific harm was independently and positively predicted by (i) the amount an individual usually drinks, as well as (ii) the degree to which he/she drinks more or less alcohol depending on the drinking context. These findings are consistent with others linking alcohol consumption with an increased exposure to harm (Rehm et al., 2003). Furthermore, this association between use and harm appears to be stable across drinking contexts (as evidenced by non-significant *use* by *context* interaction effects, Table 6.5). This finding is important to consider because, when combined with the findings above, it provides evidence of a mechanism by which context-specific motives may influence harm (i.e., via use). Based on this reasoning, the significant effects identified in the prediction of alcohol use (outlined in the previous section) can also be considered important in the prediction of exposure to harm. Additionally, the current results suggest that some motives may be associated with particularly harmful types of situation specific alcohol use, while others tend to be relatively safe (per drink consumed). This was demonstrated by presence of three significant interaction effects of situational use by situational motive endorsement (*within use*  $\times$  *within motives*) in the prediction of harm. Specifically, alcohol use was particularly harmful in the presence of situational rises in internal drinking motivation (enhancement and coping), and less so as situational social motivation increased. This should not be interpreted as social motivation having a protective effect on alcohol-related harm; a more accurate interpretation is that situation-specific social motivation somewhat attenuates the already positive *use-harm* relationship.

The results of the current study also provide insight into the direct effect of drinking motives on harm (i.e., not via alcohol use). These direct effects are interesting, as they provide an indication of the extent to which drinking motives may lead to harm that is unrelated to the volume of alcohol consumed. In models that controlled for the influence of use (models 3.3, 3.4 & 3.5; Table 6.5) only the coping motive was found to predict harm. Specifically, both the generalised and situational components of coping motivation (*between coping* and *within coping* variables, respectively) predicted increased harm in models controlling for the effect of alcohol use, however the *within coping* motive only predicted harm within one drinking context—the multi-generational setting. The finding that generalised coping motivation is directly related to harm (not via use) is consistent with past findings (Kuntsche et al., 2007a; LaBrie et al., 2011; Merrill & Read, 2010), however our findings also indicate that increases in coping motivation that occur just within the multi-generational context also directly relate to harm. We can surmise from these findings that those motivated to drink to cope (both generally and in specific response to multi-generational events) may experience greater harm brought about by the co-existence of wider problem solving deficits in those highly motivated to cope—as has been argued by others (M. L. Cooper et al., 1995; Kuntsche et al., 2007a). Our context-specific results also suggest that there may be something unique to the multi-generational setting that makes coping motivated people more susceptible to harm, however further research would be required to identify what this may be. Alternatively, while not evident from casual inspection, the measure used to assess harm (the SIP-2L) may be more sensitive to the type of coping related harms that occur within multi-generational gatherings—resulting in an unintended measurement effect. Also, given the cross-sectional nature of the current study, direction of causality cannot be inferred and we must consider the distinct possibility

that those who experience harms unrelated to alcohol use may *become* motivated to drink to cope (rather than the other way round).

**6.3.3.4 Limitations and implications.** The limitations discussed in reference to study two (section 5.3.4.2, previous chapter) apply equally to the current study (as both studies shared the same sample, and drinking motive data). In particular, it is unclear how representative of the general young adult drinking population this ad hoc online sample is. Also, the somewhat generalised way in which context-specific motives were measured (i.e., “thinking of *all the times* you drink at a party...etc.,) likely reduced the precision of this measure, making it more difficult to identify how alcohol use and harm are affected by context-specific variation in drinking motivation. Once again, this limitation could be addressed by future studies that employ experience sampling methods in the measurement of drinking motives relative to each drinking episode—preferably as close as possible to the actual moment of alcohol consumption.

A further limitation was that *trait-like* drinking motives were not explicitly measured (i.e., participants were not asked why they drink *generally, across all contexts*). This was avoided as participants had already rated their motives for drinking in each of the three contexts and would have found it awkward and contradictory to rate them again. Consequently, while utility was established by examining how context related to motives, use and harm, no direct comparison was made with traditional (i.e., trait-like) measures of drinking motives. A future study, employing experience sampling methods, may be helpful in this regard. A trait-like measure of drinking motives could be obtained in a baseline survey as well as situation specific motives (measured in the moment). It would then be possible to assess whether the situation specific motives explain variance in use and harm over and above the trait-like measure.

A number potential limitation relates to the measures of trait-anxiety used. While the DASS21 is claimed by the authors to be unsuitable as a pure measure of state-

anxiety, some question surrounds its use as a measure of trait-anxiety, as was done in the current study (S. H. Lovibond & Lovibond, 1996). In future, alternative measures of trait anxiety (such as the State Trait Anxiety Inventory) may be more appropriate, or alternatively, modifications be made to the wording of the DASS21 (e.g., how do you feel ‘in general’) to make it more trait specific.

Additionally, many of the models tested in this study were complex (containing multiple predictor variables) and, due to this complexity, may have lacked sufficient power to identify some of the weaker relationships present in the data. Larger studies are required to confirm the effects observed, and to identify any that were overlooked due to a lack of power. Furthermore, while the analyses conducted in this study comprehensively tested whether (and found evidence that) the drinking context *moderated* the relationships between drinking motives and use/harm, in an effort to reduce model complexity, no specific analyses were included to test for *mediation* (i.e., whether the context predicted use and harm via its effect on drinking motives). While conclusions were still able to be drawn regarding the presence of direct and independent effects of context on motives, use and harm, what remains uncertain are the indirect effects of context on alcohol outcomes that operate via drinking motives. It would be interesting to conduct such analyses in future research to further refine our understanding of the mechanisms underpinning context-specific drinking behaviour. For example, with experience sampling methods, temporal mediation could be explicitly modelled. It may be that positive daily affect predicts subsequent motives, which in turn predicts subsequent drinking / consequences.

A final limitation relates to the relatively small number of predictors and outcomes explored in the present study. Burgeoning model complexity limited the inclusion of many variables, however it would be worthwhile to explore the role of (i) other individual difference variables (such as depression, impulsivity and anxiety

sensitivity and age), (ii) alcohol expectancies measured situationally (both positive and negative), and (iii) different categories of harm (such as physical, interpersonal, and social responsibility) in an effort to further understand the specific mechanisms and conditions by which situated drinking motives operate. For example, those highly sensitive to the unpleasant effects of anxiety (*anxiety sensitivity*) may be more likely to drink to conform at a party compared to those low in anxiety sensitivity (recall that the *party-conformity* association varied significantly between individuals). Furthermore, the discovery of more personality-dependent mechanisms such as these, may explain why some young adults experience stronger *party-use* and *party-harm* associations than others (as was also observed in this study).

Regarding alcohol expectancies—one's subjective expectations of the positive and negative effects of consuming alcohol, there is empirical and theoretical evidence to suggest that some drinking motives may mediate the effect of some alcohol expectancies on alcohol use (Catanzaro & Laurent, 2004; Goldsmith et al., 2009; Hasking et al., 2011; Kuntsche et al., 2007b; Kuntsche, Wiers, et al., 2010; Van Tyne et al., 2012). There is good reason, and some limited evidence, to suggest not only that drinking motives are context specific but that alcohol expectancies are also. Specifically, MacLachy-Gaudet and Stewart (2001) demonstrated that individuals' positive alcohol expectancies (arousal, social/sexual enhancement, and global positive affect) fluctuated in predictable ways in relation to three drinking contexts (social, sexual and tension). Further analyses such as this may reveal context-specific relationships that are obscured when variables are decontextualised.

Finally, it would be worthwhile identifying whether unique motivational mechanisms contribute to different types of alcohol-related harm (e.g., physical injury, drunk driving, unsafe sex, and failure of social responsibility). Future research in these

areas would be beneficial in identifying high risk populations and would inform harm minimisation and prevention intervention approaches.

Despite these limitations, this study produced findings with important implications. First, these findings are consistent with the social cognitive framework, discussed in chapter three, that posits that a greater understanding of human behaviour can be gained by attending to the context-specific nature of the behaviour itself (in this case drinking), and of the dynamics that underlie it (i.e., drinking motives). Specifically, evidence of *if...then...behavioural signatures* was discovered when examining the relationships between the drinking context and each of the two behavioural drinking outcomes (use and harm). Not only did the drinking context significantly predict both outcomes, but so too were individual differences (or individual signatures) observed in the nature of these *if...then...* relationships. For example, the party setting was found to be related to increased use, and this was particularly true for certain individuals (specifically, those with high reward sensitivity). Similarly, the party setting was associated with increased harm, and was especially harmful for those high in reward sensitivity, generalised enhancement motivation, and generalised conformity motivation.

Of particular importance, this study also extended the investigation of *if...then...signatures* to the psychological mechanisms thought to underlie drinking behaviour (i.e., drinking motives). Evidence was found that context was important in predicting each of the four drinking motives (generally, motives were strongest in party, followed by multi-generational, and then home settings). Furthermore, evidence of *if...then...motivational signatures* was seen in relation to the positive effect of a party context on conformity motivation, which was found to be significantly stronger for some individuals (those high in anxiety). These findings may help researchers identify (and potentially assist) individuals who feel pressured to drink at parties.

What has been made clear from this study is that (i) drinking motives are best conceptualised as being context dependent, and (ii) that by conceptualising and measuring drinking motives this way, we can predict drinking outcomes with greater precision and an enhanced understanding. As a result, many new lines of research are opened, presenting an exciting new opportunity to understand motivated drinking.

#### **6.4 Conclusion**

The outcomes of the study highlight the potential utility of treating motives as context specific determinants of drinking behaviour. While past research shows that the general reasons why young people drink associate with alcohol use and harm (at least cross-sectionally), the study presented in this chapter suggests that greater precision can be gained when we also take notice of the way motives change, within each individual, from one drinking context to the next. While the current study demonstrated the importance of context in explaining the relationships between motives, use and harm; it also suggested that some of these relationships may differ, in predictable ways, from one individual to the next, based on personality and other trait-like variables. Indeed, generalised drinking motives were one such group of trait-like variables that explained variation in context-use relationships (by a mechanism of moderation consistent with that proposed by Cooper, 1994; see section 3.2, chapter three). Importantly, by acknowledging that drinking motives do indeed vary within individuals, we have begun the process of understanding what may explain this variation and, furthermore, what effect these predictable changes in motivation may have on important alcohol outcomes.

## Chapter Seven: Summary and Conclusion

The central argument of this thesis is that young adults' drinking motives are most effectively conceptualised as being context specific, and somewhat transient, in nature. Whilst past research supports the view that alcohol consumption itself depends on the nature of the drinking context, relatively little has been done to assess whether the drinking motives, believed to be the most proximal determinants of consumption, are also situationally dependent. Consistent with the small number of studies that have measured motives in a situation specific way, and with social cognitive theory, it was predicted that (i) self-reported drinking motives would show patterns of context specificity, and (ii) that this context specificity would improve our understanding of the role motives play in explaining alcohol use and harm. These propositions were evaluated across three studies, the outcomes of which provide several unique contributions to our understanding of the complex and often problematic nature of alcohol use in young people. In this final chapter, I explore these contributions, and consider their implications with respect to alcohol-related theory, practice and research.

### 7.1 The Nature of Drinking Motivations

The outcomes of the thesis provide clear theoretical and empirical evidence to suggest that drinking motives have both trait- and state-like properties. That is, young adults' reasons for drinking differ in somewhat predictable ways from one individual to the next (in a trait-like way) *and also* within each individual from one context to the next (in a state-like way). While both of these trait- and state-like aspects appear to hold importance in understanding alcohol-related outcomes (use and harm), the vast majority of past research has only investigated the trait-like aspect of motives (typically asking participants to state their reasons for drinking generally, across all drinking situations). By re-conceptualising drinking motives as context specific, this significant shortcoming is addressed, and our ability to understand motivated drinking enhanced. Furthermore,

the novel research presented in this thesis showed evidence of individualised patterns of context-specific drinking motives, consistent with the notion of *if...then...personality signatures*. The specific evidence regarding the nature of drinking motives is detailed below.

**7.1.1 Motives have state- and trait-like properties.** Both trait- and state-like differences in reasons for drinking are illustrated by the findings of the focus groups (chapter four). Some individuals tended to be more (or less) motivated to drink for certain reasons, irrespective of the drinking context, than others. For example, Veronica reported being generally strongly motivated to drink for multiple reasons (including anxiety reduction, to get drunk, to socialise, and to fit in) whereas Sally reported being only moderately motivated to drink, and mainly for social reasons. Clearly, Veronica and Sally showed generalised (i.e., trait-like) differences in their reasons for drinking. However, it was also clear that many of the participants' reasons given for drinking were somewhat transient in nature. All participants easily and confidently reported drinking for different reasons from one situation to the next based, at least in part, on the particular meaning attributed to the immediate drinking context. In particular, four groups of contextual features were found to be important in determining the precise meaning (and drinking motivation) attributed to each drinking situation: (i) features of the *self*, (ii) features of the *physical environment*, (iii) features of the *social environment* and (iv) the *timing of the drinking occasion*.

Further evidence regarding the somewhat transient nature of drinking motivation is gained by the two quantitative studies that analysed young adults' motives for drinking across three unique, albeit broadly defined, drinking contexts: (i) at home alone, (ii) at a party with friends and (iii) at an event with multiple generations of people. Consistent with prediction, the confirmatory factor analyses undertaken in study two provided strong evidence in support of the superiority of a context-specific

conceptualisation of drinking motives compared to a generalised (i.e., trait-like) one.

Recall that the three factor solution (where motive factors were represented as situation specific) fit the motive data far better than the single (i.e., trait-like) factor solution did (see Table 5.4). While a minority of past researchers have proposed a situationally determined conceptualisation of drinking motives (e.g., Arbeau et al., 2011; Demers et al., 2002; Mihic et al., 2009), to my knowledge this is the first research to directly compare the two competing conceptualisations via CFA.

The validity of a context-specific conceptualisation of drinking motives was further supported by the outcomes of study three. Only part of the variation in young adults' endorsement of drinking motives could be explained by the individual, highlighting the likely role of context in determining drinking motivation. Additionally, a number of significant associations were found between various drinking contexts and drinking motives (discussed in more detail in section 7.2.1 below). Importantly, not only was the initial finding, that motives are context-specific, replicated empirically but it was also revealed that some motives appear more stable than others.

Specifically, the internal drinking motives (enhancement and coping) were shown to be more stable within individuals (across contexts) than the externally generated ones (social and conformity). This is probably due to the more situationally dependent nature of the goals relating to external motives (e.g., meeting someone, or trying to fit in), compared to the internal motives (e.g., getting drunk, or feeling better) which can be pursued in a wider variety of settings. These conclusions are consistent with past findings of generally weaker associations between the external (compared to internal) drinking motives and measures of alcohol use (M. L. Cooper, 1994; Kuntsche et al., 2006d). However, rather than some motives simply *interacting* more strongly with certain features of the drinking context—as was the conclusion drawn by Cooper

(1994)—the current findings suggest that some drinking motives actually *become* stronger in certain contexts. A subtle but important conceptual shift.

By acknowledging that drinking motives are themselves (and not just their effect) somewhat transient in nature, the precise reasons *why* and *how* motives relate to various aspects of the drinking context can be explored. Section 7.2 below outlines some of the preliminary findings from the current investigation, including the implications for risk modelling and targeted intervention. However, great potential exists for further research directed at the identification and understanding of particularly problematic context-specific motivational pathways.

This new conceptualisation may also help to explain why drinking motives appear to associate well with alcohol use cross-sectionally (e.g., Kuntsche et al., 2005), but poorly with prospective alcohol use (e.g., Schelleman-Offermans et al., 2011). Indeed, if motives operate within the moment and fluctuate in context specific ways, we would expect them to be poor predictors of future behaviours. Based on this reasoning, drinking motives may have most utility in predicting short term outcomes, when measured in a way that is context-specific / state-like.

**7.1.2 If...then... motivational signatures.** Regarding the theoretical underpinnings of context specific drinking motives, the finding that drinking motives have trait- and state-like properties is entirely consistent with the social cognitive approach to personality that holds that human traits and behaviour operate in patterns that are inherently context-specific. Recall that Mischel proposed a cognitive-affective personality system (CAPS) to describe how one's stable and unique network of thoughts, feelings, goals and expectancies (broadly defined as cognitive-affective units, or CAUs) may interact with important features of the context to produce somewhat individualised *if...then... personality signatures* (context specific patterns of behaviour and thought; Mischel, 2004). While past research has found evidence of

*if...then...personality signatures* in relation to alcohol use (Mohr et al., 2013), our findings add to the existing literature by suggesting that these individualised context-specific profiles may also extend to the drinking motives that underlie alcohol consumption.

This proposition of *if...then... motivational signatures* was supported by the finding that that personality traits can interact with the situation to produce a particular drinking motivation. In particular, parties were found to be particularly strongly associated with conformity motivation for some individuals (specifically, those high compared to low in anxiety). That is, a highly anxious person may find parties more conducive to conformity motivation compared to someone who is low in anxiety, perhaps due to the different meaning each person attaches to the social environment (i.e., high versus low pressure to drink, respectively).

The identification of trait-like factors, such as anxiety, that explain individual differences in *if...then...motive signatures* (patterns of within-person *context-motive* associations) may assist considerably in understand the underlying determinants of drinking motivation, and in particular, why one drinking context may be interpreted differently across individuals. This may have practical utility, in ensuring that motivation based intervention strategies target the right people (e.g., socially anxious; from the finding above), in the right context (e.g., parties), and in the right way (e.g., using strategies designed to reduce the perception and impact of social pressure to drink).

There may also be value in conducting further research to identify distinct groups of people based on their patterns of context-specific drinking motives. For example, a latent class analysis (LCA) of individuals' patterns of *context-motive* associations may reveal groups of people that tend to drink for similar reasons in similar

contexts. The extent to which particular group membership may relate to different personality traits, or drinking outcomes could prove a worthwhile line of inquiry.

Clearly, the outcomes of this thesis demonstrate support for using the CAPS model, and context-specific measures to understand the precise nature of drinking motives. Further, the acknowledgement of this fact presents a unique opportunity to re-evaluate and improve upon previously held (decontextualised) understandings of the motivational pathways underlying alcohol use and harm. In doing so, the second broad aim of the thesis can be addressed: to assess the utility of context specific drinking motives.

## **7.2 Utility of Context Specific Drinking Motives**

In assessing the utility of treating drinking motives as context-specific constructs, the findings regarding different motivational pathways to use and harm are summarised, and the unique role context plays in refining this understanding discussed. Additionally, consideration is made of pathways to alcohol use, outside of drinking motives, that may be important to consider when profiling risk. Implications for practice and research are considered throughout.

### **7.2.1 Motivated Drinking Pathways.**

**7.2.1.1 Socially motivated drinking.** Consistent with past findings (e.g., Kuntsche et al., 2005), drinking for social rewards was found to be the most commonly endorsed motive for drinking amongst young adults. Furthermore, this was found to be the case irrespective of the drinking context. Regarding the main effect (across all contexts) of personality, those high (compared to low) in anxiety and reward sensitivity were more likely to drink to be social. While the link between social motivation and reward sensitivity is consistent with past findings (O'Connor & Colder, 2005; Willem et al., 2012), the link with anxiety is novel. I postulate that individuals high in both

personality traits may place greater importance on positive social experiences compared to others.

The social drinking motive showed the lowest stability of all motives, suggesting that it is highly situation specific—being endorsed most heavily in the party, followed by multi-generational and then home setting, and perhaps highlighting the particularly important role peers play in shaping this motivation.

