

Social Psychological Perspective on Binge Drinking in Young People

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Abstract

For undergraduate populations, binge drinking is a common practice and risky drinking behaviours such as these have been associated with negative consequences for individuals and society. This thesis aims to gain a better understanding of young peoples' decisions to binge drink using a social psychological perspective. Two online (N=229 and N=313) and one lab-based (N=122) longitudinal and experimental studies use quantitative methods to gather data on the binge drinking behaviour of undergraduate students at an English university, using questionnaires based on an expanded Theory of Planned behaviour (TPB) alongside experimental social identity interventions. The findings support the use of social cognitive models to the study of risky health behaviours, particularly the application of an expanded TPB to the prediction of undergraduates' binge drinking showing that it can account for between 65 and 75% of the variance in students' intentions to binge drink and between 44 and 60% of the variance in students' self-reported binge drinking behaviour. Social identity variables (e.g. self-identity) played an important role in the expanded model suggesting there is scope for further improvements. Implications for future research, including further additions to the TPB model and suggestions for interventions to reduce risky drinking are presented.

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1 Chapter 1: Overview of Chapters

This chapter will provide an overview of the chapters to follow in this thesis.

1.1 Overview of Chapter 2: Alcohol: How does it impact health, how is it consumed and how to measure it

Chapter 2 will begin with a review of the literature covering the last 20 years of data pertaining to alcohol use and its prevalence worldwide, across Europe and in the UK. Rates of alcohol consumption have changed over time and recent research will be key to understanding the current picture both locally and across the globe. The negative effects of alcohol on a persons' health (mental and physical) will be discussed as the occurrence of illness and cost to the public has increased in recent years. The chapter will conclude by discussing the many factors affecting alcohol use and how drinking behaviours have been measured. This will be important as different aspects of drinking behaviour have been difficult to capture. This chapter will provide an understanding of the impact of alcohol consumption on health, the different ways alcohol is often consumed and the ways in which the behaviour has been measured which often depends on the perspective taken in understanding the behaviour.

1.2 Overview of Chapter 3: Theories of Drinking

Chapter 3 will review the decision making processes of young people in relation to binge drinking from a social psychological perspective; including intrapersonally focussed, extra-personally focussed and integrated models of health related behaviours. A range of theories of drinking will be discussed including developmental, biological, personality, motivational, cognitive and social. More detail and comparisons regarding specific health behaviour psychosocial theories will be presented about the health belief model, protection motivation theory, self-efficacy theory, theory of reasoned action and TPB. This literature will be drawn from the last 30 years of broad social psychological and specific Theory of Planned Behaviour research. This chapter will provide evidence that the TPB will be an important and useful tool in understanding the decision making process of young people to binge drink in comparison to other theories available.

1.3 Overview of Chapter 4: The Theory of Planned Behaviour

Chapter 4 will show support for the use of the TPB as a way of understanding decisions to binge drink and explain how additional constructs have been used to improve the predictive utility of the TPB. Specifically, the additions of habit and impulsivity alongside other measures used in previous TPB research will be discussed before showing support for the addition of social identity to the model as a way to account for addition variance in binge drinking behaviour. This chapter will provide a theoretical and empirical basis for the designs of the series of novel investigations presented in the rest of this thesis.

1.4 Overview of Chapter 5: Applying an Expanded TPB to Binge Drinking

Chapter 5 will discuss adding impulsivity, habit, norms measures and identity to the TPB and will outline the details of an online questionnaire-based longitudinal study undertaken (with a one week follow-up), applying an expanded TPB to the prediction of binge drinking amongst university undergraduates. Quantitative analysis has been applied to the data. 229 undergraduates took part, both male (n=68) and female (n=161). The findings showed support for the TPB in predicting binge drinking in young people. Specifically attitudes were predictive of intentions to binge drink and intentions were predictive of self-reported binge drinking behaviour. The additional variables of habit, group identity and self-identity were important additions to the theory as they also contributed to the prediction of intentions. Habit also predicted binge drinking behaviour alongside one component of impulsivity (lack of premeditation).

1.5 Overview of Chapter 6: How does social identity influence attitude and behaviour?

Chapter 6 will explain the specifics of an experimental computer based study carried out to assess if group identity could influence young peoples' implicit and explicit attitudes towards binge drinking and possibly alter drinking behaviour. This study employed a group identity manipulation while using an expanded Theory of Planned behaviour and two implicit association tests (an arousal IAT and alcohol-identity IAT) to measure changes in the decision making process to binge drink and automatic associations with alcohol. Undergraduates at a campus University in the UK completed a lab based computer task on campus with a 1 week follow-up self-report binge drinking behaviour questionnaire. Quantitative analysis was applied to the data. 122 students took part (male n=27, female n=95). The results showed further support for the TPB predicting binge drinking in young people. Specifically attitudes were predictive of intentions to binge drink and intentions were predictive of self-reported binge drinking behaviour. The additional variable of self-identity was an important addition to the model as it also contributed to the prediction of intentions and predicted binge drinking behaviour alongside a measure of implicit arousal association. The findings also suggested participants held more favourable implicit associations with alcohol than with soft drinks and associated alcohol more with the self than when compared with water.