Although past literature has found social motivation to be linked with moderate levels of use (see section 2.2.2.1; chapter two) the current findings provide an additional qualification. It was found that social motivation was only related to use within the party setting (and this was true for both the generalised and situation specific portions of social motivation). This may be because the social motivation relates specifically to goals of peer bonding or finding a partner of which party settings provide the most opportunity to achieve. It can also be speculated that the formal nature of the multi-generational setting may encourage a type of socially motivated drinking that is light in nature.

Furthermore, social motivation appears harmful solely via the mechanism of increased consumption (i.e., no direct effect of social motivation on harm was found), consistent with past findings (Kuntsche & Kuntsche, 2009; LaBrie et al., 2011; Merrill & Read, 2010; Norberg et al., 2011; Patrick, Lee, et al., 2011; Willem et al., 2012). Finally, there was an indication that the combination of increased use and situational increases in social motivation result in disproportionately high levels of harm.

Consequently, interventions designed to reduce the harmful effects of socially motivated drinking should target consumption primarily, and may be most effective when addressing alcohol use specific to party settings with peers. Those high in sensation seeking and anxiety may also warrant particular attention.

**7.2.1.2 Enhancement motivated drinking.** Being motivated to enhance positive internal experiences appears to be the second most commonly reported drinking motive. This drinking motive, being internally derived, appears less susceptible to changes in the drinking context. As with social motivation, enhancement motivation was most commonly reported in the party, followed by multi then home context, and by those who high (compared to low) in anxiety and reward sensitivity. In support of past findings, enhancement motivation was associated with increased use across all drinking contexts (Kuntsche et al., 2005), however with regard to the situational increases in this motive, this positive effect was weaker in party (compared to other) settings. In explaining these findings, it appears that the unique contribution of enhancement motivation (i.e., when considered in combination with other motives) appears to be largely non-social in nature. This may be why party-specific increases in enhancement motivation result in a weakening of the *motive-use* association. The harm associated with enhancement motivation (like the social motive) appears to operate completely via increased use. Additionally, the enhancement motive also appears to be particularly risky when combined with high alcohol use (i.e., getting really drunk, and being highly enhancement motivated appears to be a particularly dangerous mix).

Broad intervention strategies that work to reduce alcohol consumption (such as controls on alcohol marketing, or education designed to challenge positive expectancies) may be most effective in curbing harm associated with enhancement motivated drinking. Strategies particularly directed towards those high in anxiety and reward seeking (such as the cognitive-behavioural and motivational interviewing techniques outlined by Conrod, Castellanos, & Mackie, 2008), and towards avoiding occurrences of high motivation in combination with high use, may be most effective. For example, interventions may encourage young adults to set limits around the amount

of alcohol they are prepared to consume in one sitting, and to implement behavioural control strategies, such as taking less money/alcohol to an event.

**7.2.1.3 *Coping motivated drinking.*** The coping drinking motivation appears less common than the two positively orientated motives above (social and enhancement). While coping motivation is the most stable of all of the drinking motives, still 39% of the variation across contexts cannot be explained by the individual suggesting a reasonable level of context-specificity. The coping motive was most commonly endorsed in the party setting, however, unlike the other motives, coping appears more common at home compared to a multi-generational setting. Drinking to reduce distress may be most easily achieved with close friends, followed by anonymously, and least easily in a formal social setting. This highlights the relatively important role the home context plays in the coping motivational pathway, consistent with past findings linking coping with alcohol consumption both at home (M. L. Cooper, 1994; Kuntsche, Knibbe, et al., 2010) and when solitary (M. L. Cooper, 1994).

As with the other motives, anxiety and reward sensitivity associated with greater coping motivation scores, however punishment sensitivity also predicted coping motivation in this case. Consistent with Gray's theory (1982), individuals high in punishment sensitivity may be particularly cognisant and invested in coping related goals, directed towards the reduction or avoidance of unpleasant internal experiences.

In contrast to the majority of recent literature that finds no clear link *coping-use* link (Crutzen et al., 2010; V V Grant et al., 2007; Hauck-Filho et al., 2012; Mezquita et al., 2010; Németh, Urbán, et al., 2011; Norberg et al., 2010; Patrick, Lee, et al., 2011; Topper et al., 2011; Willem et al., 2012), in the current research the coping motivation was found to be independently and positively related to use. However, consistent with the generally held view amongst motive researchers (Kuntsche et al., 2007a; LaBrie et al., 2007; Merrill & Read, 2010), evidence was found that coping motives relate to

increased harm, not only via a mechanism of increased consumption, but also directly. However the present findings contribute an additional layer of understanding to this process. After controlling for the effect of consumption, the direct *coping-harm* association was found to be particularly strong within multi-generational (compared to other) settings. Put another way, whilst uncommon, coping motivation within multi-generational settings may be intrinsically riskier (outside of use), compared to other settings. Additionally, as with the motives above, a combination of high use and high coping motivation appears particularly harmful.

In summary, the coping motivational pathway is complex. Coping motivation (which also associates with use) is greatest in parties, followed by home, and then multi-generational events. However, although some of the harm associated with coping motivation occurs via use, some also occurs directly (outside of consumption) and this pathway to harm is particularly strong in multi-generational events. Perhaps the social consequences associated with drinking to ‘drown your sorrows’ at formal events are particularly severe or likely, furthermore this may explain why coping motivation is generally low within the multi-generational context in the first place. Interventions aimed at reducing coping motivation directly, perhaps by challenging the unhelpful cognitions that underlie the motive, may be most effective given their direct and indirect (via use) association with harm. Those high in reward sensitivity, anxiety and punishment sensitivity should be specific targets for intervention.

**7.2.1.4 Conformity motivated drinking.** Consistent with past findings, the conformity motive appears to be the least commonly endorsed of the DMQ-R motives. Furthermore, similar to the social motive, it appears to be highly context-specific. This is unsurprising given the externally dependent nature of the conformity reasons for drinking (e.g., to fit in) which may be difficult to achieve in some settings (especially non-social ones). Conformity motivation appears to be more commonly endorsed by

those high in anxiety and reward sensitivity (as was found with all motives), and with punishment sensitivity (as with the coping motive and consistent theory). Furthermore, highly anxious individuals appear to be especially likely to report being motivated to drink to conform in a party setting (compared to home and multi-generational settings). Indeed, the party setting may be a context where social pressure to drink is most keenly felt by young adults.

Regarding outcomes of use and harm, the conformity motivational pathway appears to operate quite differently to the others. Specifically, increases in conformity motivation relate to *less* alcohol use (after controlling for the effect of other motives). These findings are consistent with those reported by others, and may indicate that those generally motivated to drink to fit in tend to consume alcohol in a more conservative way than those who don't feel pressured to drink. Importantly, this research thesis adds the knowledge that situational increases in conformity motivation only seem to relate to less alcohol use within the party setting. Consistent with some findings (e.g., Norberg et al., 2011; Patrick, Lee, et al., 2011) and in contrast with others (e.g., Crutzen et al., 2010; Merrill & Read, 2010) no direct association of conformity motivation on harm was found. In short, conformity motivation appears to have a protective effect (when considered in conjunction with the other drinking motives); relating to decreased harm via reduced use, particularly within the party setting. As a result, interventions specifically targeted towards the conformity motivational pathway may be counter-productive, as noted by others (Gmel et al., 2012).

**7.2.2 'Unmotivated' drinking pathways.** Although motives are typically conceptualised as the most proximal determinants of alcohol use, through which all other factors are funnelled, our findings also support the presence of *unmotivated* drinking pathways (that appear to operate alongside the motivated pathways discussed above). Specifically, our findings suggest that alcohol use remains most strongly

associated with the party, followed by multi-generational, and then home setting, even after controlling for the indirect effect of motives. Indeed, contextual factors outside of people's consciously held motivations to drink (such as friends shouting them drinks, or a habitual drinking response to watching sport on the television) may be important determinants of use, worthy of further investigation and targeted intervention.

While these findings have been presented as evidence of 'unmotivated' drinking pathways, two important caveats are made. First, it is possible that these results simply reflect an underestimation of important aspects of motivated drinking arising from the somewhat generalised way context specific motives were measured (i.e., thinking of *all the times* you drink in A, B, or C). Research utilising experience sampling techniques to gain highly situational measures of drinking motives may provide useful clarification. Second, in describing these drinking pathways as 'unmotivated' I am adopting a somewhat narrow definition of drinking motives as solely consciously held constructs. However, as was highlighted in chapter one, the broader definition also acknowledges the unconscious aspects of drinking motivation, and it would be worthwhile exploring the situation-specific role of these more automatic motives. For example, benefit may arise from building context-specificity into existing measures of implicit drinking motives (Lindgren et al., 2011; Ostafin & Marlatt, 2008).

**7.2.3 Reviewing the role of context.** In summarising the role of context in motivated drinking, it appears that all DMQ-R motives are most commonly endorsed in the party (compared to home and multi-generational) context,. Furthermore, all except the coping motive appear to be more commonly endorsed in the multi-generational setting compared to home.

While it is difficult to identify the key ingredients of context (i.e., the particular situational factors within each of these three contexts that are most important in shaping individuals' drinking motives), based on the finding reviewed above, some speculations

can be made. Parties may offer the greatest opportunity to service goals relating to all motive areas because heavy drinking is both normative and expected, multiple opportunities exist to bond with existing friends as well as to make new ones, alcohol is cheap and easily available, and distractions from everyday problems are both salient and abundant (Clapp et al., 2007). Events involving multiple generations of people—where alcohol is perhaps easily available but the social context is formal and drinking norms are moderate—appear to be more conducive to drinking for social, enhancement, and conformity related reasons compared to the home environment—where little or no social incentive exists, and alcohol use may be perceived by many to be problematic (based on focus group findings; chapter four). However, the coping motivation is somewhat unique. Indeed, ‘drowning one’s sorrows’ may be most easily attained amongst friends (at a party), followed by anonymously (at home alone), and least easily in formal social situations where multiple generations are present.

A primary determinant of risk is alcohol use. Additionally, while it appears that each of the three drinking contexts work on harm via use, in some cases, the context also appears to relate to harm outside of use. Specifically the party setting appears to be somewhat inherently risky and the multi-generational setting inherently safe, per drink consumed. Thus, within the party setting, in addition to targeting reduced consumption, interventions could aim to improve safety via mechanisms outside of consumption (e.g., having a buddy to watch out for you, eating food before drinking, providing increased supervision, and reducing environmental hazards).

**7.2.4 Summary.** Consistent with past literature, our findings suggest that alcohol use and exposure to harm can be usefully, albeit incompletely, explained by a number of distinct motivational pathways: from personality traits (anxiety, reward sensitivity, punishment sensitivity) to drinking motives (social, enhancement, coping, conformity) to alcohol consumption, and then to harm. While current findings relating

to these pathways were generally consistent with past research, several new insights were gained by accepting the proposition that young adult's drinking motives vary from one situation to the next. Thus, in addressing the second broad research aim, the findings of this thesis suggest that drinking motives are more usefully conceptualised and measured as context-specific (i.e., state-like).

Specifically, while past findings have shown social motivation to be related to increased harm via a mechanism of increased use, our context-specific investigation revealed that this motivational pathway may be confined to the party (but not multi-generational or home) context. Also of interest, the positive relationship between enhancement motivation and alcohol use was found to be weaker in the party (compared to the home and multi-generational) context. Regarding the coping motivational pathway, some of the harm associated with coping motivation seems to occur via use, however some also occurs directly (outside of consumption), and this direct pathway appears particularly strong in multi-generational settings. Finally, conformity motivation was found to be particularly protective within the party (compared to home and multi-generational) contexts.

While these preliminary findings remain somewhat limited in practical utility, they do highlight the potential value of using context-specific motives to improve our ability to identify motivational pathways to use and harm, to model risky drinking situations, and to provide interventions targeted towards the right individuals in the right situation. Furthermore, a great opportunity exists to significantly expand our understanding of situated drinking motivations with future studies that employ experience sampling methods to gain more precise measures of situated drinking motives..

### 7.3 Limitations and Future Research

Despite there being clear promise in identifying personalised *if...then...motivational signatures*, it should be noted that study three failed to find any significant individual differences in the way the drinking context related to most motives (i.e., social, enhancement, and coping). While this may reflect a true lack of individual variability in the way young adults make sense of (and are motivated by) various drinking contexts, the focus group findings give reason to doubt this conclusion. Recall the complex and often individualised reasons provided by participants for drinking in response to various contextual factors (chapter four). Instead, it is highly likely that the somewhat generalised way in which context-specific drinking motives were measured (i.e., “thinking of *all the times* you drink at a party... etc.) has reduced the sensitivity of this measure, and limited the ability to identify individual differences in context-specific motivations. Indeed, the fact that motives were not measured in a purely state-based way represents an important limitation of the current thesis, requiring further exploration.

Given that motives appear to have fundamentally transient properties, one’s drinking motives may not only change across drinking contexts (e.g., from a party to the home), but also *within* drinking contexts (e.g., from one party to the next party). As a result, motives should ideally be measured repeatedly, and as close as possible to each drinking episode to obtain greatest accuracy. With this in mind, future research may be able to gain a much more precise and situation-specific understanding of drinking motivation by employing experience sampling techniques, perhaps via the use of smart phone applications, to obtain participant ratings at a range of times preceding drinking events. In doing so, researchers can better explore the role motives play in alcohol outcomes, *within each moment*. This may also significantly improve researchers ability to identify risky situations and provide tailored interventions. For example, smart phone

applications may be able to identify risky situations specific to each individual based on his/her unique pattern of responding, and provide real time interventions in the form of tailored feedback, motivational prompts and / or access to supports designed to improve decision making and to minimise exposure to harm.

Another important limitation relates to the exhaustiveness in which context was measured and investigated. Although it was demonstrated quantitatively that differences exist in motive endorsement across the home, party and multi-generational contexts, what still remains uncertain is the role played by alternative contexts (such as a bar or restaurant), and indeed what specific aspects of each context are important in shaping drinking motives (such as the level of intimacy or emotional state). Indeed, having provided a proof of concept that drinking motives are context specific, the next important step is to conceptualise these key ingredients of context. While some speculations are made in this chapter regarding the potential key ingredients underlying the party, home and multi-generational contexts, a more detailed and systematic investigation is warranted. Experience sampling methods may assist in this regard also, by enabling researchers to unpack the important determinants of context over an extended sampling period. Experimental research designs, that allow for the systematic manipulation of context variables may also be informative.

Finally, while the theory underlying *if...then... signatures* suggests that important features of the context will shape the drinking motives of individuals, it is important to acknowledge that the cross-sectional nature of the current findings prevent causal conclusions from being made. Indeed, given the proposed involvement of a complex network of cognitive-affective units (outlined by the CAPS system) in motivated drinking, it is possible that unmeasured confounds have contributed in uncertain ways to our findings. The direction of any hypothesised influence is also uncertain. For example, the party context may elicit drinking motivations, alternatively

the drinking motivations may elicit the attendance of parties, or, perhaps most likely, a combination of both mechanisms may occur.

#### **7.4 Conclusion**

This thesis has extended our knowledge of the nature and utility of drinking motives through an investigation of the role of context in young people's drinking. Indeed, both empirical and theoretical evidence was presented in support of the hypothesis that the motives underlying young people's drinking are somewhat transient, state-like constructs, that are best conceptualised and measured in a context specific way. Furthermore this thesis found preliminary evidence to suggest that young adults display somewhat personalised patterns of context-specific drinking motives (or *motivational signatures*) in a manner consistent with Michel's CAPS theory of personality (Mischel & Shoda, 1995). For example, it was found that some people tend to be more motivated to drink to conform in parties than others, and in particular, those who are highly anxious.

Importantly, our findings suggest that context specific understandings may improve the accuracy in which risk can be modelled, and effective interventions and therapies be implemented. Indeed, by considering the context specific patterns of motivation underlying particularly problematic drinking behaviour researchers and clinicians will be better able to implement the right strategy, for the right individuals, in the right situation.

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## Appendix A. Summary of Studies Comprising the Systematic Review.

Table A1

### *Summary of Qualitative Studies*

Authors and country of study	Main aim/research questions	Design	Sample	Methodology (including measures used)	Summary of evidence/findings
Coleman and Cater (2005a)	- What motivates young people to 'binge' drink?	Cross-sectional design.	64 young people (14-17 years) with some experience of binge drinking	One-to-one interviews  Semi-structured interview probing participants' introduction to alcohol, motives to drink and outcomes associated with drinking.	- Main motives identified: social facilitation, individual benefits (such as the 'buzz') and social norms/influence. - Negative consequences for health, and personal safety appear directly linked to binge drinking, however these must be balanced against the significant pleasures participants experience as a result of binge drinking. - Underage drinking appears to be riskier due to the lack of supervision in these contexts.
Dodd et al. (2010)	- To identify the subjective benefits and barriers to high-risk drinking in an underage student population.	Cross-sectional. Same gender focus groups (4 male and 3 female)	59 university students (under 21 years of age) who had consumed more than 5 drinks in one sitting in the past fortnight	Quantitative measures: - alcohol related problems via the Alcohol use Disorders Identification Test (AUDIT)  Semi-structured questioning of student motives for drinking to excess, deterrents of alcohol use, psycho-social gender differences concerning drinking, where students receive alcohol-related information.	- Common reasons identified for high-risk drinking included: 'for fun', 'to celebrate', to 'relieve stress' and for males 'to relieve boredom' and 'to test their drinking limits'. Participants also drank for social lubrication, due to peer influence, and as a rite of passage. - Males spoke about matching their alcohol consumption to that of their partner's to optimise their opportunity for intimate interactions. - Deterrents to drinking to excess included potential negative social consequences such as embarrassment or regretful behaviour.
Palmqvist (2006)	- To identify groups of adolescents based on alcohol use - To identify the reasons given by adolescents for their own and others drinking. - To identify drinking motives that characterise membership to each alcohol use category.	Mixed methods. Cross-sectional survey design with quantitative and qualitative components	488 adolescents aged 14-16 years.  Mean [SD] age was 14.13 [0.44] years.	Survey measures: - own and others primary reason for drinking (open ended questions with responses classified into 8 (own reasons), or 10 (others reasons) categories (based on Rauste von Wright, Makkonen, & Markkanen, 1986)) - drinking behaviour (frequency and quantity)  Data analysis: - Cluster analysis to determine groups based on alcohol use variables. - Descriptive statistics were provided as a way of characterising each alcohol usage group.	- Three distinct adolescent groups were identified based on alcohol usage: non-users 53%, occasional users 33.8%, and frequent users 11.9%. - Drinking to get drunk and to have fun were most commonly reported reasons for self-drinking. - Drinking for stress relief and for fun were most commonly reported reasons for others drinking. - Frequent drinkers more commonly reported drinking to get drunk, and less commonly to have fun, than occasional drinkers. - Frequent drinkers believed that others drink to get drunk more commonly than did occasional drinkers. Conversely, occasional drinkers believed that others drank to reduce stress more commonly than did frequent drinkers.

Table A2

*Summary of Studies that Measured Individual Reasons for Drinking*

Authors and country of study	Main aim/research questions	Design	Sample	Methodology	Measure of reasons for drinking	Summary of relevant evidence/findings
Fraga et al. (2011) Portugal	- To describe the frequency and determinants of alcohol use in Portuguese teens.  - To qualitatively analyse perceptions of underage drinking, the consequences of drinking, and motives for drinking.	Mixed methods design.  - Cross-sectional survey - Semi-structured interviews.	Survey: 2036 13 yr old students  Interviews: 30 students aged 13 years old  Data obtained as a part of the EPITeen program in Portugal.	Survey measures: - reasons for drinking - alcohol consumption - perceptions about drinking - proximity to other alcohol users - tobacco use - involvement in physical activity  Interview: - perceptions of alcohol use, motives for drinking, and consequences of alcohol consumption.  Data analysis: - Logistic regression to determine odds of drinkers belonging to various demographic groups, relative to non-drinkers.  Qualitative: -content analysis	No specific instrument name (no specific author indicated)  Survey: - participants asked to identify relevant reasons for drinking from a list of 10 reasons - of these, participants were instructed to nominate the most important reason.	Quantitative findings: - 50% of girls and 44.9% of boys had experimented with alcohol, and – in order of frequency – consumed alcohol at home (56.4%), parties (21.8%) and bars (21.8%). - the most common reason for drinking was ‘curiosity’ for infrequent alcohol users, and ‘taste’ for more frequent users.  Qualitative findings: - 3 motives were identified, and were reported in the following order of frequency; coping, social and conformity. - differences in drinking reasons between frequent and infrequent drinkers were not reported.  - A range of social, psychological and physical consequences and risk taking behaviours were identified by participants, and these mainly related to acute and heavy alcohol use.  - few gender differences were found.
Kuntsche and Gmel (2006) Switzerland	- To investigate trends in prevalence and reasons for drinking and their association with alcohol use in a Swiss adolescent population from 1994 to 2002.	Repeated cross-sectional survey  Questions administered as part of the Health Behaviour in School-Aged Children (HBSC) survey.	3,792 8th and 9th grade alcohol using students.  1994 sample (n = 1254)  2002 sample (n = 2538)	Survey measures: - reasons for drinking - drunkenness - alcohol consumption  Data analysis: - group comparisons using chi-square analyses. - stepwise multiple regressions to assess the influence of gender, year of study and reasons for drinking on alcohol use and drunkenness.	No specific instrument name (items based on Billingham, Parrillo, & Gross, 1993; Haden & Edmundson, 1991; Plant, Bagnall, & Foster, 1990; Smith, Abbey, & Scott, 1993)  “I drink alcohol because...” followed by 8 yes/no response items.	Most common reasons for drinking were to celebrate, wanted to try alcohol and liked the taste, across both years of study.  Participants reported more reasons for drinking in 2002 compared to 1994, especially regarding the taste, the effects associated with alcohol and because it is legal. There was also an increase in alcohol use and drunkenness of this time period.  - Drinking reasons explained 3 times as much variance in alcohol use and drunkenness than demographics and year of study alone.  - Drinking for the effects of alcohol was the reason most strongly predicting drunkenness.

Authors and country of study	Main aim/research questions	Design	Sample	Methodology	Measure of reasons for drinking	Summary of relevant evidence/findings
Patrick and Schulenberg (2011)  United States	- To determine the growth trajectory of reasons for drinking and alcohol use of young people aged 18-30 years. - To consider the relationship between these two trajectories - To determine whether demographic variables moderate the above relationships.	Longitudinal survey design  Data from Monitoring the Future (MTF; Johnston, O'Malley, Bachman, & Schulenberg, 2009) including data collected from 1976 to 2007.	9,308 alcohol using people aged between 18-30 years, surveyed up to six times between 1976 and 2007.	Survey measures: - reasons for drinking - binge drinking (5+ drinking)  Data analysis: - latent growth modelling to determine the relationship between growth trajectories of reasons for alcohol use and binge drinking	No specific instrument name (items based on Johnston & O'Malley, 1986)  "What have been the most important reasons for your drinking alcoholic beverages?" with 14 dichotomous yes/no response items.	- 5 most frequently endorsed reasons for drinking: to relax, have a good time with friends, feel good/high, get away from problems, and boredom.  Reasons for drinking change developmentally: - drinking to relax was the only drinking reason to increase across young adulthood, with most reasons declining from the initial assessment at 18 years old (drinking to get away and for boredom ) or after peaking at around age 22 years (to have a good time and to get high). - at age 18 participants most frequently endorsed drinking for a good time, to get high, for boredom and to get away. By age 30 the order of reasons endorsed was to relax, to get high, to get away and for boredom.  - Changes in reasons for drinking correlated positively with changes in binge drinking over time. - in early adulthood, drinking to get high and to have a good time emerged as strongest predictors of increased binge drinking, whereas in later young adulthood drinking to escape most strongly predicted binge drinking. - very limited evidence that demographic variables moderate the trajectories or relationships described above.  -Suggests that different reasons are important predictors of binge drinking at different developmental periods.
Patrick, Schulenberg, et al. (2011)  United States	- To explore the associations between reasons for alcohol and marijuana use at age 18, with substance use at age 18 and 35, and with substance use disorders at age 35 years.	Longitudinal, prospective survey study  Data collected as a part of the Monitoring the Future study.	2,311 alcohol, and 1,015 marijuana using high school seniors were surveyed at age 18yrs. Fifty-seven percent completed a follow-up survey at age 35 years.	Survey measures at age 18: - reasons for alcohol use and marijuana use - alcohol use and heavy episodic drinking - marijuana use  Survey measures at age 35: - alcohol use disorder (AUD) and marijuana use disorder (MUD).  Data analyses: - correlation, multiple regression, and logistic regression analyses to test links between reasons for substance use and disorders.	No specific instrument name (based on items developed by Johnston & O'Malley, 1986)  "What have been the most important reasons for drinking alcoholic beverages? (mark all that apply)" followed by 13 dichotomous (yes/no) response options.  response options summarised into 4 categories (social/recreational, negative affect, compulsive, drug effect) however analyses were conducted at the level of individual reasons.	- Categorical groupings of drinking did not represent discrete factors as is reflected by high inter-correlations (especially social/recreational) – no factor analysis was conducted.  - Alcohol use and reasons for drinking at age 18 predicted concurrent heavy episodic drinking and AUD 17 years later (irrespective of gender).  Social/recreational reasons: - commonly reported and good predictors of increased alcohol use generally. - drinking to get high at 18 resulted in an increased odds of heavy episodic drinking and AUD at age 35. - drinking for boredom at 18 predicted increased AUD at age 35.  Coping reasons: - less common but also predicted drinking problems. - drinking to relax and for anger/frustration predicted current binge drinking, and AUD at age 35. - drinking to get away from problems and to get through the day predicted less AUD at age 35 (unexpectedly).  Compulsive reasons: - predicted current binge drinking only  Drug effects: - predicted current binge drinking. - drinking to increase the effect of other drugs predicted increased AUD at age 35.

Table A3

*Summary of Studies that used Existing Multi-factor Motive Measures*

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Anderson et al. (2011)  United States	<p>- To explore the relationships between students motives to drink and to abstain from drinking (study 1), and their positive and negative alcohol expectancies (study 2), in predicting alcohol use.</p> <p>- To describe differences in motives to abstain from drinking across grade levels and demographic characteristics.</p>	Two cross-sectional surveys	<p>Study 1: 1069 Catholic school children (Mage=15.6, SD=1.2)</p> <p>Study 2: 1582 school children (Mage=15.9, SD=1.2)</p>	DMQ-R (social, enhancement, coping, conformity) (study 1 only)	<p>Study 1: Survey measures: - drinking motives - motives to abstain from alcohol (Motives for Abstaining from Alcohol Questionnaire; MAAQ) - alcohol use (lifetime, current, 4+ drinking) - alcohol related problems (physical, school, relationship, legal, or social)</p> <p>Study 2: Survey Measures: - alcohol use (as for study 1) - motives not to drink - alcohol expectancies (for drinking and for not drinking) - (no measure of drinking motives)</p>	<p>- Only coping motives were associated with heavy episodic drinking.</p> <p>- Motives to abstain were negatively correlated to all drinking motives.</p> <p>- For drinking initiation and current alcohol use, motives to abstain were protective for those with low (but not high) social motives. This suggests that social motives may be more salient than motives to abstain for adolescents.</p> <p>- Unexpectedly, adolescents highly motivated to abstain from alcohol, were less likely to drink if they had strong (compared with weak) motives to drink to cope.</p> <p>- Motives to drink and not to drink interact.</p>
Arbeau et al. (2011)  Canada	<p>- Are daily drinking motives influenced by situational and trait-like factors?</p> <p>- To determine whether daily negative affect and trait sensation seeking would uniquely predict the extent to which daily drinking was coping or enhancement motivated.</p> <p>- To determine whether daily task accomplishment and trait conscientiousness would uniquely predict the extent to which daily drinking was coping or enhancement motivated.</p>	Initial survey followed by 2 week daily process design	81 alcohol consuming university students	<p>Baseline: - DMQ-R (enhancement &amp; coping only)</p> <p>Daily: - DMQ-R (enhancement &amp; coping only)</p>	<p>Level 2. Between subjects measures (trait-like variables): - drinking motives - sensation seeking - conscientiousness - typical alcohol use</p> <p>Level 1. Daily measures (situational variables): - daily drinking motives - daily mood - daily level of task accomplishment</p> <p>Data analysis: - hierarchical multilevel modelling to assess daily and trait influences on daily drinking motives.</p>	<p>- Motives were endorsed in the following order of frequency when measured as a trait and situationally (daily): social, enhancement, coping, conformity.</p> <p>- Between-subject factors accounted for one third, and one quarter, of the explained variance in daily enhancement and coping motivated drinking respectively, supporting the view that motives vary according to context.</p> <p>- Unique situational and trait-like variables predicted daily coping and enhancement motivated drinking.</p> <p>- daily enhancement motivation was predicted by trait enhancement motivation, trait sensation seeking (uniquely), and daily positive affect.</p> <p>- Daily coping motivation was predicted by trait coping motivation, daily negative affect (uniquely), and negatively by daily positive affect.</p> <p>- Interaction effects indicated that high (but not low) sensation seekers, and those high (but not low) in conscientiousness, drank increasingly for enhancement as a function of their daily task accomplishment. That is, highly conscientious and sensation seeking young adults appear to drink to enhance positive emotion to a greater extent when they have had a particularly productive day.</p> <p>Situational drinking motives should be reconceptualised as partly predicted by between subjects (trait) and within subjects (situational) antecedents.</p>

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Armeli et al. (2010) United States	- To determine whether drinking motives moderate the within-person relationship between anxious and depressive affect and alcohol use.	Longitudinal research design employing survey and experience sampling methods.  Baseline survey and 30-day daily diary measure each year for up to 4 years.	530 undergraduate alcohol consuming students. Mean age [SD] was 18.88 [1.14] years.	DMQ (social-enhancement, coping)	Baseline measures each year: - drinking motives - retrospective depression and anxiety symptoms - retrospective drinking level  30-day daily diary measures: - daily alcohol use - daily negative affect  Data analysis: - multilevel regression models to test the proposed moderation model at the month-level and day-level of analysis.	- Evidence that high social-enhancement drinking motives exacerbate the positive relationship between monthly negative affect and drinking frequency (but not quantity). - The opposite effect was observed at the daily level of analysis. That is, those high in social-enhancement motives tended to drink less on days of increased depressive affect. - Only weak evidence for an equivalent moderating effect of coping motives on the same relationship
Armeli et al. (2008) United States	- to explore whether coping motives moderate the effect of daily negative mood states on subsequent alcohol use.	Longitudinal study design, with survey and daily process measures taken 2 years apart.	458 undergraduate students (Mage = 18.77, SD = 1.09).	DMQ-R (social-enhancement and coping)	Initial survey measures: - drinking motives - drinking level (frequency, drunkenness, quantity)  Daily process measures (30 day period): - daily alcohol use - daily mood  Analyses: - multilevel discrete-time hazard models were estimated to examine how mood states and coping drinking motives were related to weekly drinking.	- Given a high correlation between social and enhancement motives ( $r = .76$ ), these motives were combined to form a social-enhancement motive. - Those high in coping motives started drinking earlier in the week on high anxiety weeks, than those low in coping motives. On weeks low in anxiety this difference was not observed. - The opposite effect was found for anger; those high in coping motives started drinking later in the week during high anger/frustration weeks, compared to those less motivated to drink to cope. - The measurement of time-to-drink, uncovered relationships between daily mood events and alcohol use that would otherwise be overlooked.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Birch et al. (2008) Canada	- to investigate the effect of emotions and drinking motives on implicit drinking related cognition.	Experimental design with random assignment of participants to conditions.  Study 1: 2×2 Mood (positive, negative) by Drinking Motives (enhancement, coping) by Target Type (alcohol related, non-alcohol related)  Study 2: 2×2×4 Mood (positive, negative) by Drinking Motives (enhancement, coping) by Attribute-Target Association (reward-alcohol, relief-alcohol, reward-non-alcohol, relief-non-alcohol)	Psychology undergraduates who had been screened (using the DMQ-R) as being either enhancement (EM) or coping (CM) motivated drinkers  Study 1: n = 81 Study 2: n = 79	DMQ-R (enhancement & coping)	Method: - participants were exposed to music to induce either a positive or negative mood, then:  Study 1 – participants completed a measure of attention to alcohol targets (Stroop test). Longer colour-naming latencies indicate greater 'activation' of target words.  Study 2 participants completed the Extrinsic Affective Simon Task (EAST; a test of associative categorisation). Faster response times in categorising target words indicates stronger intrinsic associations.  Measures: - drinking motives - drinking problems (Rutgers Alcohol Problem Index) - current mood state (Visual analogue scales)  Data analysis: - analyses assessing significance of mean group differences.	Study 1: - consistent with hypothesis, enhancement (but not coping) drinkers maintained implicit activation for alcohol cognition when in a positive mood. The equivalent effect, that negative mood would activate implicit alcohol processing for coping drinkers, was not found.  Study 2: - all groups had stronger reward-alcohol than relief-alcohol associations at baseline. - the enhancement drinkers maintained stronger reward-alcohol vs. relief-alcohol associations when positive mood was induced (compared to coping drinkers). The equivalent effect, that negative mood would result in stronger relief-alcohol vs. reward-alcohol associations in coping drinkers compared to enhancement drinkers, was not found.  Overall: - positive mood activates or maintains implicit attention to alcohol cues and associations between reward-alcohol cognitions, for enhancement but not coping motivated drinkers. - No evidence of the equivalent effect for coping drinkers was found – i.e., that negative mood activates implicit attention to alcohol cues or associations between relief-alcohol cognitions.
Blumenthal et al. (2010) United States	- To examine the relationship between social anxiety and drinking motives. - The authors hypothesised a positive link between social anxiety and the coping motive.	Cross-sectional survey	50 alcohol using adolescents with mean [SD] age of 16.35 [1.1] years.	DMQ-R (social, enhancement, coping, conformity)	Measures: - drinking motives - affective problems (depression/dysthymia) - social anxiety (social phobia subscale of the Revised Child Anxiety and Depression Scale )  Data analysis: - t-test for significance of group differences - hierarchical multiple regression to test relationships between motives and social anxiety.	- Motives were endorsed by participants with the following frequency (high to low): enhancement, social, coping and conformity.  - No gender differences regarding motives or social anxiety were observed. - social anxiety was related to depression ( $r = 0.54$ ) and to coping motives ( $r = 0.47$ ), and this SA-coping link remained significant when controlling for demographic and alcohol use variables. - social anxiety was not related to other drinking motives (cf Buckner et al., 2006, who found SA-enhancement link)  - Evidence suggesting that a socially anxious subgroup of the adolescent population may drink to cope more than their peers.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Buckner et al. (2006) United States	<ul style="list-style-type: none"> <li>- To examine the relationships between social anxiety, alcohol use and alcohol related consequences.</li> <li>- To examine whether drinking motives and drinking situations (i) moderate or (ii) mediate the link between social anxiety and drinking behaviour.</li> </ul>	Cross-sectional survey	293 alcohol using college students with mean [SD] age of 20.4 [2.9] years.	DMQ (social, coping, enhancement)	<p>Measures:</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- social anxiety (Social Interaction Anxiety Scale)</li> <li>- alcohol use</li> <li>- alcohol related problems</li> <li>- drinking situation (unpleasant emotions, physical discomfort, pleasant emotions, testing personal control, urges and temptations to use, conflict with others, social pressure to use, pleasant times with others).</li> </ul> <p>Data analysis:</p> <ul style="list-style-type: none"> <li>- correlation and hierarchical regression analyses were used to test the associations between variables.</li> </ul>	<ul style="list-style-type: none"> <li>- Social anxiety was related to alcohol problems but not via increased alcohol use.</li> <li>- Social anxiety was positively related to enhancement, but not coping or social motives, suggesting that people with social anxiety drink to enhance positive emotion rather than reduce negative ones (in contrast to Blumenthal et al., 2010).</li> <li>- Those with social anxiety were more likely to drink in situations involving unpleasant emotions, conflict with others, perceived social pressure and testing personal control.</li> <li>- No moderation effects were found to explain the inconsistent effect of social anxiety on drinking behaviour found previously.</li> <li>- enhancement motives were found to mediate the social anxiety-problematic drinking behaviour link.</li> </ul>
Catanzaro and Laurent (2004) United States	<ul style="list-style-type: none"> <li>- To explore the link between personal coping resources (perceived family support, and negative mood regulation expectancies) and alcohol use.</li> <li>- To explore the mediation and moderation effects of coping motives on the above relationships</li> </ul>	Cross-sectional survey design	210 year 9-12 students with mean [SD] age of 18.5 [1.1] years,	DMQ-R (coping only)	<p>Survey Measures:</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- perceived family support (cohesion, expressiveness, and conflict)</li> <li>- alcohol outcome expectancies</li> <li>- avoidant coping style</li> <li>- negative mood regulation expectancies</li> <li>- alcohol use</li> </ul> <p>Data analyses:</p> <ul style="list-style-type: none"> <li>- hierarchical multiple regression to test for relationships between variables.</li> </ul>	<ul style="list-style-type: none"> <li>- Coping motives mediated the positive link between tension reduction expectancies and all measures of alcohol use.</li> <li>- The two coping resources of interest (perceived family support, and perceived ability to regulate negative moods) acted as protective factors for alcohol use, and were negatively linked to coping drinking motives.</li> <li>- Those with avoidant coping dispositions and high tension reduction expectancies, had higher coping motives, which may explain their stronger perceived ability to regulate negative mood.</li> <li>- Adaptive coping resources buffered the influence of predictor variables on drinking to cope and drunkenness (supporting the stress-vulnerability model)</li> </ul>