1.6 Overview of Chapter 7: Decisions to binge drink: The effects of language on attitude and identity

Chapter 7 will present an experimental online study testing how self-descriptive language influences attitudes, identity and behaviour in regards to binge drinking in young people. The TPB was again the foundation of the research with additional variables of habit, drinking identity (how much an individual considers drinking alcohol as part of their self-concept) and social desirability included while employing a linguistic manipulation across independent groups of participants. Undergraduates at a campus University in the UK completed an online expanded TPB

questionnaire containing the manipulation with a 1 week follow-up self-report binge drinking behaviour questionnaire. 313 students took part (male n=83, female n=230). Analysis showed support for the TPB in predicting binge drinking behaviour in young people. Specifically attitudes and subjective norms were predictive of intentions to binge drink and intentions were predictive of self-reported binge drinking behaviour. The additional variables of descriptive norms, habit, drinking identity and social desirability were important additions to the model as they also contributed to the prediction of intentions. Habit also predicted binge drinking behaviour. The findings also brought to light identity salience influenced variables in the model. For binge drinkers, identity salience increased subjective norm scores and decreased perceptions of control; and for abstainers, identity salience decreased intentions to binge drink.

1.7 Overview of Chapter 8: General Discussion

Chapter 8 will be a general discussion of the thesis. It will begin with recaps of all 3 studies included in the thesis. Then, theoretical considerations, strengths and weaknesses will be presented followed by future implications. To finish, final conclusions will be discussed.

2 Chapter 2: Alcohol: How does it impact health, how is it consumed and how to measure it

The main goals of this thesis will be to improve our understanding of how young people make decisions about whether or not to engage in binge drinking behaviour, as well as our ability to predict it. Following on from this, the thesis will aim to provide information that can be used to inform the design of future health promotional/educational activities and interventions. A useful starting point for this endeavour will be to review available psychological literature examining the extent to which alcohol permeates society in terms of prevalence of use, and patterns (or types) of use, and how alcohol use impacts upon public health. Prevalence of use can be defined as how widespread the use of alcohol is in a population and patterns of use can be defined as the ways alcohol is consumed for example binge drinking (high consumption single episodes) or dependence (psychologically or physiologically dependent on alcohol). How these are defined and researched can vary by region and binge drinking often represents a pattern of drinking that is treated differently in the literature to other patterns. The upcoming sections will examine the various patterns of use and prevalence rates worldwide before narrowing to focus on the more specific geographical regions of Europe and the United Kingdom. This will be followed by a review of relevant methodological issues in measuring alcohol behaviours like binge drinking; comparing self-report measures, blood alcohol content and drink diaries. Through a further careful review of available psychological literature the thesis will then identify core internal and external factors contributing to risky alcohol use in Europe and North America. It will also assess key theories directed at explaining risky health behaviour such as binge drinking and their unique and comparative strengths and weaknesses. Finally, the review will compare the theoretical, methodological and empirical value of these accounts with the Theory of Reasoned Action and the Theory of Planned Behaviour (TPB) to show an expanded formulation of the latter model will provide a superior theoretical, methodological and empirical account of binge drinking in populations of young people; it will also argue that further advancement in this field in terms of an improved ability to understand and predict binge-drinking will likely be best served by further expansion and adaptation to the basic premises of this demonstrably useful model. Later, the empirical chapters will explore and test specific expansions to and adaptations of the model, with specific focus on impulsivity, habit, attitudes and identity.

2.1 How alcohol is consumed: prevalence rates and patterns

It will be useful to begin by exploring the literature examining the extent to which alcohol permeates society in terms of prevalence and patterns (or types) of use. This section will first discuss prevalence rates from a global comparison to more locally here in the UK and England. It will show the UK has relatively higher rates of alcohol consumption in comparison to many countries around the World but in a European and Westernised context, rates are comparable. A similar comparison will follow with a review of the patterns of drinking and definitions of dangerous levels of consumption (including binge drinking). It will become evident that