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Chalder et al. (2006) South Wales	<ul style="list-style-type: none"> <li>- To investigate the influence of parental alcohol problems on adolescents' alcohol use and drinking motivations.</li> <li>- Do adolescents with and without parents with alcohol problems differ with regard to alcohol use and drinking motives?</li> <li>- Prediction 1: those with parents with alcohol problems would report increased internal motives to drink (coping and enhancement).</li> <li>- Prediction 2: the relationship between parental alcohol problems and alcohol use would be moderated by internal motives to drink.</li> </ul>	<p>Cross-sectional survey design.</p> <p>Sample drawn from the Teenage Alcohol Project (TAP)</p>	<p>1744 students from 9 secondary schools in South Wales</p> <p>Mean [SD] age was 13.7[0.7] years.</p>	<p>DMQ-R (social, enhancement, coping, conformity)</p>	<p>Survey measures:</p> <ul style="list-style-type: none"> <li>- parental alcohol problems (Children of Alcoholics Screening Test; CAST-6)</li> <li>- alcohol consumption (7 day drink diary)</li> <li>- socioeconomic status (Family Affluence Scale and other items assessing family affluence)</li> </ul> <p>Data analysis:</p> <ul style="list-style-type: none"> <li>- ANOVA and <math>\chi^2</math> for group differences</li> <li>- Confirmatory factor analysis to verify structure of DMQ-R</li> <li>- Hierarchical multiple regression to assess moderation effect of internal drinking motives on the relationship between parental alcohol problems and alcohol use.</li> </ul>	<ul style="list-style-type: none"> <li>- Parental alcohol problems were positively related to all measures of adolescents' alcohol use.</li> <li>- Adolescents with parents with alcohol problems showed greater internal motives for drinking (enhancement and coping) than adolescents with other backgrounds.</li> <li>- all motives to drink (not just internal ones) moderated the positive relationship between parental drinking problems and adolescent alcohol use, such that: <ul style="list-style-type: none"> <li>- social, enhancement, and conformity motives exacerbated the relationship between parental drinking problems and adolescent drinking frequency.</li> <li>- only coping motives exacerbated the influence of parental alcohol problems on the quantity of alcohol consumed by adolescents. Conformity motives attenuated this link.</li> </ul> </li> <li>- Factor structure of the DMQ-R was supported</li> <li>- males showed stronger conformity motives than females (no gender difference found for other motives).</li> <li>- General support for the contention that internal (and possibly external) drinking motives moderate the effect of parental drinking on adolescent alcohol use.</li> </ul>
M. L. Cooper et al. (2008) United States	<ul style="list-style-type: none"> <li>- To examine race differences (black vs white) in coping and enhancement motives over the transition from adolescence to adulthood,</li> <li>- To explore the effect of the above relationship on differences in alcohol consumption trajectories over the same period.</li> </ul>	<p>Longitudinal study design</p>	<p>Time 1 (T1): 1,357 alcohol using students (Mage = 17.3 years)</p> <p>Time 5 (T5) 224 students (Mage = 27.9)</p> <p>* 338 participants over 27 yrs old were excluded at Time 4.</p>	<p>DMQ-R (coping and enhancement only)</p>	<p>Measures:</p> <ul style="list-style-type: none"> <li>- drinking motives (T1 to T3)</li> <li>- alcohol use (usual alcohol use, 6-mth alcohol use, and 6-mth frequency of 5+ drinking)</li> <li>- drinking problems: <ul style="list-style-type: none"> <li>- at T1; five items assessing problems with parents, friends, dating partners or school or work.</li> <li>- at T2; Michigan Alcoholism Screening Test measuring problems with relationship partner, family and work and symptoms of dependence and treatment seeking.</li> </ul> </li> </ul> <p>Data analysis:</p> <p>Multilevel Random Coefficient (MRC) models and Ordinary Least Squares (OLS) regression to examine growth characteristics and relationships.</p>	<ul style="list-style-type: none"> <li>- General trends: <ul style="list-style-type: none"> <li>- Alcohol use, drinking motives, and drinking problem trajectories followed an inverted 'U' trajectory.</li> <li>- specifically, drinking problems peaked at around age 20, enhancement motives and heavy drinking peaked at around age 22, and coping motives peaked at around age 24.</li> </ul> </li> <li>- Race differences were observed: <ul style="list-style-type: none"> <li>-black drinkers consumed less than white drinkers initially, however this trend had reversed by early adulthood with black drinkers showing a reduced decline in use over time.</li> <li>- Similarly, black drinkers were more likely than white drinkers to maintain alcohol related problems and coping drinking motivations across time despite having generally lower initial levels.</li> <li>- Coping motives better predicted alcohol use for black compared to white drinkers, over time.</li> <li>- conversely, enhancement motives better predicted alcohol use for white compared to black drinkers, over time.</li> </ul> </li> <li>- Authors conclude that this provides evidence that "drinking is differentially rooted in the regulation of negative and positive emotions among Black and White drinkers, respectively" p496</li> </ul>

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Cox, Hosier, et al. (2006)  United Kingdom	- To test the ability of drinking reasons to predict drinking problems. - To assess the effect of age on the above relationship. - To compare these findings with those found in the United States.	Cross-sectional survey design	328 secondary-school and 74 university students.  Age groups: 13-14 yr olds (n=92) 15 yr olds (n=136) 16-18 yr olds (n=100)  18-21 yr old university students (n=74)	Reasons for Drinking Questionnaire (positive reasons, negative reasons)	Survey measures: - drinking motives / reasons - alcohol consumption - alcohol-related problems  Data analysis: - Hierarchical multiple regression analyses to determine relationships of variables.	- For university and school students, negative reasons for drinking were more predictive of alcohol use and alcohol-related problems than positive reasons for drinking. - For younger students, alcohol consumption better predicted alcohol-related problems, while for older students negative reasons for drinking better predicted alcohol-related problems.  Mediations: - The relationship between positive and negative reasons for drinking and alcohol-related problems was partly mediated by alcohol consumption, in both age groups. - However, for the older students, the relationship between negative reasons for drinking and alcohol-related problems was less related to their level of consumption than for younger students,
Crutzen et al. (2010)  Netherlands	- To determine whether drinking motives moderate the potential relationship between stress and alcohol use.	Cross-sectional survey design	179 university students. Mean [SD] age was 22.6 [2.7] years.	DMQ-R (social, enhancement, coping, conformity)	Survey measures: - drinking motives - alcohol use - stress - alcohol-related problems (regretted/risky sexual intercourse, victim of crime, fights, damaged property)  Data analysis: - Hierarchical multiple regression to test the relationship between variables.	- Stress did not predict alcohol use or alcohol-related problems. - Drinking motives did not moderate the (non-existent) link between stress and alcohol use. That is, there is no support for the tension reduction model that posits that people drink to cope with stress.  - Conformity motives were the strongest predictors of regretted sexual experience, suggesting that those who drink to avoid peer rejection may engage in sexual intercourse for similar reasons. - Coping motives also (moderately) predicted regretted sexual activity and other alcohol related problems (weakly).  - Males more likely to experience alcohol related physical problems than females. - Tension reduction explanations of stress-related effects on alcohol may be inadequate.
Digdon and Landry (2013)  Canada	- To determine whether a preference for waking up early predicts motives for drinking.	Cross-sectional survey design	219 university students with a mean [SD] age of 21.80 [6.80] years.	DMQ-R (social, enhancement, coping, conformity)	Survey measures: - drinking motives - preference for waking early - sleep quality - coping styles (problem-focused, emotion-focused, avoidant-focused) - desirable responding (self-deception)  Data analysis: - Comparison of group differences, and regression analyses to test relationships.	- Social motives were endorsed most frequently, followed by enhancement, coping and conformity motives.  As expected: - An evening (compared to morning) preference predicted all drinking motives, and particularly drinking to cope.  - Drinking to cope was predicted by poor sleep quality, social drinking, and avoidant coping strategies.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Engels et al. (2005)  Netherlands	<ul style="list-style-type: none"> <li>- To test whether specific drinking motives mediate the hypothesised association between positive alcohol expectancies and alcohol use in specific situations</li> <li>- To test whether negative expectancies and self-efficacy are directly related to alcohol use in specific environmental contexts.</li> <li>- To explore moderator effects of age and gender on the associations between drinking cognitions and alcohol use.</li> </ul>	Phase 1: Cross sectional survey  Phase 2: Daily drinking diary for two weeks	553 Dutch adolescents and adults.  Mean [SD] age was 42.2 [18.4] years.	DMQ-R (social-enhancement, and coping-conformity)	Method: Participants completed: - a self-report survey - a 2 week drinking diary  Survey measures: - past 12 mth alcohol consumption (frequency, common drinking situations, 5+ drinking) - alcohol expectancies (positive expectancies regarding social and enhancement effects of drinking; positive expectancies regarding tension reduction; and negative expectancies) - Self-Efficacy (perceived ability to quit drinking after 2 drinks over a in a variety of situations).  Daily drinking diary measures: - daily drinking - situations in which drinks were consumed (pub or disco, party, day time with friends or relatives, after sports, restaurant, dinner at home, alone at home, during visits of friends or relatives)  Analyses: - Hierarchical multiple regression	<ul style="list-style-type: none"> <li>- Unexpectedly, no direct link was found between positive alcohol expectancies and alcohol use. Therefore the hypothesised mediating role of drinking motives could not be tested.</li> <li>- Some support was found for direct links between social-enhancement motives, negative expectancies, and self-efficacy, with all measures of alcohol use.</li> <li>- No support was found for a mediating role of any drinking motives in the above relationships. (cf. Kuntsche et al., 2007; Engels et al., 2005)</li> <li>- Alcohol expectancies, drinking motives and self-efficacy accounted for more variance in general drinking (R<sup>2</sup>s around .23) compared to situational drinking (R<sup>2</sup>s around .1).</li> <li>- No clear moderating effect of gender or age on the above relationships was discovered.</li> </ul>
Feldstein Ewing et al. (2008)  United States	<ul style="list-style-type: none"> <li>- To assess the validity of the Desired Effects of Drinking Scale (DEoDS) with an adolescent sample.</li> </ul>	Cross sectional survey	136 adolescents aged 18-20 years.  Mean [SD] age was 18.7 [0.73] years.	Desired Effects of Drinking Scale (DEoDS)  37-items, 9 categories (assertion, drug effects, mental, negative feelings, positive feelings and self esteem, relief sexual enhancement, and social facilitation)	Survey measures: - drinking motives - binge drinking (5+ drinking) - drinking problems  Data analysis: - exploratory factor analysis	<ul style="list-style-type: none"> <li>- An 8 factor solution was supported (positive feelings/social facilitation, negative feelings/self-esteem, sexual enhancement, relief, assertion, mental, drug effects, fears)</li> <li>- although the overall factors identified were similar to those identified for an adult sample, a number of items loaded differently across sample populations.</li> <li>- fear, emerged as a unique factor in the adolescent sample, whilst the assertion factor was found to relate more to aggression than bravery and power for adolescents.</li> <li>- whilst the internal consistency of the full measure was good (chronbach's alpha = .94), individual factors were less consistent (with all but one factor greater than 0.60)</li> <li>- The full scale score showed a positive relationship with all alcohol use measures, demonstrating some convergent validity.</li> </ul>

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Gmel et al. (2012)  Switzerland	<p>- To investigate potential measurement issues and response biases when investigating the link between motives and alcohol related consequences (after controlling for drinking frequency).</p> <p>Specifically: 1) does the use of raw motive scores (compared to ranked, or Z-standardised scores) influence the observed motives-consequences link?</p> <p>2) is the motives-consequences link influenced by whether participants' perceive the reported consequences to be alcohol related?</p>	<p>Cross-sectional survey</p> <p>Data from European School Survey Project on Alcohol and other Drugs (ESPAD)</p>	<p>5633 students aged 13-16 years old (Mage = 14.6 years old) who had consumed alcohol in the previous year.</p>	<p>DMQ-R (social, enhancement, coping, conformity)</p>	<p>Survey measures: - drinking motives (3 scores for each of the 4 motives scores were constructed: 1. mean raw score, 2. rank based on means, and 3. Z-standardised score)</p> <p>- consequences (fight, problems with friends, trouble with police, regretted sex). Participants were asked whether they had experienced each of these consequences; a) at all, and b) due to alcohol use (alcohol attribution).</p> <p>- frequency of drinking (control variable)</p> <p>Data analysis: - Ordinal logistic regression to assess relationships between motive measures and drinking consequences.</p>	<p>- Irrespective of how drinking motive scores were transformed, the overall pattern of motive endorsement remained constant; social, followed by enhancement, coping and conformity.</p> <p>- boys generally reported more consequences (both alcohol attributed and total) than girls.</p> <p>1) Raw motive scores were all positively linked to drinking consequences (total and alcohol attributed).</p> <p>For ranked and Z-standardised motive scores: - coping motives were generally positively linked with consequences. - social and conformity (external) motives were generally negatively associated with drinking consequences - no clear relationship between enhancement and consequences was observed. - authors suggest that, once drinking frequency is controlled, "consequences may decrease as the preferences for drinking for social motives increase"</p> <p>2) the link between motives and consequences was generally stronger for alcohol attributed consequences (compared to total consequences experienced). - authors argue that total consequences (rather than alcohol attributed consequences) provide the he most 'uncontaminated' measure of consequences.</p>
Goldsmith et al. (2009)  United States	<p>- To test the model predicting that drinking to cope motives and tension-reduction alcohol expectancies mediate the relationship between generalised anxiety and negative-affect heavy drinking.</p>	<p>cross-sectional survey</p>	<p>782 undergraduate student drinkers (413 hazardous drinkers, 369 nonhazardous drinkers). Median age was 19 years.</p>	<p>DMQ (coping only)</p>	<p>Survey measures: - drinking to cope motive - generalised anxiety - tension reduction and worry reduction alcohol expectancies - negative-affect heavy drinking - general alcohol-related problems</p> <p>Data analysis: - structural equation modelling to test proposed model.</p>	<p>In support of the hypothesised model: - alcohol expectancies mediated the generalised anxiety-drinking to coping motives link, and in turn, drinking to cope mediated the alcohol expectancies-negative affect heavy drinking link. I.e., drinking to cope was the most proximal factor through which more distal factors passed.</p> <p>Unexpectedly: - coping motives also mediated the more direct link between generalised anxiety and negative-affect heavy drinking. This suggests that expectancies may not be consciously recognised by student drinkers.</p>

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Goldstein and Flett (2009) Canada	- To examine differences in personality traits and alcohol use among internally motivated (coping, enhancement, and enhancement + coping) alcohol consuming students	Cross-sectional survey.	138 alcohol using university students	DMQ-R (coping & enhancement only)  - Subjects were classified into one of four drinking motive groups based on their DMQ-R scores: coping motivated, enhancement motivated, coping + enhancement motivated, and non-internally motivated	Survey measures: - drinking motives - neuroticism - anxiety sensitivity - sensation seeking - positive and negative affect - alcohol use - alcohol-related problems  Data analysis: - Correlation and analysis of variance to assess variable relationships and group differences.	- Non-internally motivated drinkers were the most populace (62%), followed by coping motivated (17%), enhancement motivated (14%), and enhancement + coping motivated (11%).  Coping motivated drinkers had: - higher levels of negative affect and lower levels of positive affect than other motivated groups. - higher neuroticism than non-internally motivated drinkers, but similar to enhancement motivated drinkers. - higher levels of binge drinking than enhancement motivated drinkers, but similar to coping + enhancement drinkers.  Non-internally motivated drinkers had: - lower alcohol use compared to internally motivated drinking (all other groups).  Coping + enhancement motivated drinkers had: - similar levels of personality traits compared to other groups. - similar levels of alcohol problems compared to coping motivated drinkers.
Valerie V. Grant, Stewart, O'Connor, Blackwell, and Conrod (2009) United States	- To identify unique daily affect-alcohol use relationships for those motivated to drink to cope with anxiety compared to those motivated to drink to cope with depression.	Experience Sampling Method (Daily Process Design)	146 alcohol consuming university students.	Modified DMQ-R (social, enhancement, coping-anxiety, coping-depression, conformity)	Baseline measures: - drinking motives - demographics - drinking problems (RAPI) - mood and anxiety  Daily measures: - daily affect - daily alcohol use  Data analysis: - Hierarchical Linear Modelling to test the within-person associations between daily affect and alcohol use, and to identify the moderation effect of drinking motives on these relationships.	As predicted (when controlling for a number of variables): - coping-depression motivation positively moderated the daily depressed mood-alcohol consumption association. - coping-anxiety motivation positively moderated the daily anxiety mood-alcohol consumption association.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Halim et al. (2012) Australia	- To explore the relationship between social norms (and norm misinterpretation) on drinking motives and alcohol consumption in college students.	Cross-sectional survey	229 college students. Mean age [SD] was 24.35 [8.29] years.	DMQ* (social only)  * response scale was modified from 5-point to 6-point.	Online survey measures: - social drinking motives - alcohol-related consumption. - social norms (proximal injunctive norms—perceived approval of own drinking by close friends; distal injunctive norms—perceived approval of own drinking by typical students; descriptive norms—perceived prevalence of peer drinking)  Data analysis: - Correlations and hierarchical multiple regressions to analyse relationships between variables	Direct effects: - Perceived prevalence of peer drinking was positively related to alcohol consumption. - Perceived approval of drinking from close, but not distant, friends predicted alcohol consumption. - Social drinking motives positively predicted alcohol consumption.  Mediation: - The positive associations between the perceived prevalence of peer drinking, and of close friends' approval of drinking on alcohol consumption, were partly explained by increases in social drinking motives. - Good support that social motives mediate the norms-consumption link.
Ham et al. (2009) United States	- To test the model that negatively reinforcing (coping and conformity) drinking motives mediate the relationship between social anxiety and drinking problems.	Cross-sectional survey	817 college drinkers (Mage = 19.9 years)	DMQ-R (social, enhancement, coping, conformity)	Online survey measures: - drinking motives - social anxiety - drinking problems (quantity/frequency, symptoms of dependence, alcohol-related consequences)  Data Analysis: - structural equation modelling to test the proposed mediation model.	In general, social anxiety was negatively associated with all measures of problematic drinking.  However, as hypothesised: - a positive indirect effect was found linking social anxiety to two of the three measures of problematic drinking, via coping motives. - social and enhancement (positively reinforcing) motives did not play a mediating role in the social anxiety-problematic drinking relationship.  Unexpectedly: - conformity (whilst negatively reinforcing) also did not play a mediating role in the social anxiety-problematic drinking relationship. - These findings explain how social anxiety can be protective for some people and a risk factor for others regarding drinking problems.
Hasking et al. (2011) Australia	- To integrate models of alcohol use into a unitary model. - To test the proposed mediational path in the explanation of drinking behaviour: coping strategies→alcohol expectancies→drinking motives→drinking behaviour.	Cross-sectional survey design	454 students and members of the general public. Mean age 23.68 years.	DMQ (social, enhancement, coping)	Survey measures: - drinking motives - alcohol use and alcohol-related problems (AUDIT) - alcohol-related expectancies - coping styles (problem focused, emotion focused, & avoidant coping)  Data analysis: - regression and path analyses to explore the hypothesised relationships and path model.	- General support was found for the model predicting that avoidant coping strategies predict alcohol expectancies, that alcohol expectancies predict drinking motives, and that drinking motives predict alcohol consumption. - Regression model including coping strategies, alcohol expectancies and drinking motives explained 57% of the variance in alcohol consumption, highlighting the importance of these variables. - All drinking motives were significant predictors of alcohol use even after controlling for the influence of alcohol expectancies and coping strategies.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Hauck-Filho et al. (2012) Brazil	- To evaluate the factor structure of the translated DMQ-R in a Brazilian university student population.	Cross-sectional survey	584 university students with lifetime drinking experience. Mean age [SD] was 23.56 [6.55] years.	DMQ-R translated into Brazilian Portuguese. (social, enhancement, coping, conformity)	Survey measures - drinking motives - alcohol use - alcohol related problems (developed measure: including problems with law, missing classes and fights)  Data analysis: - confirmatory factor analysis to determine the adequacy of the four factor solution proposed by Cooper (1994) - multivariate regression to test discriminant validity of Brazilian DMQ-R.	- Good support found for the four factor solution, after one item "Because you feel more self confident and sure of yourself" was dropped due to poor factor loading.  Findings were generally consistent with those from European and North American countries: - Motives were endorsed in the following order of frequency: social, enhancement, coping, and conformity. - Social and enhancement motives were most closely related to each other, and to alcohol use. - Coping motives were unrelated to alcohol use when controlling for other motives.  Inconsistent with past studies: - After controlling for alcohol use, enhancement, social and coping motives were equally related to drinking problems (usually coping is related to more problems).
Hendershot et al. (2011) United States	- To test a model predicting the indirect effect of an alcohol metabolising gene (ALDH2) through cognitive variables (including drinking motives) on drinking behaviour and alcohol related problems.	Cross-sectional survey design	171 Asian American young adults. Mean [SD] age was 20.32 [1.53] years.	DMQ-R (social, enhancement, and coping only)	Measures: - drinking motives - positive and negative alcohol expectancies - heavy drinking - 3 month alcohol-related problems - alcohol sensitivity - genotyping (to determine presence of ALDH2 gene)  Data Analysis: - structural equation modelling to test the theoretically derived model.	- Most frequently reported drinking motives were social followed by enhancement and coping motives. - The gene ALDH2 was negatively related to drinking problems, and this relationship was partially mediated by drinking motives and other cognitive variables. - No evidence for the mediation of the drinking motive-alcohol problems relationship by alcohol expectancies was found. I.e., motives appear to be more proximal determinants of drinking than expectancies.  - Relative contribution of each drinking motive in the mediation of ALDH2's effect on heavy drinking was not reported.
Hussong et al. (2005) United States	- To investigate the hypothesised moderating effect of drinking to cope on the relationship between negative mood states and use.	Initial assessment: - friendship dyad at university  Daily process study: 1 month daily process study with self-report data collected 3 times daily.  Follow up assessment: - friendship dyads returned to university for survey and observational measures	72 college students aged 18-20 years.	- 5 coping items from DMQ-R  - Coping measure (4-item substance abuse subscale of COPE; Carver et al., 1989)	Initial Assessment: - coping motivation  Daily Process study: - alcohol use - affect (fear, hostility, sadness, shyness) - attentiveness (as a measure of boredom)  Final visit - COPE (coping measure)  Analysis techniques: - Hierarchical regression	Unexpectedly: - for those with high coping motivation, daily mood was not strongly predictive of drinking behaviour. However: - those with high coping motivation showed less drinking on days with elevated sadness, boredom and hostility. - students with high coping motivation were found to drink more on days with elevated fear.  Explanation of findings: - students may be unable to accurately report coping motivation for drinking (issues with measure). - the time interval between negative mood event and drinking to cope may vary between person and drinking occasion.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Kuntsche and Cooper (2010) Switzerland	- To determine whether drinking motives predicted alcohol use on weekends with and without controlling for usual drinking habits and day of the weekend (Fri or Sat).	Baseline survey followed by daily process study (using SMS) over four weekends.	55 Swiss young adults with mean [SD] age of 22.7 [1.9] years.	DMQ-R (social, enhancement, coping, conformity)	Measures: At baseline: - drinking motives - usual alcohol use  Via SMS each Sat and Sun for one month: - total number of drinks consumed in the past 24hrs.  Data analysis: - multilevel modelling	- Motives were endorsed in the following rank order: enhancement, social, coping followed by conformity. - high enhancement motives (but not social, coping or conformity) were associated with increased weekend drinking after controlling for usual consumption. - young adults appear drink for fun and excitement predominantly on Friday and Saturday.
Kuntsche et al. (2007b) Switzerland	To test the mediating role of drinking motives (enhancement, coping and social) on the relationship between related alcohol expectancies (global positive-change, tension-reduction and social-behaviour) and alcohol use.	Cross sectional survey  Data collected as part of the European School Survey Project on Alcohol and Drugs, in 2003	5,616 Swiss school students with mean [SD] age of 15.1 [1.0] years.	DMQ-R (social, enhancement, and coping only)	Survey measures: - drinking motives - alcohol expectancies (global positive-change, social-behaviour, and 2 measures of tension reduction). - alcohol use (frequency, quantity, 5+ drinking)  Data analysis: - mediation analysis using multiple SEM models for each given expectancy and motive.	- Strong support generally that motives mediate the link between expectancies and alcohol use, as shown by reduced regression coefficients between expectancies and alcohol use when related motives were modelled. - Enhancement motives mediated the link between global positive change expectancies and alcohol use. - Social motives mediated the link between social-behaviour expectancies and alcohol use. - An exception was the tension reduction expectancy (when measured by the AEQ-A) that remained significantly related to alcohol use after controlling for coping motives. Therefore, some aspects of tension reduction appear to influence drinking behaviour directly.
Kuntsche et al. (2007a) Switzerland	- To investigate direct and indirect (via alcohol consumption) links between drinking motives and violent behaviours (bullying and violence)	Cross-sectional survey  Data collected in 2003 from European School Survey Project on Alcohol and Drugs; ESPAD	5419 school students with mean [SD] age of 15.0 [.86] years.	DMQ-R (social, enhancement, coping, conformity)	Survey Measures: - drinking motives - alcohol use - 5+ drinking (past month) - freq of bullying and violence (past 12 months)	- Enhancement motives were only indirectly linked to violence (through alcohol use). - Coping motives were both directly and indirectly linked to violence, suggesting that coping motives are linked to problem behaviours other than drinking. - Social motives were inconsistently related to drinking problems - Conformity motives were positively directly and negatively indirectly linked to bullying and fighting, suggesting that whilst they have a protective effect for alcohol related violence, they are a risk factor for non-alcohol related bullying and fighting.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Kuntsche, Knibbe, et al. (2010)  Switzerland	- To test the effectiveness of classifying risky drinkers as enhancement or coping motivated by their standardised (rather than raw) motive scores. - To explore characteristic differences between enhancement and coping motivated drinkers (as categorised by the coding system), in two randomly allocated samples.	Cross-sectional survey with sample divided randomly into two subsamples  Data collected in 2003 from ESPAD	2449 risky drinking school students with mean [SD] age of 15.2 [0.9] years.	DMQ-R (social, enhancement, coping, conformity)	Measures: - drinking motives - 5+ drinking - poor academic performance - frequency of going out in the evening - level of dissatisfaction with relationships - frequency of drinking at home - proportion of drinking peers  Coding System: - conversion of raw to standardised scores: (subtract the group mean motive score from an individual's motive score, and divide by the group standard deviation)  Data analysis: - Reliability was tested by applying coding system to two randomly selected subsamples, and then compared.  Convergent validity was tested by: - comparing allocation of students to a motive classification with those obtained by a number of k-means cluster analyses. - regression analyses explored differences between classified drinkers across outcomes of interest.	- The coding system produced two groups (enhancement and coping drinkers) that were similar to those derived from cluster analysis when using standardised scores. - Consistent with past research, compared to coping drinkers, enhancement drinkers were more likely to: - endorse enhancement and social motives for drinking - be older, and male - drink in the evenings - to have drinking peers and be less likely to: - drink at home, and for coping and conformity reasons.
Kuntsche et al. (2006a)  Switzerland	-Investigate associations between drinking motives and beverage preference - Investigate association between beverage preference and alcohol use - Investigate whether the beverage preference-alcohol use relationship is moderated or mediated by drinking motives.	Cross-sectional survey.  Data collected in 2003 from European School Survey Project on Alcohol and Drugs; ESPAD	5379 school students with mean [SD] age of 15.1 [0.95] years.	DMQ-R (social, enhancement, coping, conformity)	Survey Measures: - drinking motives - beverage preference (beer, wine, alcopops, spirits) - alcohol use - 5+ drinking  Data analysis: Hierarchical multiple regression to test mediation and moderation.	Motives-beverage type relationship: - enhancement motives were positively related to beer and spirit use and negatively to wine and alcopops. - social motives were positively related to alcopop use and negatively to wine use - conformity motives were positively related to wine and negatively to beer use  Beverage preference-alcohol use relationship: - beer and spirit use was positively related to high alcohol use (perhaps due to cost effectiveness of these drinks in creating intoxication). The beer-use link was mediated by drinking motives. - those who drank wine or alcopops were associated with lower alcohol use.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Kuntsche et al. (2006c)  Switzerland	<ul style="list-style-type: none"> <li>- Replicate four factor structure of DMQ-R on Swiss sample</li> <li>- To explore relation between drinking motives and outcome variables (consequences, alcohol use, and alcohol-related problems)</li> </ul>	<ul style="list-style-type: none"> <li>Cross-sectional survey.</li> <li>Data collected in 2003 from European School Survey Project on Alcohol and Drugs; ESPAD</li> </ul>	<ul style="list-style-type: none"> <li>5617 school students with a mean [SD] of 15.1 [0.94] years.</li> </ul>	<ul style="list-style-type: none"> <li>DMQ-R (social, enhancement, coping, conformity)</li> </ul>	<p>Survey Measures:</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- expected personal consequences of alcohol use (3 expectancy style items assessing impact on fun, outgoing and forget about problems)</li> <li>- typical alcohol use</li> <li>- 5+ drinking over last month</li> <li>- drinking problems (academic performance, violence and sexual intercourse)</li> </ul> <p>Analysis:</p> <ul style="list-style-type: none"> <li>- Confirmatory factor analysis</li> <li>- Structural equation modelling.</li> </ul>	<ul style="list-style-type: none"> <li>- Supported 4 factor solution to DMQ-R items.</li> <li>- Inter-correlations between factors were similar to those reported by Cooper (1994) with highest correlation between enhancement and social motives.</li> </ul> <p>Also consistent with Cooper (1994):</p> <p>Relation between motives and expectations.</p> <ul style="list-style-type: none"> <li>- enhancement and social motives related to expectation of fun</li> <li>- social motivation was related to social gains expectancies</li> <li>- only coping motivation was related to problem-alleviation expectancies</li> </ul> <p>Relation between motives and alcohol use:</p> <ul style="list-style-type: none"> <li>- enhancement motivation was related to all drinking measures</li> <li>- conformity motivation was negatively related to frequency and quantity of drinking</li> <li>- coping motivation was related to 5+ drinking</li> </ul> <p>Additional findings:</p> <ul style="list-style-type: none"> <li>- coping motivation was related to non-alcohol related problems calling into question the direction of causality between the two variables (cf Kuntsche, et al., 2007a)</li> </ul> <p>Moderations:</p> <ul style="list-style-type: none"> <li>- social drinkers who preferred alcopops drank less than those who did not prefer alcopops</li> <li>- coping drinkers who preferred spirits drank more than those who preferred other alcoholic drinks</li> </ul>
Kuntsche and Stewart (2009)  Switzerland	<ul style="list-style-type: none"> <li>- To explore the relationship between an individual's drinking motives and those of their peers.</li> <li>- What is the direct and indirect (through individual drinking motives) influence of classmate drinking motives on drinking behaviour?</li> </ul>	<ul style="list-style-type: none"> <li>Cross-sectional survey</li> <li>Data collected in 2003 from ESPAD</li> </ul>	<ul style="list-style-type: none"> <li>5647 Swiss school students comprising a variety of French, German and Italian-speakers.</li> <li>Mean [SD] age was 15.1 [0.95] years.</li> </ul>	<ul style="list-style-type: none"> <li>DMQ-R (social, enhancement, coping, conformity)</li> </ul>	<p>Measures (individual and classmates):</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- drinking volume</li> <li>- 5+ drinking</li> <li>- class attending</li> </ul> <p>Data analysis:</p> <ul style="list-style-type: none"> <li>- classmates average drinking motives and behaviours were calculated.</li> <li>- structural equation modelling to test mediating role of individual motives on relationship between classmate's motives on drinking behaviour measures.</li> </ul>	<ul style="list-style-type: none"> <li>- Authors use social learning theory and/or group selection processes to explain significant positive relationship between classmates' and individuals' drinking motives.</li> <li>- Unlike all of the other classmate motives that only related to the individual's motive of the same type, the conformity motive was significantly related to all individual motives. Authors suggest that an individual's conformity motives may be shaped by all motives of the classmate.</li> <li>- Individual drinking motives were found to completely mediate the small relationship (3-5% of variance explained) between classmate drinking motives and alcohol use.</li> </ul>

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Kuntsche et al. (2008)  Switzerland Canada United States	To investigate the stability of the DMQ-R across 3 national samples (Switzerland, Canada and the United States).	Cross-sectional surveys  Data collected in:  2003 (Switzerland) from ESPAD  2002 (Canada)  1989-1990 (United States)	School students:  Switzerland n = 5,118 Mean [SD] age was 15.3 [0.8] years.  Canada n = 2,557 Mean [SD] age was 15.7 [0.9] years  United States n = 607 Mean [SD] age was 15.7 [1.1] years	DMQ-R (social, enhancement, coping, conformity)	Survey measures: - drinking motives - drinking frequency - usual quantity - risky single occasion drinking: 5+ drinking (or 6+ for Canadian males) - alcohol related problems (related to friends, parents and school)  Data analysis: - confirmatory factor analysis - analysis of variance - structural equation modelling	- Four dimensional factor structure was a good fit to the data in all three national samples. - Rank order of motive endorsement was invariant across countries (social, enhancement, coping, followed by conformity). - Overall motive endorsement was highest in Canada, followed by Switzerland and the U.S. - Enhancement and coping motives were associated with increased alcohol use and risky drinking, and coping motives associated with problems associated with drinking. - Although there were some minor differences in the findings across nations, in general the results were remarkably similar. - supports use of DMQ-R when comparing international data.
Kuntsche, Wiers, et al. (2010)  Switzerland	- To test the extent to which Coopers (1994) four drinking motives mediate the relationship between alcohol expectancies and alcohol use.	Cross-sectional survey  Data obtained from the ESPAD (details above)	5,779 alcohol-using students. Mean age was 15.2 years.	DMQ-R (social, enhancement, coping, conformity)	Survey measures: - drinking motives - alcohol expectancies (items matched to DMQ-R except with introduction question "how likely is it that each of the following things would happen to you personally if you drink alcohol?" - drinking volume - 5+ drinking - alcohol related problems (academic, violence, injury, sex-related)  Analysis: - SEM to test predicted mediated model.	- Motives were endorsed in the following order of frequency: enhancement, social, coping and conformity. - Pattern of expectancy endorsement did not match pattern of motive endorsement, suggesting independence of constructs. - In general, expectancies predicted motives within like dimensions well; motives mediated the link between expectancies and drinking outcomes in 10 out of 12 outcomes tested. - In general, the coping motive acted as a stronger mediator than the positive motives (social and enhancement). The authors suggest that drinking to cope may be done with greater conscious awareness compared with other motives to drink. - In some instances, motives only acted as partial mediators - Conformity motives were linked with lower alcohol use, but with greater alcohol related problems. Authors suggest that whilst most drinking for conformity is infrequent and low quantity, this may not be the case for a subgroup of the population who drink to conform with heavy drinking peers (c.f., Kuntsche et al., 2007a)
LaBrie et al. (2007)  United States	- To examine links between reasons for drinking, alcohol consumption, and alcohol-related consequences.	Cross-sectional survey	Sample 1: 119 students who had violated campus alcohol policy Mean [SD] age was 18.55 [2.43] years.  Sample 2: 106 psychology student drinkers Mean [SD] age was 19.2 [2.4] years.	Reason for Drinking Scale (RFD: Cronin, 1997)(mood enhancement, social camaraderie, tension reduction)	Measures: - drinking motives - alcohol related problems (Rutgers Alcohol Problem Index) - alcohol consumption  Data analysis: - regression analysis to predict alcohol related problems from reasons for drinking, controlling for usual drinking.	- Most commonly reported reason for drinking was social camaraderie, followed by mood enhancement, and tension reduction. - Drinking for social camaraderie was associated with drinking problems for females in both samples, and with higher alcohol usage in males in sample 1. - Social drinking motives predicted consequences over and above alcohol use in females only.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
LaBrie et al. (2011)  United States	- To examine the relationship between sexual experience and drinking motives, alcohol expectancies, alcohol use and alcohol related non-sexual negative consequences.	Cross-sectional survey	550 first year college females. Mean [SD] age of 19.92 [.34] years.	DMQ-R (enhancement, social, conformity, coping)	Online survey measures: - drinking motives - positive alcohol expectancies - alcohol use (frequency, quantity, max drinks per occasion, binge episodes) - alcohol related non-sexual negative consequences - sexual status and behaviour  Data Analysis: - t-tests to assess mean differences between sexually experienced and inexperienced women across a variety of drinking variables. - hierarchical multiple regression to determine contributors to variance in alcohol-related nonsexual consequences.	Mean differences: - Sexually experienced women were higher on all subscales of drinking motives and alcohol expectancies. - Sexually experienced women also consumed more alcohol and were exposed to more nonsexual alcohol related harm (even after controlling for alcohol use) - Authors suggest that this may be due to associated risk taking personality styles such as impulsivity or sensation-seeking.  Predictors of alcohol related nonsexual consequences: - Coping, conformity and enhancement (but not social) motives predicted nonsexual alcohol-related consequences. - Coping motives were found to moderate the effect of sexual experience on alcohol-related nonsexual harm, such that as coping motivations increased, alcohol related consequences increased at a greater rate for sexually experienced compared with sexually inexperienced women. The authors suggest that this effect may reflect the summing of two risk factors (sexual experience and coping motivations).
Lee, Markman Geisner, Lewis, Neighbors, and Larimer (2007)  United States	- To determine whether perceptions of friends' approval of drinking moderate the link between the perceived prevalence of friends' drinking and personal alcohol use.  - To explore whether social drinking motives influence the above relationships.	Cross-sectional survey	1,400 undergraduate students aged between 17-19 years (mean and SD not reported)	DMQ-R (social only)	Survey measures: - social drinking motives - alcohol consumption (quantity and frequency) - perceived peer drinking (descriptive norms) - approval of high-risk alcohol use - perceived peer approval of high-risk drinking  Data analyses: - Hierarchical multiple regression techniques were used to assess relationship between groups of independent variables and alcohol consumption.	- Perceptions of friends' drinking behaviour positively associated with personal alcohol use, particularly for those who believe that their friends are approving of risky alcohol use. - Additionally, the above relationship was strongest for those who endorsed social drinking motives (i.e., social motives act as a moderator).
Leigh and Neighbors (2009)  United States	- To examine the relationship between mindfulness and alcohol consumption.  - To determine whether internal drinking motives (enhancement and coping) mediate the above relationship.  - To consider gender differences.	Cross sectional survey design	212 undergraduate students	DMQ-R (enhancement & coping only)	Survey measures: - drinking motives - mindfulness (openness, mind/body awareness, non-attachment to thoughts) - alcohol consumption  Data analysis: - Path analysis to test direct effects and mediation described by the proposed model.	General support for the proposed mediatory role of drinking motives in the link between mindfulness and alcohol use.  Aspects of mindfulness are differentially linked to alcohol use: - An increased awareness of mind and body was linked to increased alcohol use. - Non-attachment to thoughts was linked to decreased alcohol use in men only. - These relationships were mediated by enhancement (but not coping) drinking motives for men (but not women).  - Provides some support for positive (but not negative) affect regulation role of drinking for men, but not women.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Lewis et al. (2008) United States	- To examine the relationships between social anxiety, alcohol consumption, alcohol-related problems, and negative-reinforcement drinking motives (coping and conformity) among heavy drinking college students.	Cross-sectional survey design	316 heavy drinking college students (those who consumed 4, or 5 for males, drinks in one sitting in the previous month).  Mean [SD] age was 18.48 [1.81] years.	DMQ-R (coping and conformity only)	Measures: - drinking motives - social anxiety (overall anxiety score comprised of interaction anxiety, social fear, and social avoidance). - alcohol use (overall score comprised of weekly consumption, typical quantity consumed, and peak consumption) - alcohol related problems.  Data analyses: - Structural Equation Modelling	- Social drinking motives were most frequently reported, followed by enhancement, coping and conformity motives.  - Drinking motives were positively linked to alcohol consumption and alcohol-related problems, and alcohol consumption was related to alcohol-related problems. - Social anxiety was associated with decreased alcohol consumption, but increased alcohol-related problems, suggesting that those who are socially anxious drink less but do so more dangerously.  - The link between social anxiety and alcohol related problems was fully mediated by negative-reinforcement motives (coping and conformity) and alcohol consumption.  - No gender differences in these relationships were found.
Lewis et al. (2007) United States	- To explore the relationship between morally based self-esteem with drinking motives and alcohol consumption.	Cross-sectional survey design	201 college students with a mean [SD] age of 20.13 [3.52] years.	DMQ-R (social, enhancement, coping, conformity)	Survey measures: - drinking motives - morally based self-esteem (extent to which students base their self-esteem on principles and moral beliefs) - drinking behaviour (typical weekly consumption, peak number of drinks, average drinks per occasional)  Data analysis: - SEM to assess the adequacy of the hypothesised model predicting mediation role of drinking motives in the relationship between morally based self-esteem and drinking behaviour.	- Those who based their self-esteem on morals drank less. - Drinking motives were found to completely mediate the negative relationship between morally-based self-esteem and drinking behaviour. - Those who based their self-esteem on personal values and morals were less motivated by social and enhancement aspects of drinking than other students.  - Personal values may be an important component of intervention strategies for drinking in student populations.
Lyvers et al. (2010) Australia	- To examine the links between drinking motives, drinking restraint, drinking behaviour and problems associated with drinking.	Cross-sectional survey	University and community sample of young adults n = 221 Mean [SD] age was 22.01 [3.4].	DMQ-R (social, enhancement, coping, conformity)	Survey measures: - drinking motives - 'preoccupation' and 'control' over drinking (the Temptation and Restraint Inventory) - Alcohol related problems (AUDIT)  Data analysis: - Hierarchical multiple regression to test mediating role of 'control' and 'preoccupation' in the link between motives and alcohol related problems.	- Coping, enhancement and social motives, as well as preoccupation with drinking, were positively related to alcohol use, and alcohol related problems (without controlling for use). - The positive link between coping and drinking behaviour was mediated by preoccupation with drinking.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Martens, Neighbors, et al. (2008) United States	- To determine whether coping drinking motives, and negative affect moderate the relationship between alcohol use and alcohol related problems.  Hypothesis: - Those high in negative affect and coping motives would experience the strongest relationship between alcohol use and alcohol related consequences.	Cross-sectional survey	316 alcohol using college students. Mean [SD] age was 18.48 [1.18] years.	DMQ-R (coping only)	Survey measures: - coping drinking motives - alcohol use - alcohol related problems - negative affect  Data analysis: - Regression analysis to determine interactions between drinking to cope, negative affect and alcohol use on alcohol related consequences.	Consistent with prediction: - For those who rarely drink to cope the relationship between alcohol use and alcohol related problems did not vary depending on the level of negative affect experienced. - However, for those who commonly reported drinking to cope, the relationship between alcohol use and alcohol related problems was greater for those also experiencing negative affect.  - That is, negative affect has an influential role in predicting harm associated with alcohol use, and this is especially true for those who drink to cope.
Martens, Rocha, et al. (2008) United States	- To assess the reliability and validity of the four factor structure of the DMQ-R in an ethnically diverse student sample.  - To examine differences in ethnicity and class standing (freshman, sophomore, junior, senior, graduate student) on drinking motives.	Cross-sectional survey	441 college students. The mean [SD] age was 19.82 [2.38] years	DMQ-R (social, enhancement, coping, conformity)	Survey measures: - drinking motives - alcohol use - alcohol-related problems (RAPI)  Data analysis: - Confirmatory factor analysis to assess factor structure of the DMQ-R - Correlation to test for expected relationships between variables.	- The four factor model provided adequate fit to the data. - Motives were reported in the expected order of frequency (social, enhancement, coping, conformity) - Positive reinforcement (social and enhancement) drinking motives were moderately correlated with alcohol use and drinking problems. - Negative reinforcement (coping and conformity) drinking motives were only weakly related to alcohol use, and moderately related to drinking problems. - Unexpectedly, there was no indication that negative drinking motives were more problematic than positive motives.  - Freshmen and non-white students had higher conformity motives compared to senior s and white students respectively. - The positive relationship between conformity motives and alcohol use was smaller for freshman than other students.
Mazzardis et al. (2010) Italy	- To validate the 4 factor structure of the DMQ-R SF in an Italian adolescent sample and to investigate links between motives and alcohol use and sensation seeking.	Cross sectional survey	2725 alcohol-using students.  Mean [SD] age of 16.2 [1.8] years.	DMQ-R SF (social, enhancement, coping, conformity)	Survey measures: - drinking motives - sensation seeking (the 'desire for intense and novel experiences' p906) - alcohol use (frequency of beer, wine spirit and alcopop and spritz beverages)	- General support was found for the four factor solution, showing good fit to the data that did not vary significantly across age and gender. - Internal consistency was acceptable with the exception of one enhancement item "to have fun". - Enhancement and social motives were highly correlated ( $r = 0.8$ ). - Enhancement, followed by social and then coping motives were most positively associated with sensation seeking and frequency of alcohol use. - The conformity motive was negatively related to sensation seeking and frequency of alcohol use.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Merrill and Read (2010)  United States	<p>- To examine the direct and indirect (through increased alcohol use) relationships between internal drinking motives (enhancement and coping) and drinking consequences.</p> <p>- Hypothesised that coping motives would act directly and indirectly on drinking consequences, but that enhancement motives would only act on these consequences indirectly via alcohol use (based on past empirical findings).</p>	Cross sectional survey	192 young adult psychology undergraduates. Mean [SD] age of 19.1[1.2] years.	DMQ-R (social, enhancement, coping, conformity)	<p>Survey measures:</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- alcohol use via Timeline Follow Back method (TLFB; Sobell &amp; Sobell, 1992) (quantity, frequency, heavy episodic drinking and estimate of daily blood alcohol concentration)</li> <li>- alcohol related consequences (social/interpersonal, academic/occupational, risky behaviour, impaired control, poor self-care, diminished self-perception, blackout drinking, and physiological dependence) via YAACQ (Read et al., 2006)</li> </ul> <p>Data analysis:</p> <ul style="list-style-type: none"> <li>- Structural Equation Modelling to test adequacy of hypothesised model.</li> </ul>	<ul style="list-style-type: none"> <li>- Social motives were reported most commonly, followed by enhancement, coping and conformity.</li> <li>- The hypothesised model did not fit the data well, however the respecified model provided an excellent fit.</li> <li>- Respecified model explained 19% of alcohol use, and between 6-16% of the 8 consequences measured.</li> </ul> <p>Indirect links (via alcohol use)</p> <ul style="list-style-type: none"> <li>- Enhancement and coping (but not social and conformity) motives were positively linked with multiple alcohol related problems via increased alcohol use.</li> </ul> <p>Direct links:</p> <ul style="list-style-type: none"> <li>- Coping motives were positively linked with academic/occupational problems, risky behaviour and poor self care, but not physiological dependence as expected.</li> <li>- Enhancement motives were positively linked with blackouts.</li> <li>- Unexpectedly, conformity motives were positively linked with a number of consequences. (cf Kuntsche et al., 2007 re direct link to violence).</li> </ul> <ul style="list-style-type: none"> <li>- Students who drink to cope are likely to be struggling across multiple domains irrespective of how much they drink.</li> <li>- Similarly, students who drink to conform are likely to have issues unrelated to alcohol-use.</li> <li>- Students who drink to enhance positive affect are more likely to experience negative consequences as a result of increase alcohol use.</li> <li>- Students who drink for social reasons show no clear increase in alcohol-related or non-alcohol-related issues.</li> </ul>