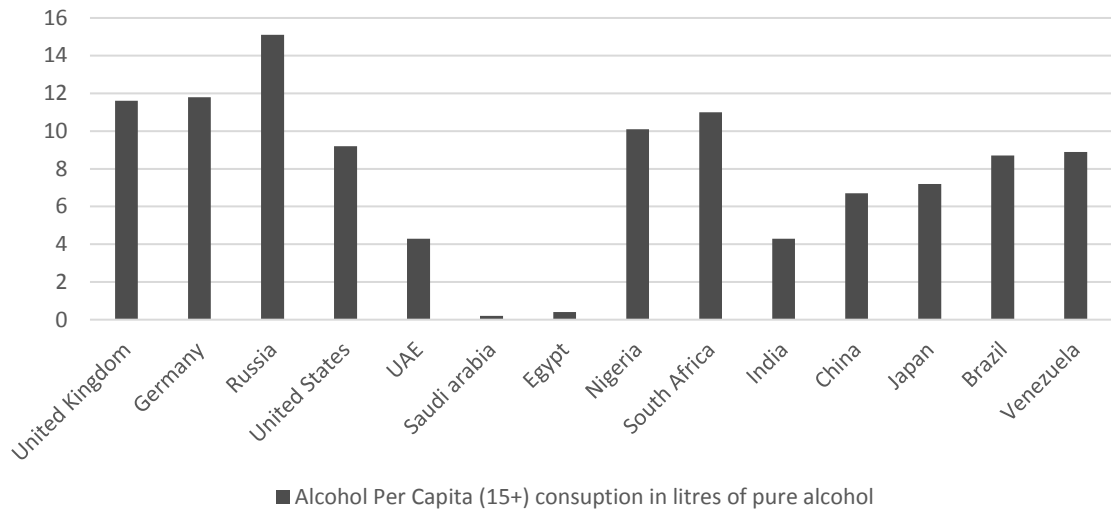
categorising levels of drinking varies greatly from country to country. A clearer picture will be given of the UK patterns of drinking before discussing what constitutes binge drinking and heavy episodic drinking more specifically. Evidence for why dangerous levels of alcohol consumption like binge drinking should be decreased will be presented here and outlining consumption in this way will provide a better understanding of the depth of the problem society has with alcohol.

2.1.1 Prevalence rates of UK alcohol consumption in comparison to countries around the world

Prevalence of alcohol use has been defined as how widespread the use of alcohol may be in a given population. It is important to understand the scope of alcohol consumption and risky single occasion drinking (RSOD) in the UK in a global context. There have been many studies on prevalence of alcohol use globally (WHO, 2014), in Europe (Hibell et al., 2012) and the UK (Kuntsche, Rehm, & Gmel, 2004; Terry-McElrath & O'Malley, 2011). Therefore, the WHO report will be the key starting point for understanding how the UK compares to other countries around the globe. The Global Status Report on Alcohol and Health by the WHO (2014), described in great detail the prevalence rates of alcohol consumption for many countries around the world (and will be discussed in further detail regarding methodology and impact of alcohol on health in section 2.2.1). This global analysis provided evidence countries vary widely in prevalence rates and was a useful tool for comparing prevalence rates for each country as it gave litres of alcohol consumed per capita in a year. For example, the prevalence rates in Saudi Arabia, a country that has prohibited alcohol altogether, reported consuming only 0.4 litres of pure alcohol per capita in a year. Whereas the United States, a country with a higher legal drinking age than the UK, had prevalence rates of 9.2 litres of pure alcohol per capita. Ireland, geographically and culturally closer to the UK than the US, consumed 11.9 litres of alcohol per capita.

Figure 2.1 on the following page, shows a graph comparing the average alcohol per capita consumption in litres of pure alcohol in 2010 for countries from various regions globally. The data for the United Kingdom of Great Britain and Northern Ireland showed alcohol consumption more similar to the United States (lower than Ireland and higher than Saudi Arabia) at 11.6 litres of pure alcohol per capita. The sexes in the UK differed with males having reported 16.5 litres and females 6.9 litres. The presence of heavy episodic drinking in the UK defined in this instance as consuming at least 60 grams or more of pure alcohol on at least one occasion in the past 30 days for *drinkers only* (those consuming alcohol in the last 12 months) was reported for males as 40.8% and for females at 25.8% with both sexes having had an average of 33.4%. This number for the *drinkers only* was higher than the population average of episodic drinking at 28%. Around 16.1% of the population reported abstaining in the previous 12 months and 15.1% reported being lifetime abstainers. As shown in Figure 2.1, the general consumption data for the UK was similar to other Westernised countries, though the heavy episodic drinking data was the key difference between

Figure 2.1 - A countries comparison of litres of alcohol consumed per capita (2010)



them. The occurrence of heavy episodic drinking was greater for the UK than the US but much lower than Ireland. Overall, consumption of alcohol has increased in the United Kingdom over the last century, but in recent years has seen a slight decrease though still remaining quite high. The consumption of beer has decreased as the consumption of wine and spirits has seen an increase. Though the alcohol of choice has changed in the UK over time, heavy episodic drinking has remained high in comparison to other countries globally warranting concern for public health.

2.1.2 Prevalence rates of UK alcohol consumption in a European context

European nations have been considered similar in respect to alcohol policies, including the UK. There has been a specific interest in university aged students for the research in this thesis, therefore, a review of European literature covering a span of 20 years of students' alcohol use at European universities by Wicki, Kuntsche, and Gmel (2010) will be discussed with findings regarding gender, age, ethnicity and other characteristics of Europeans university students. This will be followed by data in regards to the UK prevalence rates specifically. Table 2.1 displays European and UK prevalence rates from various studies, contextualising the rates and providing further evidence in the case for research into understanding drinking behaviours.

2.1.2.1 *Drinking at European universities, a review of students' alcohol use*

Wicki et al. (2010) expanded previous research on the high volumes of alcohol consumption and risky single occasion drinking (RSOD) by focusing on students' alcohol use at European universities. University students have been shown to be associated with risky drinking behaviours and most past research took place in the US and Canada. They argued European university systems differed considerably from those of the US and Canada and the drinking age in most European countries had been lower than the age in the US (21 years old). The US has consistently had a

lower prevalence of regular alcohol consumption and RSOD compared to European countries. Though these differences have existed cross culturally, prevention strategies that have been useful in the US and Canada, were thought to be useful in helping plan health promotion and prevention programs at European universities. The main goal of this review was to identify which groups of university students in Europe were at greatest risk of heavy alcohol use and RSOD. This work provided an overview of prevalence rates and individual, social and university-related characteristics of alcohol consuming university students in Europe. The findings of prevalence rates are discussed below first by gender, then age and ethnicity. This will be followed by the findings of the literature review on university-related characteristics of alcohol consuming university students.

2.1.2.1.1 Findings regarding prevalence rates by gender

Portions of the findings from Wicki et al. (2010) were broken up into a further few categories by demographics. Regarding gender, male students were more likely to use alcohol, consume at a higher frequency than female students and have a higher volume of alcohol consumption. Also, male students had greater tendency to have a high-risk average weekly consumption. More men than women reported a higher prevalence of risky single occasion drinking. Male students showed more hazardous and harmful patterns of alcohol consumption on the AUDIT (Alcohol Use Disorders Identification Test) and had higher scores on the CAGE questionnaire screening instrument for alcohol dependency. Men were more likely to screen positively for an alcohol syndrome on the PHQ-D (the German version of the Patient Health Questionnaire) and were considerably more likely to meet the DSM-IV criteria for alcohol abuse and alcohol dependence.

Some of the literature showed women consumed alcohol as frequently as men and six studies (all from the United Kingdom) found an almost equal percentage of high-risk volume drinking among male and female students alike. When applying gender-specific definitions of RSOD, two studies from the UK reported a slightly higher prevalence of risky single occasion drinking among women. There were comparatively few studies reporting an absence of gender differences. This assortment of findings suggested more research into gender differences in alcohol consumption was needed and though men appeared to be at greater risk, there was support to show women were at equal risk.

2.1.2.1.1 Findings regarding prevalence rates by age

The data regarding age in Wicki et al. (2010) suggested the volume of alcohol consumption in relation to students' age was widely varied. Two of the studies discussed in the review showed a lower association between age and risky single occasion drinking among older students.

Table 2.1 – A review of articles on alcohol prevalence in Europe and the UK showing the article title, authors, date, location, population group, percentages of each sample reporting binge drinking for male, female and/or both sexes and the definitions of drinking they used in their research.