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Mezquita et al. (2010)  Spain	- To explore the links between personality domains, internal drinking motives (enhancement, coping-anxiety, and coping-depression), alcohol use, and alcohol related problems.  Predictions: - coping-depression motives would be related to neuroticism - coping-anxiety motives would be related to neuroticism and low extraversion. - enhancement motives would be related to extraversion and low conscientiousness. - enhancement motives would be related to heavy drinking - coping-depression and coping-anxiety motives would be related to alcohol related problems.	Cross-sectional survey design	521 undergraduate student drinkers.  Mean [SD] age of 19.95 [1.3] years.	Modified DMQ-R (enhancement, coping-anxiety, coping-depression only)	Survey measures: - drinking motives - personality domains (neuroticism, extraversion, and conscientiousness) via the Spanish version of the NEO-FFI (Sanz, Silva, & Avia, 1999). - alcohol related problems (RAPI; White & Labouvie, 1989) - alcohol use (quantity and frequency)  Data analyses: - Structural Equation Modelling to explore adequacy of hypothesised relationships.	- Enhancement motives were most frequently reported, whilst coping-depression and coping-anxiety were reported similarly, and less often. - Initial model fit was adequate-good but with respecifications (removing the link between low extraversion and coping-anxiety, and adding direct links between a number of personality and alcohol related consequence variables) the fit improved substantially.  - Although different to those hypothesised, unique personality domains predicted coping-anxiety (namely, neuroticism and low conscientiousness) and coping-depression (neuroticism alone). - As expected, enhancement was predicted by extraversion and low conscientiousness. - These results support the separation of coping motives into those that are anxiety related with those that are depression related, given the unique links with personality dimensions .  - Neuroticism and low conscientiousness were linked directly and indirectly (via coping motives) with alcohol-related problems, whereas extraversion was only indirectly linked to alcohol-related problems (via enhancement motives and alcohol use), suggesting that neuroticism and low conscientiousness may represent risky personality traits with regard to the development of drinking problems.
Mohr et al. (2005)  United States	- To understand the relationships between the drinking context, the desirability of daily social interactions (classified as either positive or negative) and the mood of each participant on their consumption of alcohol.  - To determine whether an individual's endorsement of drinking motives moderates the above relationships.	Cross sectional survey followed by 3 week online daily interview.	122 undergraduate psychology students  Mean [SD] age of 18.9 [1.2] years.	DMQ-R (social, enhancement, coping, conformity)	Initial Survey assessed: - drinking motives  Daily Interview assessed: - alcohol consumption - time spent with friends that day - daily mood - daily social contacts (categorised into positive and negative)  Analysis: - Hierarchical multiple regression	Drinking to cope and conform: - Negative social contacts predicted subsequent drinking at home, but only for those with high (and not low) coping motives. - Positive social contacts predicted subsequent drinking for those with low (and not high) coping motives. - Unexpectedly, drinking to conform was associated with more drinking on days of negative mood, but not to negative daily contacts.  Drinking for enhancement and social motives: - As expected people drank more on days of positive mood, and positive social contacts. - However, a moderation effect was found for enhancement motives such that those with stronger motives were less likely to drink on days with more positive social interactions. - Unexpectedly, highly socially motivated drinkers did not drink more on days of positive social interactions, or increased time spent with friends. However, these relationships were present for those with low social motives. The authors suggest that social motives may operate concurrently with drinking rather than predicatively.  - Highlights importance of studying within-person factors on drinking, as alcohol use is context specific.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
S. Müller and Kuntsche (2011)  Switzerland	- To investigate whether adolescent drinking motives mediate the link between their parent's drinking habits and their own alcohol use.	Cross-sectional survey design  Data were collected as a part of the Health Behaviour in School-Aged Children survey.	1,854 alcohol drinking 13-15 yr olds.  Mean [SD] age of 14.4 [0.6] years.	DMQ-R SF (social, enhancement, coping, conformity)	Survey measures: - drinking motives - parental drinking (frequency and quantity for each parent) - frequency of adolescents' alcohol consumption. - frequency of adolescents' drunkenness  Analysis: - Structural Equation Modelling to test mediation model.	- Social motives were reported most frequently, followed by enhancement, coping and conformity motives.  - Parental drinking predicted adolescent alcohol consumption and drunkenness, and this weakened (though remaining significant in the case of alcohol consumption) when motives were included in the models. - Social, enhancement and coping motives partially mediated the link between parental drinking and adolescent alcohol use. - Enhancement and coping motives fully mediated the link between parental drinking and adolescent drunkenness. - Parents' alcohol use may influence their child's drinking by shaping their drinking motives.  - Both models (alcohol use, and drunkenness) fit the data well, and explained a substantial amount of variance in the respective outcome measures (31.8% and 33.4%)
C. J. Mushquash, Stewart, Comeau, and McGrath (2008)  Canada	- To test the factor structure of the DMQ-R in a sample of native Canadians	Study 1: Cross-sectional survey  Study 2: Qualitative interviews.	Study 1: 164 native Canadian school students Mean [SD] age of 16.3 [1.3] years.  Study 2: High alcohol risk students (number not reported).	DMQ-R (social, enhancement, coping, conformity)	Study 1: Exploratory Factor Analysis  Study 2 Thematic analysis of interview transcripts.	- 3 factor structure best fitted the data from this population. (enhancement, coping and conformity). - Social motive was not identified by participants as a distinct motive in follow up interviews.
Neighbors et al. (2004)  United States	- To test whether one's desire for social approval mediates the relationship between perceived lack of control and drinking motives.	Cross-sectional survey design	204 college students with a mean [SD] age of 19.0 [1.82] years.	DMQ-R (social, enhancement, coping, conformity)	Survey measures: - drinking motives - controlled orientation (perceived lack of free choice) - contingent self-esteem (desire for social approval) - alcohol consumption - alcohol related problems (RAPI)	- Usual order of motive endorsement (social, enhancement, coping, conformity)  - The desire for social approval mediates the influence of perceived lack of control on all drinking motives except conformity.  - These findings indicate that drinking motives may serve the function of regulating self-esteem (via affect regulation or gaining social approval).
Németh, Kuntsche, et al. (2011)  Hungary	- To evaluate the 4 factor structure of the DMQ-R SF in a young adult Hungarian sample.	Cross sectional survey	390 Young Hungarian adults attending a music festival.  Mean [SD] age of 23.6 [4.4] years.	DMQ-R SF (social, enhancement, coping, conformity)	Music festival goers were surveyed to assess: - drinking motives - alcohol use (over past 30days) - problems associated with drinking (academic problems, risky sexual intercourse, violent behaviour in last year)  Analyses: Confirmatory Factor Analysis	- Factor loadings, model fit and internal consistency support measurement properties for the DMQ-R SF. - Social drinking motives were most frequently endorsed, followed by coping, conformity and enhancement. - Men more frequently endorsed social, coping and conformity motives. - Only social motives were significantly positively related to alcohol use measures. - Coping motives were positively related to all measures of alcohol problems. - Conformity was positively related to violent behaviour.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Németh, Urbán, et al. (2011)  Spain & Hungary	- To compare the drinking motives endorsed by Spanish and Hungarian young adults.	Cross-sectional survey design	550 Spanish college students. Mean [SD] age 22.7 [3.2] years.  977 Hungarian college students Mean [SD] age of 22.4 [2.7] years.	DMQ-R SF (social, enhancement, coping, conformity)	Survey measures: - drinking motives - alcohol use (past 30 day freq and quant) - alcohol-related problems (RAPI)  Data analysis: - Separate confirmatory factor analyses to test the 4 factor structure in each sample. - SEM techniques to measure differences between sample groups.	Factor structure: - Acceptable four-factor solution both samples. - Motives were endorsed in the following order of frequency: social, enhancement, coping and conformity. (both samples), and explained about 30% to 40% of the variance in alcohol related problems.  Alcohol use and problems: - Social, enhancement, and coping motives showed strong bivariate correlations with alcohol use, drunkenness and alcohol-related problems ( $\beta$ of .6 to .8) in both samples. - When controlling for other motives: coping motives were related to alcohol-related problems (both samples) social motives were not linked to use or consequences (both samples) enhancement motives were related to alcohol-related problems (Spanish sample only)
Norberg et al. (2010)  Australia	- Examined the relationship between social anxiety and alcohol variables (alcohol use, drinking motives, type of drinking situation) in female and male college students.	Cross sectional survey	118 university students who had experienced at least occasional social anxiety. Mean [SD] age was 19.5 [3.2] years	DMQ-R (social, enhancement, coping, conformity)	Measures: - drinking motives - alcohol use and alcohol related consequences - social anxiety - type of drinking situation (negative, positive, or temptation situations)  Data Analysis: - mediated moderation analysis to determine moderating effect of gender, and mediating effect of social anxiety and drinking motives on alcohol related use and consequences.	- Females more likely to drink for coping and in negative situations, than men. - Social anxiety serves as a risk factor for alcohol related consequences in females, but a protective factor in males. - For females (but not males) coping and conformity motives partially mediated the social anxiety-alcohol related consequences link. - For males (but not females) enhancement motives and drinking in positive situations partly mediated the social anxiety-alcohol consumption link.  - For those who are socially anxious, alcohol related harm appears to more commonly occur via a negative motivational pathway for women, and a positive motivational pathway for men.
Norberg et al. (2011)  Australia	- To determine whether gender, social anxiety, and drinking motives relate differently to various categories of alcohol-related consequences.	Cross-sectional survey design	118 college students	DMQ-R (social, enhance, coping, conformity)	Survey measures: - drinking motives - social anxiety - 90 day alcohol consumption and consequences  Data analysis: - Poisson regression adjusting for alcohol consumption to determine relationships of interest.	- Alcohol-related consequences were categorised into four groups (social consequences, physical consequences, personal consequences, role consequences).  Social anxiety: - High social anxiety was related to more personal and role functioning adverse consequences for women only. - Compared to women, men endorsed more physical consequences overall, and more social and personal consequences for those with low to moderate social anxiety.  Drinking motives: - Enhancement motives were associated with physical consequences largely due to higher alcohol consumption. - Coping motives predicted adverse social consequences. - Drinking motives were not related to role functioning consequences in the final model.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
O'Connor and Colder (2005)  United States	- To identify qualitatively distinct patterns of drinking based on quantity and frequency of consumption, and alcohol-related problems. - To explore the relationship between personality (sensitivity to reward SR; sensitivity to punishment SR) with patterns of drinking. - To test hypothesis that enhancement and coping motives mediate the relationships SR and SP have with patterns of drinking respectively.	Cross-sectional survey	University freshmen students. N = 533. (women: Mage = 18.03 years, SD = 0.44; men: Mage = 18.2, SD = 0.54)	DMQ-R (social, enhancement, coping, conformity)	Paper and pencil survey delivered in a group setting  Survey measures: - Alcohol use (quantity and frequency in previous month) - Alcohol related problems (Young Adult Alcohol Problems Screening Test; YAAPST, Hurlbut and Sher (1992)) - Sensitivity to Punishment / Sensitivity to Reward Questionnaire – SPSRQ  Analyses: - Latent Profile Analysis - Logistic regression	- Five classes of drinking profiles were identified: Two common or 'typical' classes: 1. light drinkers or abstainers with few problems; 2. heavy occasional drinking without impairment.  Three less common classes of drinking which were characterised by more problematic use: 3. heavy occasional drinking with impairment 4. very heavy occasional drinkers with impairment 5. heavy frequent drinkers with impairment  - SR was related to most but not all problematic drinking patterns (suggesting that SR only explains some patterns of drinking), but not typical/unproblematic drinking. - SP did not predict drinking patterns  Mediation: - Partial mediation of the link between SR and alcohol use by drinking motives; those sensitive to reward were more likely to drink for enhancement which was associated with class 3 drinking. - Unexpectedly, coping and social motives also mediated relationship between SR and alcohol use.
Ostafin, Bauer, and Myxter (2012)  United States.	- To examine via a clinical trial of mindfulness training whether mindfulness moderates the expected link between automatic alcohol motivation and heavy drinking.	Randomised Control Trial	41 alcohol using undergraduate students with a mean [SD] age of 19.2 [1.1] years.	IAT testing automatic alcohol motivation (Ostafin & Marlatt, 2008)	Baseline measures: - automatic alcohol motivation (IAT procedure) - heavy drinking behaviour - mindfulness  After completing a baseline survey participants were randomly assigned to a: - control group, or - mindfulness training group both involved 3 sessions of audio training.  Follow-up measures: - heavy drinking behaviour - mindfulness was measured after each training session.	- Those who received mindfulness training showed a weaker (positive) association between automatic alcohol motivation and heavy drinking compared to those who did not.  - Supports the hypothesis that mindfulness attenuates the link between automatic alcohol motivation and heavy drinking.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
C. L. Park et al. (2004) United States	<ul style="list-style-type: none"> <li>- To examine the within-person relationship between daily stress and alcohol consumption</li> <li>- To examine whether daily coping strategies and affective states mediate the above relationship.</li> <li>- To examine whether between-person factors (sex, family history, drinking motives, sensation seeking, neuroticism) moderate the daily stress-drinking relationships found.</li> </ul>	Daily process study via internet.	137 college students with a mean [SD] age of 18.72 [1.02] years.	DMQ-R (social-enhancement, coping)	<p>Baseline survey measures:</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- family history of alcohol use</li> <li>- neuroticism</li> <li>- sensation seeking</li> </ul> <p>Daily diary measures:</p> <ul style="list-style-type: none"> <li>- daily stress</li> <li>- daily coping style (emotion approach coping, avoidance coping, and problem-focused coping)</li> <li>- daily affect</li> <li>- daily alcohol use</li> </ul> <p>Data analysis:</p> <ul style="list-style-type: none"> <li>- correlation to assess relationships between measured variables</li> <li>- multilevel regression analyses to determine the stress-drinking association and the mediating role of coping style and affect, and the moderating effect of drinking motives.</li> </ul>	<p>At the between subjects level:</p> <ul style="list-style-type: none"> <li>- those who experienced greater stress on average drank less.</li> </ul> <p>At the within-person (daily) level:</p> <ul style="list-style-type: none"> <li>- Alcohol use increased in relation to daily stress, but only when controlling for variation associated with the day-of-the week and daily coping style.</li> <li>- this relationship remained significant when controlling for daily affect.</li> <li>- problem-focused problem solving coping styles were associated with decreased alcohol use.</li> </ul> <p>Motives:</p> <ul style="list-style-type: none"> <li>- social-enhancement motivation interacted with level of emotion approach coping (actively processing and expressing emotions) in determining alcohol consumption. Those high (compared to low) in social-enhancement motivation drank more following days high in emotion approach coping.</li> <li>- coping motivation also interacted with level of emotion approach coping such that those high (compared to low) in coping motivation drank less following days high in emotion approach coping</li> </ul>
Patrick, Lee, et al. (2011) United States	<ul style="list-style-type: none"> <li>- Are drinking motives associated with the use of protective behavioural strategies for drinking?</li> <li>- Do drinking motives moderate the relationship between protective strategies and drinking consequences?</li> </ul>	Cross-sectional survey	<p>358 college students who had reported at least one heavy episode of drinking within the previous month.</p> <p>Mean [SD] age was 18.47 [.58] years.</p>	DMQ (social, enhancement, coping)	<p>Survey measures:</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- protective strategies (e.g., use of a designated non-drinking driver)</li> <li>- alcohol related problems (RAPI)</li> <li>- drinks per week</li> </ul> <p>Data analysis:</p> <ul style="list-style-type: none"> <li>- Hierarchical multiple regression to determine relationships between variables of interest.</li> </ul>	<ul style="list-style-type: none"> <li>- Using protective strategies more frequently was related to consuming less alcohol, and fewer drinking problems.</li> </ul> <p>Relationships between drinking motives and use of behavioural protective strategies:</p> <ul style="list-style-type: none"> <li>- Enhancement and socially motivated drinkers used protective strategies less frequently.</li> <li>- Controlling for alcohol use, conformity motivated drinkers used protective strategies more frequently.</li> </ul> <p>Moderation:</p> <ul style="list-style-type: none"> <li>- generally non-significant, except that greater coping and conformity motives were especially related to more alcohol problems among individuals with fewer protective strategies.</li> </ul>
Piko (2006) Hungary	<ul style="list-style-type: none"> <li>- To explore the influence of social motives, parental attitudes, communal mastery and peers' substance use patterns on adolescent smoking and drinking.</li> </ul> <p>(only results relating to drinking are summarised here)</p>	Cross-sectional survey design	634 high school students aged 11-19 years. Mean [SD] age of 15.6 [2.0] years.	Substance Use Coping Inventory (Wills, Sandy, Shinar, & Yaeger, 1999) (social only)	<p>Survey Measures:</p> <ul style="list-style-type: none"> <li>- social drinking motives</li> <li>- social influences (perceived peer substance use, perceived best friend substance use)</li> <li>- communal mastery (defined as; confidence of goal attainment via social connectedness).</li> </ul> <p>Analyses:</p> <ul style="list-style-type: none"> <li>- multiple regression addressed the main research aim.</li> </ul>	<ul style="list-style-type: none"> <li>- Boys reported higher social drinking motives compared to girls.</li> <li>- For both genders, the best predictor of alcohol use was best friends' consumption, followed by social drinking motives.</li> </ul>