Article	Author(s)	Date	Location	Population	Male %	Female %	Both %	Definition
HSE 2011 Volume 1 Chapter 6: Drinking Patterns	Fat, L. N. and Fuller, E.	2012	England	Adults 16+	22	13	17.5	drinking more than twice the recommended limit, at least 8/6 units (m/f) in the last week on one occasion
Global Status Report on Alcohol and Health	World Health Organization	2014	UK	15+	35.5	20.9	28	60g or more of pure alcohol on at least one occasion in the past 30 days
The public face of binge drinking: British and Danish young women, recent trends in alcohol consumption and the European binge drinking debate	Measham, F. and Ostergaard, J.	2009	UK	young women 16-24		21		above 6 units for women on at least one day in the week prior to interview
Alcohol in Europe: A Public Health Perspective	Anderson, P. and Baumber, B.	2006	Europe (EU15)	15+			33	60g of alcohol for men 40g for women, or 5 or more 'standard drinks' at least once a month
Alcohol and drug use in UK university students	Webb, E., Ashton, C. H., Kelly, P. and Kamali, F.	1996	UK	second-year university students	31	24	27.5	drinking over half the sensible units per week in one session
Adult outcomes of binge drinking in adolescence: findings from a UK national birth cohort	Viner, R. M. and Taylor, B.	2007	UK	16 yr. olds from a national cohort	35	30	32.5	occasions of consuming four or more drinks in a row in the previous 2 weeks
Living in Britain: results from the 2002 General Household Survey	Walker, A.	2002	UK	16-24	36	27	31.5	binge drinking at least once a week, more than 8 units for men and 6 for women
Establishing rates of binge drinking in the UK: Anomalies in the data	McAlaney, J. and McMahon, J.	2006	UK	16-24	57	45	51	8/6 units (m/f) in the last week on one occasion
The Prevalence of Alcohol Intoxication in the Night-Time Economy	Moore, S., Shepherd, K., Perham, N. and Cusens, B.	2007	UK	random sampling on the streets of UK Capital City	62	66	64	more than 8 units for men and 6 for women
A survey of alcohol and drug use among UK based dental undergraduates	Underwood, B. and Fox, K.	2000	UK	dental undergraduates	56	58.5	57.3	drinking half the recommended weekly units of alcohol in one session or at least seven units for women and 10 for men
Alcohol and drug use in second-year medical students at the University of Leeds	Pickard, M., Bates, L., Doran, M., Greig, H. and Saint, D.	2000	UK	Second-year medical students	60.5	72.2	66.4	drinking more than half the sensible weekly limits on one occasion during the week (10 units for men and 7 for women)
Binge drinking, sexual behaviour and sexually transmitted infection in the UK	Standerwich, K., Davies, C., Tucker, L. and Sheron, N.	2007	UK	STI Clinic attendees			86	exceeding 6 units in the previous week on a usual drinking night
Prevalence of, and factors influencing, binge drinking in young adult university under-graduate students	Morton, F. and Tighe, B.	2011	UK	undergraduates aged 18-24			92.5	males consuming 8 or more units and women consuming six or more units in once session at least once in a week

Interestingly, some of the research showed an increase in volume of alcohol consumption in relation to students' age but this could have been due to the pattern of drinking among older students where they drank frequently at more moderate levels instead of larger amounts on single occasions. A peak of scores on the AUDIT among 24-25 year old male students and 22-23 year old female students was also reported. Some of the findings were in contradiction to each other suggesting age may not be the best predictor of alcohol consumption for university aged students. This was mostly likely due to the studies having age ranges of university students that varied considerably as well as the academic years differing in workload influencing student alcohol consumption.

2.1.2.1.2 Findings regarding prevalence rates by ethnicity

Regarding ethnicity, half of non-white students reported no alcohol consumption whereas only about 5% of white students reported no alcohol consumption. The percentage of students who reported drinking a hazardous volume was five times higher among white than non-white students. Asian students had significantly lower volumes of drinking than non-Asian students. A considerably higher prevalence of drinking was found among students from established market economies such as Europe, Canada, US, Australia and New Zealand. In comparison, students from developing countries had lower prevalence rates. These findings seemed to indicate strong cultural differences between ethnicities when considering alcohol consumption.

2.1.2.1.3 Findings regarding other characteristics of alcohol consuming European students

A few other sociodemographic characteristics were important when considering alcohol consumption in university students. One of these was religious affiliation where a considerably lower prevalence of RSOD and alcohol consumption to cope with tension was found among students engaging in religious activities such as attending services or reading religious literature. Employment was also important as this was an indication of socioeconomic status. Comparing socioeconomic status and alcohol consumption, students' families' economic status was related to regular alcohol use and those with a higher disposable income were more likely to engage in RSOD. A few other important findings from the review included: the amount of students exceeding the limits they themselves estimated to be safe was 43% for females and 34% for males; the average amount of alcohol consumed in a week was twice as high among smokers as non-smokers; and the students that consumed cannabis had higher frequencies and volumes of alcohol consumption and engaged in RSOD more often. Also, illegal drug use was more common among students who consumed alcohol more frequently, in higher volumes or who were risky single occasion drinking more often. There was a range of characteristics to consider when analysing data on alcohol consumption in European university students. There were many differences in

prevalence rates between groups such as religious affiliation or smoking status showing alcohol consumption can vary for many different reasons.

2.1.3 Alcohol consumption within the UK

This section will focus on further evidence presented on the prevalence of alcohol consumption within the UK. The literature discussed here will represent data collected over the last 25 years through recent large scales studies such as the Health Survey for England (Fat, 2012) and reviews by (Gill, 2002) which reported levels of alcohol consumption and binge drinking within the UK undergraduate student population over the last 25 years. Much of the statistical data has been presented in Table 2.1 while the overall findings and trends of alcohol consumption in the UK will be discussed here.

Per-capita consumption of alcohol in the UK rose in previous decades up to 19% between 1980 and 2007 (Breakwell et al., 2007; Eurobarometer, 2010) and doubled since 1960 (Leon & McCambridge, 2006). Though there seems to have been a decline from 2002 in the proportion of men drinking more than 21 units a week on average and women drinking more than 14 units. This data suggested though alcohol consumption in the UK overall has increased, the rates of excessive drinking have been on the decline recently.