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Rafnsson et al. (2006) Iceland	- To replicate in an Icelandic population, the US study conducted by Windle and Windle (1996) investigating the effect of stressful events, trait-like coping strategies, and coping drinking motives on students emotional and behavioural problems.	Cross-sectional survey	1251 Icelandic adolescents aged 17-21 years (Mage = 18.91 years, SD = 1.25)	DMQ (social and coping only)	Survey measures: - drinking motives - coping strategies (task coping, emotion coping, and avoidance coping). - major stressful life events - recent negative and positive daily events - depressed effect - alcohol use (average daily consumption) - alcohol related problems (13 items covering problems with friends, family, school, the police, passing out and regrets) - grade point average  Analyses: - Correlation and multiple regression.	- Coping motive endorsement predicted alcohol use, alcohol related problems, and depressed affect (but not academic performance). - Task orientated coping was associated with fewer problems than emotion orientated coping, suggesting that those who are emotion-orientated may require intervention focus. - Coping motive endorsement was associated with the use of emotion-orientated coping strategies. - Life stressors, and negative daily events predicted a wide range of problems within this sample. - Findings from this Icelandic sample demonstrated a very similar pattern to those reported in the US by Windle and Windle (1996).
Schelleman-Offermans et al. (2011) Netherlands	- To explore the relationship between drinking motives and alcohol use longitudinally. - To explore the above relationship with and without controlling for previous alcohol use. - To examine whether prior alcohol use predicts future drinking motives (i.e., to test for reverse causality)	Prospective longitudinal survey, with 2 waves of data collection 1 yr apart.	454 alcohol using and alcohol use motivated adolescents with mean [SD] age of 14.8 [0.78] years at wave 1.	DMQ-R (social, enhancement, coping and conformity)	Survey measures: - drinking motives - total weekly consumption (TWC) - frequency of heavy episodic drinking (HED)  Analyses: - Full cross lagged SEM	- At both data collection points motives were endorsed with the following order of frequency: social, enhancement, coping and conformity (high to low).  At T1 only: - social, enhancement and coping motives were positively related to both drinking outcomes (with betas ranging from 0.12 to 0.27). Conformity had a weak negative association (beta = - 0.10) with total consumption only.  Comparing T1 with T2: - T1 social, and to a lesser extent enhancement, motives predicted greater alcohol use at T2 (with betas ranging from 0.11 to 0.22). No significant effect was found for coping, whilst conformity predicted a small reduction in future heavy episodic drinking (beta = -0.12) - All motives at T1 strongly predicted motives at T2 (betas ranging from 0.32 to 0.44). - past drinking behaviour was the best predictor of future drinking behaviour (TWC beta = 0.33; HED beta = 0.41)  - Past drinking behaviour did not predict future motives. No evidence of reverse-causality.  - Whilst relatively stable, motives do change over time. - shift from social to enhancement and coping motives throughout early adolescence.  - Demonstrated the importance of social motives in predicting heavy alcohol use (at least in a culture that endorses heavy drinking).

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Siviroj et al. (2012) Thailand	- To explore the link between sensation seeking, drinking motives and alcohol use in Thai school students.	Cross-sectional survey	634 Thai high school students with mean [SD] age of 15.1 [1.8] years.	DMQ-R (social, enhancement, coping, conformity)	<p>Survey measures:</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- alcohol use</li> <li>- sensation seeking (thrill and adventure seeking, experience seeking, disinhibition, boredom susceptibility)</li> <li>- beverage preference</li> </ul> <p>Data analysis:</p> <ul style="list-style-type: none"> <li>- regression analysis to determine influence of drinking motives and sensation seeking on alcohol use.</li> </ul>	<ul style="list-style-type: none"> <li>- Social motives were endorsed most commonly followed by enhancement, coping, and conformity motives.</li> <li>- Social and coping motives positively predicted drinking frequency.</li> <li>- Coping motives positively predicted binge drinking</li> <li>- Sensation seeking positively predicted alcohol use and binge drinking.</li> </ul>
S. H. Stewart et al. (2006) Canada	- To explore the relationships between social anxiety, drinking motives and drinking behaviour.	Cross-sectional survey	157 alcohol using university students with a mean [SD] age of 21.4 [3.5] years.	DMQ-R (social, enhancement, coping, conformity)	<p>Survey measures:</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- social phobia (social avoidance and distress, fear of negative evaluation)</li> <li>- alcohol use</li> <li>- alcohol related problems (RAPI)</li> </ul> <p>Data analysis:</p> <ul style="list-style-type: none"> <li>- Correlation determine the strength and direction of associations between variables and possible mediation.</li> </ul>	<ul style="list-style-type: none"> <li>- The direction of the relationship between social anxiety and drinking outcomes depends on the aspect of social anxiety and the alcohol related variable in question.</li> <li>- Coping and conformity drinking motives are positively related to social avoidance and fear of negative evaluation dimensions of social anxiety. Unexpectedly, social motives were also (weakly) associated with social anxiety dimensions.</li> <li>- The positive relationship between fear of negative evaluation and alcohol problems was mediated by negative reinforcement motives (coping and conformity)</li> </ul>
S. H. Stewart et al. (2011) Canada	<p>- To explore the relationships between hopelessness, depressive symptoms, drinking to cope, and excessive drinking.</p> <p>- Hypothesised a model whereby hopelessness leads to depressive symptoms, which in turn lead to coping motives, which in turn lead to excessive drinking.</p>	Cross-sectional survey	551 alcohol drinking aboriginal Canadian adolescents. Mean [SD] age 15.9 [1.3] years.	DMQ-R (coping only)	<p>Survey measures:</p> <ul style="list-style-type: none"> <li>- drinking to cope motive</li> <li>- hopelessness (from the substance use risk profile scale)</li> <li>- depressive symptoms (from the Brief Symptom Inventory)</li> <li>- excessive drinking (quantity, frequency, frequency of binge (5+) drinking)</li> </ul> <p>Analyses:</p> <ul style="list-style-type: none"> <li>- Structural Equation Modelling to assess the adequacy of the hypothesised model to fit the data.</li> </ul>	<ul style="list-style-type: none"> <li>- The hypothesised model showed a good fit to the data (with one respecification – a direct link between hopelessness and drinking to cope)</li> <li>- As hypothesised, the path from hopelessness to excessive drinking was mediated by depressive symptoms and drinking to cope.</li> <li>- That is, direct links were observed between hopelessness and depressive symptoms, between depressive symptoms and drinking to cope, and between drinking to cope and excessive drinking.</li> <li>- Depressive symptoms, and drinking to cope should be targets for interventions for Canadian Aboriginal youth who are high in hopelessness.</li> </ul>

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Topper et al. (2011) United Kingdom	- To investigate the relationships between school victimisation, drinking motives, alcohol use and alcohol-related problems.  - Hypothesised that drinking to cope would mediate the relationship between victimisation and alcohol use, and alcohol related problems.	12 month longitudinal survey with 2 collection time points.	324 students aged 13-15 years. Mean [SD] age was 13.92 [0.74] years.	DMQ-R (social, enhancement, coping, and conformity)	Measures at baseline and 12 month follow-up: - drinking motives - bullying victimisation - alcohol-related problems in past 6 months - alcohol use (quantity x frequency)  Analyses: - correlations - path analysis - bootstrapping mediational analyses	- Baseline exposure to victimisation predicted 12 month coping motivation and alcohol related problems. - Drinking to cope at 12 months partially mediated the relationship between baseline victimisation and future drinking problems (but not alcohol consumption). - victimisation may result in a particularly risky form of drinking behaviour (at least partially mediated by coping motivation).
Urbán et al. (2008) Hungary	- To test a model explaining alcohol use via the influence of antecedent variables (sensation seeking, age and gender) and mediators (expectancies and drinking motives).	Cross-sectional survey	707 Hungarian high school students with mean [SD] age of 16.5 [1.5] years.	DMQ-R (social, enhancement, coping, conformity)  - further reduced to one summary score of drinking motives	Survey measures: - drinking motivation - alcohol use (including +5 drinking) - alcohol outcome expectancies - sensation seeking  Data analysis: - Exploratory factor analysis of drinking motives to further reduce data down to one summary score. - Structural equation modelling to test hypothesised relationships.	The following paths between sensation seeking and alcohol use were found (with % of the relationship explained by the path in brackets) : - sensation seeking → positive expectancy → drinking motives → alcohol use (explaining 35% of the sensation seeking-alcohol use relationship) - sensation seeking → negative expectancy → alcohol use (3%)  - Evidence that drinking motivation is the final mediator in the pathway from sensation seeking to alcohol use, via positive alcohol expectancies. - However, sensation seeking appears not influence alcohol use via negative alcohol expectancies as expected. Consequently the further mediating role of drinking motives in this relationship was not explored.
Van Tyne et al. (2012) United States	-To examine the direct and indirect (through drinking motives) effect of alcohol expectancies on risky drinking behaviour (participation in drinking games) and alcohol related harm.	Cross-sectional survey	254 alcohol using high school students aged 14-18 years.	DMQ-R (dropped conformity motive due to non-normal distribution, leaving social, enhancement and coping)	Survey measures: - drinking motives - alcohol-related harm (AUDIT) - frequency of drinking games participation - positive and negative alcohol expectancies - positive and negative expectancy valuations (perceived importance of each expectancy outcome)  Analyses: - Path analysis	In the final model: - Positive alcohol expectancies were directly linked to alcohol problems, but not drinking game participation (after controlling for demographics and drinking motives). - Negative alcohol expectancies were not directly linked with alcohol problems or drinking game participation. - Enhancement (but not coping or social) motives displayed a positive link with alcohol problems.  Mediation: - Social motivation mediated the link between positive expectancies (and expectancy valuations) and participation in drinking games. Those who expect and value positive drinking outcomes, tend to have stronger social drinking motives, and participate in more drinking games. This highlights the social nature of participation in drinking games. - Social and enhancement motives mediated the link between positive expectancies (and expectancy valuations) and alcohol related harm, such that those who expect and value positive drinking outcomes tend to be exposed to greater alcohol-related harm via a stronger motivation to drink for social and enhancement reasons.

Authors and country of study	Main aim/research questions	Design	Sample	Measure of motives	Methodology	Summary of key evidence/findings
Willem et al. (2012) Belgium	- To explore the associations between temperament dimensions, drinking motives, alcohol consumption and alcohol-related consequences.	Cross-sectional survey	188 alcohol drinking adolescents aged between 13-20 years. Mean [SD] age of 16.9 [1.32] years.	Modified DMQ-R (social, enhancement, coping-anxiety, coping-depression, conformity)	<p>Survey measures:</p> <ul style="list-style-type: none"> <li>- drinking motivations</li> <li>- temperament variables; motivational reactivity (behavioural inhibition, behavioural activation-fun seeking), and affective reactivity (positive reactivity, negative reactivity)</li> <li>- alcohol consumption and alcohol related problems (AUDIT)</li> </ul> <p>Data analyses:</p> <ul style="list-style-type: none"> <li>- hierarchical linear regression to test the association between temperament and motive variables with alcohol use and alcohol related problems.</li> <li>- bootstrapping techniques were used to test mediation.</li> </ul>	<ul style="list-style-type: none"> <li>- Enhancement motives were endorsed most frequently, followed by social, coping-anxiety, conformity and coping-depression motives.</li> <li>- High behavioural activation-fun seeking, high social and enhancement motives and low conformity motives were associated with alcohol consumption.</li> </ul> <p>Mediation:</p> <ul style="list-style-type: none"> <li>- enhancement and social motives were found to mediate the relationship between behavioural activation-fun seeking and alcohol consumption.</li> </ul> <p>After controlling for alcohol consumption:</p> <ul style="list-style-type: none"> <li>- coping-depression (but not coping-anxiety) motives positively predicted alcohol-related consequences, highlighting the high risk associated with coping for depression rather than anxiety. This finding is in contrast to that of V V Grant et al. (2007)</li> </ul>
Yusko et al. (2008) United States	<ul style="list-style-type: none"> <li>- To identify factors associated with binge drinking and alcohol related consequences.</li> <li>- To compare the above relationships for athlete and non-athlete samples.</li> </ul>	Cross-sectional survey	<p>392 student athletes with a mean [SD] age of 19.9 [1.3] years.</p> <p>504 student non-athletes with a mean [SD] age of 20.0 [1.4] years.</p>	DMQ-R (social, enhancement, coping, conformity)	<p>Survey measures:</p> <p>Dependent variables:</p> <ul style="list-style-type: none"> <li>- frequency of past year binge drinking episodes</li> <li>- alcohol-related problems</li> </ul> <p>Independent variables:</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- average level of stress</li> <li>- peer heavy drinking norms</li> <li>- use of protective behaviours whilst drinking (e.g., use of designated driver).</li> <li>- sensation seeking</li> <li>- mood (overall, tension-anxiety, depression-dejection, anger-hostility, vigour-activity, fatigue-inertia, and confusion-bewilderment).</li> </ul> <p>Analyses:</p> <ul style="list-style-type: none"> <li>- Chi and t tests for differences between athletes and non-athletes across a variety of variables.</li> <li>- Hierarchical regression to determine associations between variables.</li> </ul>	<p>In the combined (athletes and non-athletes) sample :</p> <ul style="list-style-type: none"> <li>- higher sensation seeking, peer heavy drinking, non-use of protective behaviours while drinking, and higher enhancement and coping motives, were associated with increased heavy drinking and alcohol related problems.</li> </ul> <p>Athletes, compared to non-athletes, reported:</p> <ul style="list-style-type: none"> <li>- increased peer heavy drinking, lower sensation seeking, and lower coping and enhancement drinking motives (small effect sizes).</li> </ul> <p>Drinking to cope and sensation seeking were more strongly associated with heavy drinking and alcohol problems for athletes compared with non-athletes, suggesting that, while athletes are generally less likely to drink to cope, those that are coping motivated are at a greater risk of harm compared to non-athletes.</p>

Table A4

*Summary of Studies that Developed New Multi-factor Motive Measures*

Authors and country of study	Main aim/research questions	Design	Sample	Methodology	Measure of motives	Summary of evidence/findings
Comasco et al. (2010) Sweden	- To identify drinking motives, from the reasons given by adolescents for using alcohol.  - To explore the links between motives and alcohol consumption and alcohol related consequences.	Pilot study: Semi-structured interview, and 3 year follow up questionnaire  Study 1: Cross-sectional survey  Study 2: Cross-sectional survey	Pilot study: n = 200 aged 15-19 years old (interview n = 200, 3 year follow up questionnaire n = 180)  Study 1: n = 5,048 aged 15-18 years  Study 2: n = 5,919 aged 15-18 years	Interview: Semi-structured interview probing personal experience with alcohol, and reasons for drinking.  Questionnaire measures: - reasons for drinking - risky consumption of alcohol (3 items from AUDIT-C) - problem behaviour  Data analysis: Drinking motives identified using exploratory factor analysis. Correlation techniques used to explore relationships between motives and alcohol use and problems.	No specific instrument name (items developed through thematic analysis of interviews) 17 reasons (to feel good, to relax, to think on something else/to forget my worries, my problems, to become calm/reduce tension, to enjoy to be drunk, to establish contacts easily, to dare more/to reduce inhibitions, to feel the pleasure/outgoing, to meet more people/to be sociable, friendly to party, to create a better atmosphere, to get drunk, to become cool, to increase aggressiveness, to have others' respect, to up a person down/to influence others to do as wanted, because others do it );  3 categories (social-enhancement, coping, dominance)	Three drinking motives identified: social-enhancement—to enhance mood or gain social rewards, coping—to reduce negative affect and tension, and dominance—to increase personal power and aggressiveness.  Social-enhancement and coping motives were positively associated with alcohol consumption and alcohol related problems. Dominance motive was negatively associated with alcohol consumption and related problems.  No gender or age differences were observed