In Table 2.1, percentages of the samples binge drinking are shown alongside the definitions of heavy episodic drinking or binge drinking each study employed. The percentages of binge drinkers ranged from as low as 22% for males and 13% for females (Fat, 2012) up to 92.5% for both sexes (Morton & Tighe, 2011). There were obvious inconsistencies from study to study in defining binge drinking and this has been highlighted in other reviews of alcohol prevalence literature (Gill, 2002; Gmel, Rehm, & Kuntsche, 2003; Jewell & Sheron, 2010; Kuntsche et al., 2004). There appeared to be 3 categories of prevalence from the surveys and reviews; moderate levels of binge drinking (between 20-40%), high levels (between 40-70%) and extremely high levels of binge drinking (above 70%) in the samples. Many of the high-level and extremely high-level groups were targeted higher-risk samples such as those on a night out (Moore, Shepherd, Perham, & Cusens, 2007) or STI clinic attendees (Standerwick, Davies, Tucker, & Sheron, 2007) which would be expected to yield higher percentages of binge drinkers. University undergraduates appeared to have higher prevalence rates of heavy drinking than the general population overall (Morton & Tighe, 2011; Pickard, Bates, Dorian, Greig, & Saint, 2000; Underwood & Fox, 2000).

2.1.4 Summary of UK prevalence rates of alcohol in context

Overall, even with research showing prevalence rates have decreased in recent years, consumption of alcohol in the UK is still high particularly in a global context. The literature discussed above covers a vast amount of research about UK alcohol consumption and prevalence rates and shows many factors, from gender to ethnicity, play a role in drinking in the UK as well as across the globe. Rates in the UK and Europe appear to be higher than those in the US or Canada and men

seem to drink more than women with women in the UK particularly drinking more now than ever before. University students in the UK also drink more than other groups (e.g. similarly aged non-university students) putting them at more risk of harm. The literature did vary greatly but there is general consensus that young people's consumption rates are high and warrant concern. More detail on psychological factors contributing to the prevalence of alcohol will be discussed further in section 2.4 but first it is important to understand the way in which alcohol is typically consumed, also known as patterns of drinking.

2.1.5 **Patterns of Drinking**

Understanding the way in which alcohol is consumed is important as the impact alcohol has on the individual and society is often dose dependent. There are more and less risky ways of consuming alcohol therefore defining them will be useful. Patterns of alcohol use is defined as the ways in which alcohol is consumed. For example, *binge drinking* is a pattern of use and has been defined as high consumption single episodes whereas *dependence* has been defined as being psychologically or physiologically dependent on alcohol. From casual drinking to binge drinking, individuals consume alcohol in different ways and factors such as quantity and time are important when considering the harm alcohol consumption may cause (Rehm, Room, et al., 2003). Average volume of alcohol consumption has been correlated with measures of consequences to self and others, but also it has been important to consider the ability to predict outcomes to the self would be improved by factoring in patterns of drinking (Rehm, Rehn, et al., 2003). For example, the same overall average volume of alcohol at 2 drinks each day during a week with a meal compared to two bottles on a single occasion (effectively the same amount of alcohol) in a week makes a difference in risk outcomes. This portion of the thesis will discuss some patterns of drinking, how alcohol is consumed across Europe and in the UK as well as how countries vary in defining the parameters of alcohol consumption (e.g. what are dangerous levels of drinking?). The literature discussed here will include extensive European reports on alcohol in Europe and the UK as well as literature from the US. It is important to understand alcohol consumption causes negative health effects when consumed at risky levels and assessing what qualifies as risky levels of drinking can be difficult. This section will aim to pinpoint the general consensus on how to categorise patterns of drinking.

2.1.5.1 *Patterns of use in Europe*

Anderson and Baumberg (2006) explore the patterns of use of alcohol in Europe, showing the EU as the heaviest drinking region in the world with 11 litres of pure alcohol drunk per adult each year. Across Europe, under half of the alcohol consumed is in the form of beer with the rest divided between wine and spirits though this varies across Europe. The southern countries drink mainly wine whereas northern and central parts of Europe mainly beer. Around 40% of drinking involves consuming with a meal. Also the level of daily drinking shows a north south divide with non-daily frequent consumption, or drinking a few times in a week but not every day, is more common in

central Europe. This report shows Europe consumes more alcohol per capita than other regions of the world and how alcohol is consumed varied greatly by country and region even within Europe itself.

2.1.5.2 Patterns of use in England

To gain a more localised view of how alcohol is consumed here in England, The Health Survey for England (Fuller, 2013) outlines the NHS guidelines (NHS, 2012) surrounding alcohol consumption. This survey specifically discusses how the unit of alcohol was introduced as a means of monitoring the alcohol content of specific drinks following the concept of ‘sensible drinking.’ The recommended limits of twenty-one units per week for men and fourteen units per week for women was updated to advise on a daily basis suggesting men drink no more than three to four units per day and women only two to three units of alcohol per day. Consumption at these levels is considered ‘low risk’ whereas those drinking above these levels are considered to be at ‘increased risk’. Men regularly drinking more than eight units a day or 50 units in a week and women drinking more than six units a day or 35 in a week are at much greater risk of harm, being described as ‘high risk’ drinkers. These NHS guidelines painted a very clear picture of how England defined harmful drinking in terms of units of alcohol consumed.

2.1.5.3 An American example of patterns of drinking

Comparing definitions of risky drinking is important and Read, Beattie, Chamberlain, and Merrill (2008) argue the groupings of drinkers into a single risk category based on a low threshold may not capture the nature of problem drinking behaviours accurately. They examined the utility of delineating heavy drinkers into three separate groups; those who typically drank below the traditional ‘binge’ cut-off (less than 4+/5+ drinks per occasion for women/men), those who met traditional ‘binge’ drinking criteria (more than 4+/5+ drinks per occasion for women/men) and a higher cut-off (more than 6+/7+ drinks per occasion for women/men). Their sample consisted of US college students (undergraduates) completing a self-report questionnaire including a calendar of daily alcohol consumption. It represented an effort to offer a more fine-grained description of various drinking patterns among university students and identify particular patterns that were linked to more problematic involvement. There was evidence of clear differences in alcohol consequences between traditional binge drinking definitions and a higher threshold heavy binge drinking definition. This showed how defining levels of drinking can influence the outcomes with even small variation in definition.

2.1.5.4 Summary of patterns of drinking

This literature shows drinking patterns are linked to health outcomes and that drinking patterns differed greatly by region. The more frequently someone drinks higher quantities of alcohol, the higher the risks of having negative health outcomes. There is some disagreement about how to

define problematic drinking but the overall message taken from the literature highlights a need to designate different levels of drinking allowing a comparison of the categorised patterns and risks. The following section will discuss the difficulty in defining risky drinking practices.

2.1.6 Binge Drinking and Heavy Episodic Drinking: difficulty in defining risky drinking

Before setting out to research binge-drinking, it was crucial to define what it means to consume alcohol at risky levels. There has been a need to unify binge drinking research through the use of a specific definition of what constitutes binge drinking (Gill, 2002; Kuntsche et al., 2004). Consensus has been a problem, particularly in regards to binge drinking and the discrepancies have made it quite difficult to directly compare studies across the board and get a clear picture of the impact binge drinking has had on the population. It is possible that the definitional differences could be an explanation for the variation in numbers seen across many studies (Gill, 2002). For example, a lower threshold for classifying binge drinking (4 units in a session compared to 8 units) would include a higher percentage classified as binge drinkers as part of a sample. Some studies have used a certain number of grams consumed or number of ‘typical drinks’ and some studies have considered time as an important element (2 hours vs ‘a session’). A universal definition to use in future research would likely make binge drinking trends in the UK easier to track. The following section will review the literature defining binge drinking from different perspectives including European reviews and UK based studies over recent years. This will contextualise how binge drinking specifically has been defined regionally and locally.

2.1.6.1 Comparing definitions of binge drinking globally

Gmel et al. (2003) provide an overview of the prevalence, trends and outcomes in Europe as discussed previously but importantly gave a definition for binge drinking in a European context. They highlighted that binge drinking has different meanings in the field of alcohol. One related to the clinical definition of drinking behaviour classified as a subtype of alcoholism, a bender which meant several days of drinking and another classified it as a broader definition of bingeing meaning heavy drinking in a relatively short period of time. There were objective and subjective ways to measure alcohol consumption as well. The first was to quantify a certain amount of drinking (e.g. 5 or more drinks, 60 grams of 100% ethanol and blood alcohol levels) and second was by the degree to which the person felt intoxicated. They defined objective in terms of it being measured by biological measures or observations even through self-report. Subjective was defined in terms of dealing with feelings of drunkenness which could not be measured other than through expressions of the subjects themselves. They concluded objective measures were more convenient for between-subject comparisons, especially if they took physiological factors into account such as BAC (blood alcohol content). Subjective measures had different scopes and varied greatly from person to person leaving them more open to environmental factors like attitudes toward drinking and cultural differences.

In regards to comparisons between countries, the US studies often defined binge drinking as 5 or more drinks on a drinking occasion but this method was less common outside the country. In Canada, it ranged from 5 or more drinks to 10 or more whereas, in Australia, it was measured as 8+ for men and 6+ for women. In Europe, there were yet even more differences in definitions. In a Nordic study, 6+ drinks was used and in other European countries it was anywhere from 4+ alcoholic drinks to 13+. In the UK specifically, the cut-off was sometimes defined as 11+ drinks or 5+ in a row or in a sitting. UK studies sometimes used units instead of drinks as well. Overall, the overview highlighted in regards to objective measures of binge drinking that there was no standardised definition across or within countries regarding the number of drinks necessary to constitute a binge drinking episode. They did suggest it may be more plausible to define a binge in terms of grams of pure alcohol per occasion and used the country-specific definitions of what a standard drink contains which would give a corresponding number of drinks to use accordingly.