Authors and country of study	Main aim/research questions	Design	Sample	Methodology	Measure of motives	Summary of evidence/findings
V V Grant et al. (2007) Canada	- To evaluate psychometric properties of the five factor Modified Drinking Motives Questionnaire –Revised (Modified DMQ-R) - To explain inconsistent associations between coping motives and alcohol use by differentiating the anxiety and depression related components of coping motives.	Study 1: Cross-sectional survey.  Study 2: Repeated measures survey (94.8 day interval)	Study 1: Two samples of undergraduate students (n = 762 and 603).  Mean ages were 19.3 and 19.25 years respectively.  Study 2: 169 undergraduate students with a mean age of 19.74 years.	Measures and (data analysis):  Study 1: - drinking motives - alcohol use (confirmatory factor analysis and concurrent validity of Modified DMQ-R)  Study 2: - drinking motives - alcohol use - alcohol related problems at time 2 (RAPI) (test-retest reliability and predictive validity of the Modified DMQ-R)	Modified Drinking Motives Questionnaire – Revised (Modified DMQ-R)  28 items; 5 categories (social, coping-anxiety, coping-depression, enhancement, conformity)	The five factor Modified DMQ-R demonstrated superior fit to a four factor model that combined depression and anxiety related coping motives.  Motives were endorsed in the following rank order of frequency: social, enhancement, coping-anxiety, coping-depression, and conformity. Alcohol related problems were strongest for enhancement, followed by coping-anxiety and coping-depression motives.  Benefit in dividing the coping motive into coping with anxiety, and coping with depression, as they appear related to different patterns of alcohol use: - coping-depression but not coping-anxiety was predictive of drinking quantity, when other motives had been controlled. - coping-depression was indirectly related to alcohol related problems via increased consumption, whereas coping-anxiety was directly related to alcohol related problems, when consumption was accounted for.  Modified DMQ-R found to have good concurrent and predictive validity (alcohol use and problems), and good test-retest reliability. - coping-depression and enhancement motives positively predicted quantity of alcohol use. - social and enhancement motives positively predicted frequency of alcohol use.
Graziano et al. (2012) Italy	- To test a hypothesised four factor drinking motive structure based on developmentally relevant goals for adolescents.  -Investigate gender differences in drinking motives  - To explore the link between drinking motives, drunkenness, and consumption of wine, beer, spirits and alcopop drinks.	Cross sectional design	784 adolescents aged between 15-19  Mean age was 17.6 years.	Survey measures: - drinking motives - alcohol use (lifetime, wine, beer, spirit and alcopop consumption, drunkenness)  Analysis: - confirmatory factor analysis to test hypothesised 4 factor model. - SEM and analysis of variance to test for gender differences - multiple hierarchical regression and logistic regression techniques were used to test relationships between variables.	No specific instrument name (developed from focus group study; Graziano, Bina, & Ciairano, 2010).  15 items, 4 categories (coping, conformity, experimentation/transgression, self-affirmation)	- Support was found for the hypothesised four factor model (in order of frequency; coping, experimentation/transgression, conformity, self-affirmation). - suggesting that in addition to coping and conformity, developmentally relevant goals of affirming oneself, and experimenting with and transgressing rules motivate drinking behaviour in adolescents (within this sample)  - Only conformity motives were endorsed by boys more than girls.  - Coping was associated with drunkenness and high consumption of all alcoholic beverages (particularly high alcoholic content drinks). - Conformity motives were associated with lower alcohol use (for beer but not wine) and less drunkenness. - Experimentation-transgression motives were associated with risky alcopop use. - Self affirmation motives were associated with moderate consumption and drunkenness. The authors suggest that this may be a culturally and developmentally normative and relatively unproblematic reason for drinking.

Authors and country of study	Main aim/research questions	Design	Sample	Methodology	Measure of motives	Summary of evidence/findings
Kuntsche and Kuntsche (2009) Switzerland	- To develop and validate a short form of the Drinking Motive Questionnaire-Revised (DMQ-R)	Study 1 and 2: Cross-sectional survey	Initial sample: n = 5,617 Swiss students aged 12-17 years drawn from European School Survey Project on Alcohol and drugs (ESSPA)  Confirmatory sample: n = 2,398 Swiss college students aged 18-35 years drawn from the HBSC.	Survey measures: - drinking motives - alcohol use - drunkenness - academic problems - risky sexual intercourse - violent-behaviours  Data analysis: - confirmatory factor analysis to test factor structure. - SEM to explore links with alcohol use and problems.	Drinking Motive Questionnaire – Revised Short Form (DMQ-R SF)  12 items, 4 categories (social, enhancement, conformity, coping)	4 factor solution fitted the data best, and was invariant across age, gender and culture  Concurrent validity of new measure supported through a comparison with the DMQ-R: - similar factor structure and pattern of inter-correlations between motives. - enhancement followed by coping motives were related to drunkenness. - coping motives were related to problems (academically and with risky sexual intercourse).
Kuntsche and Müller (2011) Switzerland	- To measure adolescents motives for first time drinking.  - To investigate the link between these motives and risky drinking.	Cross sectional survey design.	1,644 alcohol consuming 11-14 year olds	Survey measures - motives for first time alcohol consumption - lifetime experience of risky drinking (drunkenness, 5+ drinking)  Analysis: - Logistic regression to test associations between first time drinking motives and measures of risky drinking.	No specific instrument name (based on the DMQ-R; Cooper, 1994)  9 items, 4 categories (enhancement, coping, social and conformity)	- Most commonly reported reasons for drinking were (high to low): 'to toast' (social motive), 'to find out what effect it would have' (enhancement motive), and 'to have more fun at a party' (social motive). - Boys drank for 'curiosity' (enhancement motive) more than girls, who in turn drank more for coping reasons than boys.  - Individual reasons for drinking predicted risky drinking better than the four drinking motives, however a relatively small proportion of drunkenness (7%) and 5+ drinking (12%) was explained. - The coping related reason for drinking: 'drinking due to depression', was associated with heavy episodic drinking whilst 'to cheer you up when you had problems' was not. - Of the socially related reasons for drinking, 'fun at a party'; was associated with risky drinking, but 'to toast' was not. - Similarly, regarding enhancement motives; 'drinking because it was exciting' was associated with risky drinking, whereas 'drinking to find out what effect it would have' was not.

Authors and country of study	Main aim/research questions	Design	Sample	Methodology	Measure of motives	Summary of evidence/findings
Littlefield et al. (2010) United States	- Are changes in personality and drinking motives related to each other?  - Does the change in drinking motives mediate the relation between reductions in problem drinking and personality?	Longitudinal survey design (7 follow-ups over 16 years)	College students (18-35 years)  Baseline sample of 489, with a retention rate of 78% over 16 year study.	Survey measures: - drinking motives - family history of alcoholism - problematic alcoholic involvement (negative alcohol related consequences) - personality dimensions (impulsivity and neuroticism)  Data analysis: - parallel process latent growth modelling to examine whether changes in drinking motives mediate the link between personality change and problem drinking.	No specific instrument name (items based on Cahalan, Cisin, & Crossley, 1969; Sher, Wood, Crews, & Vandiver, 1995)  5 items, 2 categories (coping, enhancement)	Developmental trajectories: - mean changes in impulsivity, neuroticism, coping motives, enhancement motives and alcohol problems were observed over the period of young adulthood. - all variables decreased from age 18 to 29, and then either climbed (neuroticism and coping), or stayed flat (impulsivity, enhancement and alcohol problems) from age 29 to 30.  Mediation: - changes in coping (but not enhancement) motives were found to mediate the relationship between personality change (impulsivity and neuroticism) and alcohol problems. - changes in coping may explain the 'maturing out' of alcohol problems.
Lindgren et al. (2011) United States	- To study drinking motives using a variety of implicit measures.	Cross-sectional design	56 Asian-American undergraduate students. Mean [SD] age of 20.7 [1.8] years.	Implicit Association Tests (IAT) and survey completed in one computer laboratory session.  Survey measures: - coping and enhancement drinking motives - desire to approach alcohol - alcohol consumption  IAT tests: - approach IAT - cope IAT - enhance IAT  Data analysis: - Count regression analysis provided information about the unique association of implicit measures of drinking motives on alcohol outcome variables.	Implicit measure of coping and enhancement motives: - approach IAT - cope IAT, and - enhance IAT (based on methodology described by Greenwald et al., 1998)  Explicit measure of coping and enhancement motives: - DMQ-R	- Approach IAT scores did not predict unique variance in alcohol consumption, however the explicit measure of one's desire to approach alcohol did.  - Both implicit (IAT) and explicit (DMQ-R) measures of coping and enhancement motives uniquely predicted variance in drinking outcomes.

Authors and country of study	Main aim/research questions	Design	Sample	Methodology	Measure of motives	Summary of evidence/findings
Mihic et al. (2009) Canada	- to investigate the relationship between situation specific and general drinking motives and alcohol related aggression, controlling for alcohol consumption and distress level.  - to explore gender differences in the above relationships.	Cross-sectional survey  Data obtained from the Canadian Campus Survey in 2004	6282 university students. Mean [SD] age of 21 [1.8] years.	Measures: Level 1 variables - situational drinking motives - alcohol related argument or fight - alcohol intake - situational features: - including drinking circumstance, location, number of places, with a meal, partner present.  Level 2 variables - most common drinking motive - alcohol use - risky drinking - psychological distress - perception of peer drinking norms  Level 3 variables - city size (small, mid size)  Data analysis: - hierarchical multilevel modelling	No specific instrument name (categories based on the DMQ-R; Cooper, 1994)  7 items, 5 categories (social, coping, enhancement, aesthetic, other). Although no specific method of classifying items provided in paper.  Only the most predominant motive for drinking was measured (within each drinking situation).	- Most common motives reported were social, aesthetic, coping followed by enhancement  Compared to social motives: - coping was linked with increased aggression, but only when measured as a situation specific motive. Leading to the suggestion that that "coping is seen as a response to specific situations rather than a stable individual characteristic" (cf Cooper, 1994 and others who suggest that internal coping motives are more stable and less sensitive to changes within the drinking context). - enhancement was linked with increased aggression, but only when measured at the respondent level (ie as a trait-like motive) - aesthetic motives decreased the risk of aggression when measured as a situation specific motive and a general motive. - no gender differences were observed.
Novik et al. (2011) United States	- To examine the relationship between drinking motivations and unwanted sexual advances towards college students.	Cross sectional survey design.	289 alcohol consuming university students (median age was 18 years)	Online survey measures: - drinking motives - frequency of unwanted sexual advances perceived to be as a result of others alcohol consumption - recent substance use (illegal drug use, binge drinking)  Analyses: - exploratory factor analysis to develop motive measure. - logistic regression to examine relationship between multiple predictor variables (motives, demographics, substance use) and experience of unwanted sexual advances.	No specific instrument name (based on the Social Context of Drinking Scale; Thombs et al., 1993)  11 items (each with dichotomous never or ever response options), 3 categories (social ease, social image, and emotional distress).	For females only: - an increased risk of experiencing an unwanted sexual advance was associated with having a recent binge episode and drinking to rid emotional distress. No association was found with other drinking motives (social ease, and social image). - binge drinking and drinking to rid emotional distress uniquely contribute to an increased risk of unwanted sexual advances.

Authors and country of study	Main aim/research questions	Design	Sample	Methodology	Measure of motives	Summary of evidence/findings
Ostafin and Marlatt (2008)  United States	- To determine whether experiential awareness and acceptance moderate the relationship between automatic alcohol motivation and hazardous drinking.	Cross-sectional design	50 alcohol using college students with a mean [SD] age of 19.97 [2.47] years.	Measures: - automatic alcohol motivation - hazardous drinking (1 month heavy episodic drinking) - mindfulness (acceptance, awareness)  Data analysis: - Hierarchical regression analysis to determine nature of relationships between variables.	No specific instrument name provided (based on methodology described by Greenwald et al., 1998)  - Automatic alcohol motivation. Computer-based procedure assessing participants' automatic approach/avoidance orientation towards alcohol use.	The two components of mindfulness moderated the relationship between automatic drinking motivation and hazardous drinking differently.  As expected: - Experiential acceptance was associated with a reduced positive relationship between automatic alcohol motivation and hazardous drinking. - Experiential awareness was associated with an increased positive association between automatic alcohol motivation and hazardous drinking.  - Mindfulness training may increase one's hazardous drinking via an increased awareness of one's motivation to drink, but reduce one's hazardous drinking when experiential acceptance is also fostered.

Table A5

*Summary of Studies that Identified Groups of Motives based on Within-person Variables.*

Authors and country of study	Main aim/research questions	Design	Sample	Methodology	Measure of reasons/motives for drinking	Summary of evidence/findings
Coffman et al. (2007) United States.	<ul style="list-style-type: none"> <li>- To identify specific person centred profiles of reasons for drinking given by high school seniors.</li> <li>- To explore gender differences in drinking reason profiles</li> <li>- To explore the link between an individual's profile of drinking reasons and target behaviours.</li> </ul>	<p>Cross-sectional survey.</p> <p>Questions administered as a part of the Monitoring the Future (MTF) survey by the University of Michigan's Institute for Social Research</p>	1877 twelfth graders who had used alcohol in the last 12 months (no age data reported)	<p>Measures:</p> <ul style="list-style-type: none"> <li>- reasons for drinking</li> <li>- alcohol-related high risk behaviour (early initiation of alcohol use, past year drunkenness, drinking before 4 pm)</li> </ul> <p>Data analysis:</p> <ul style="list-style-type: none"> <li>- Latent class analysis used to identify discrete groups of drinkers based on their pattern of drinking reasons.</li> <li>- Regression analyses to determine associations between motive groups and other variables.</li> </ul>	<p>No specific instrument name (with no source cited).</p> <p>"What have been the most important reasons for your drinking alcoholic beverages?" with a choice of 15 response items (p. 243)</p>	<ul style="list-style-type: none"> <li>- 4 distinct latent classes of drinking reason profiles were identified for both boys and girls: experimenters, thrill-seekers, multi-reasoners and relaxers.</li> <li>- Girls had greater odds of being classed as experimenters, and boys had a greater odds falling into the multi-reasoner class.</li> <li>- Experimenters were the most normative and populous of these groups and were associated with the lowest alcohol-related risk, followed by relaxers, thrill-seekers and multi-reasoners.</li> <li>- Multi-reasoners (those who offered many reasons for drinking) were least populous, but were associated with early initial use of alcohol, frequent drunkenness, and drinking prior to 4pm.</li> </ul>
Mackie et al. (2011) United Kingdom	<ul style="list-style-type: none"> <li>- To identify classes of drinkers based on twin and siblings self-reported drinking motives.</li> <li>- To explore the different class associations with emotional and behavioural variables.</li> <li>- To determine the relative genetic and environmental influences to individual differences in classes of motivated drinkers.</li> </ul>	<p>Longitudinal questionnaire design. Three waves of data were collected (over 2yrs 8mths) and data from the last two waves were analysed.</p> <p>Motive measure only collected at wave 3.</p>	1422 adolescent twins and siblings	<p>Survey measures:</p> <ul style="list-style-type: none"> <li>- drinking motives</li> <li>- depression</li> <li>- anxiety</li> <li>- anxiety sensitivity</li> <li>- aggression and delinquency</li> <li>- alcohol use (quantity x frequency score)</li> </ul> <p>Data analyses:</p> <ul style="list-style-type: none"> <li>- Latent Class Analysis to identify qualitatively distinct drinkers based on drinking motives.</li> <li>- Logistic regression to assess predictors of class membership</li> <li>- SEM to determine relative contribution of genetic and environmental influences.</li> </ul>	<p>Substance Use Questionnaire (R. Müller &amp; Abbet, 1991) (social, intoxication, enhancement)</p>	<ul style="list-style-type: none"> <li>- The data supported the classification of 4 latent classes of motivated drinking (family-orientated, social, enhancement/social, and coping/social)</li> <li>Class differences: <ul style="list-style-type: none"> <li>- Social motives: high genetic influence (explaining 66% of variance).</li> <li>- Family-orientated: higher in anxiety and anxiety sensitivity than social group. Highly influenced by environmental factors (explaining 75% of variance).</li> <li>- Enhancement/social: higher in externalising behaviours and depression compared to social group. Membership was predicted by elevated aggression at time 1. Somewhat influenced by heritable factors (28%) and environmental factors (20% of variance explained).</li> <li>- Coping/social: associated with most mood issues and highest alcohol consumption. Elevated depression at time 1 predicted membership in coping/social group. High genetic influence (explaining %76 of variance).</li> </ul> </li> </ul>

Authors and country of study	Main aim/research questions	Design	Sample	Methodology	Measure of reasons/motives for drinking	Summary of evidence/findings
Mun et al. (2008) United States	- To identify qualitatively similar groups of drinking young adults based on a number of variables related to alcohol use and emotional regulation.	Experimental design  But data analysed cross-sectionally	36 alcohol consuming college students aged 21-24 (no mean age reported).	Participants randomly assigned to one of three groups: - alcohol challenge (given ethanol to consume) - placebo challenge (given ethanol-like placebo) - no alcohol / control group (given mixer drink / no alcohol)  Survey measures: - drinking reasons - alcohol use (quantity and frequency)  Physical measures: - baseline heart rate (HR) - heart rate variability (HRV) in response to neutral and 5 emotional and appetitive visual cues)  Analyses: - Latent class analysis to identify qualitatively distinct drinkers based on resting HR, HRV, chronic alcohol use and reasons for drinking.	Reasons for Alcohol Use Questionnaire (disinhibition, and suppression)	- two distinct groups of drinkers were identified (high alcohol risk, and normative group)  - High alcohol risk group was characterised by higher alcohol use and increased endorsement of disinhibition and suppression drinking reasons.  - The high alcohol risk group showed high HRV changes in response to positive and negative picture cues, whereas the normative group only experienced high HRV change to only negative picture cues.  - the authors suggest that those with autonomic self-regulatory difficulties may be more motivated to use alcohol for emotional regulation
Patrick and Maggs (2010) United States	- to identify motivational profiles of individuals, based on their motives to engage in and abstain from drinking and sexual behaviour.  - to examine the association of these profiles with each other, and with health outcomes	Cross-sectional survey design	227 college students with a mean [SD] age of 18.85 [0.38] years.	Online survey measures: - motives for and against drinking - motives for and against sexual behaviour - alcohol use - alcohol problems - sexual behaviour and health - psychosocial adjustment  Analyses: - Latent class analysis of drinking and sexual behaviour motives, to identify drinking motive profiles, and sex motive profiles. - Chi-square and ANOVAs to determine differences between motive profiles, and health outcomes.	No specific instrument name provided ( based on Importance of Consequences of Drinking (ICOD) short form; (Patrick & Maggs, 2008)  22 items, 2 categories (motivations for drinking, and motivations against drinking),  Motivations for drinking: 4 subscales (fun/social, relaxation/coping, image, sex)  Motivations against drinking: 2 subscales (physical, behavioural)	Person-centred analyses identified unique motivational profiles: - 3 motivational drinking profiles (Low For / High Against Drinking; Average; and High For / Low Against Drinking) - 3 motivational sexual behaviour profiles (Low For / High Against Sex; High For / Low Against Sex; and High For with Coping / Moderate Against Sex).  Drinking and Sexual Behaviour Motivation Profiles were linked: - Low For / High Against Drinking profile with Low For / High Against Sex profile - Average Drinking profile with High For / Low Against Sex profile - High For/Low Against Drinking profile with High For with Coping / Moderate Against Sex profile. - drinking and sexual motivational structures whilst linked were somewhat distinct.  Motivational profiles were associated with various risk behaviours: - High For/ Low Against drinking motive profile was linked with neuroticism, low poor self-image, and negative alcohol-related consequences.