2.1.6.2 Differences in defining binge drinking within the UK

McAlaney and McMahon (2006) compared alcohol relevant portions of UK government funded studies such as the UK General Household Survey (Goddard & Green, 2006) and the Health Survey for England (Sproston & Primatesta, 2004). They aimed to establish consistency between results and to clarify the rates of binge drinking in the UK. They showed the GHS used the term 'heavy drinking' to describe men drinking more than 8 units and women drinking more than 6 in a day in the last week whereas HSE was slightly different still using 8/6 units respectively but more than or equal to the units which yielded higher rates of binge drinking. Many of the subsequent studies discussed adopted the same units and termed this 'binge drinking' and some used slightly higher unit amounts, up to 10 units for men and 7 for women. The article concluded additional information on binge drinking could be gained through the use of more suitable measures and the method could be employed in large scale surveys but importantly the UK should standardise recording and reporting of binge drinking behaviours. This paper was essential as it provided a critical look at the differences across the UK in measurements and rates of drinking. This confirms even within the UK there has been little consensus on how to define binge drinking.

2.1.6.3 Defining binge drinking for the purposes of this research

In social psychological research on alcohol it has been quite common to define heavy or binge drinking in terms of episodes involving five or more drinks in a row for both men and women (K. Johnston & White, 2003; Norman, 2011; Norman & Conner, 2006; Todd & Mullan, 2011) though many other methods such as units, number of standardised drinks and grams of alcohol consumed have been used. Consensus on the matter of defining a subjective measure such as binge drinking has been difficult. As shown earlier in Table 2.1, defining binge drinking varies and in reality, it may be that for the participants when given the parameters of binge drinking, find it easier to understand and recall the quantity of drinks they consumed in a given session and harder to be

aware of and compute the units or grams of alcohol they may have consumed. When considering gathering self-report data, number of drinks consumed would seem to be most appropriate due to ease of recall and understanding.

For the purposes of this research, binge drinking will be defined as 4 or more alcoholic drinks for women and 5 or more alcoholic drinks for men in a single session. This encompasses the 7/10 units and 6/8 units for women and men approach taken by some studies (as the number of units in the average alcoholic drink range between 1 and 3 units). To assist with the participants' understanding of binge drinking and its specific definition for this research, a clear indication will be laid out at the start of each study explaining the definition used and will include a list of common alcoholic beverages and the typical units contained in each.

2.2 Public Health and Alcohol

It is imperative to gain an understanding of how alcohol has impacted public health. Alcohol has been well documented as having serious implications for the health of individuals and society. In research terms it has been regarded as a risky behaviour. Some of the key research reporting the information regarding the impact of alcohol on health outcomes will now be explored. To echo the way in which prevalence rates were discussed, it will be approached from a global perspective, then a European, United Kingdom and finally from an English specific perspective. This method was used to highlight the similarities and differences in alcohol impacts around the world and bring to light the issues currently facing the UK and England regarding consumption and health.

2.2.1 Impact of alcohol on public health: a global perspective

The aim of this section is to evidence the impact of alcohol on health from a global perspective and the presented papers include recent reports and systematic reviews from the last 12 years. An understanding of the extent to which alcohol impacts health worldwide is important as it emphasises the need for improvements in policy and approaches to research for decreasing the risk of harm. These papers offer the most current information on alcohol in a global context from various organisations and authors through thorough investigations of large populations and extensive analysis of available literature beginning with the broadly encompassing *WHO Global status report on alcohol and health 2014* followed by other reports of a worldwide perspective with more focused research aims.

2.2.1.1 WHO Global status report on alcohol and health

The World Health Organization Global Status Report on Alcohol and Health (WHO, 2014) aims to provide a worldwide overview of alcohol consumption in relation to public health as well as information on: the consumption of alcohol in populations; the health consequences of alcohol consumption; and policy responses at national levels. This report defines harmful use of alcohol as “drinking that caused negative health and social consequences for the consumer or the people

surrounding the consumer as well as the society at large.” This report labels alcohol as a psychoactive substance with dependence-producing properties that is widely used in many cultures for centuries. Consumption of alcohol and problems related to alcohol have varied widely around the world as the burden for disease and death have remained significant in most countries assessed. The WHO contains information on alcohol from four regions: the Americas, Europe, Southeast Asia and the Western Pacific. Details of the methodology and findings of the WHO report will be discussed further in the following sections.

2.2.1.1.1 WHO Methodology

The WHO’s data sources include outcomes of the WHO Global Survey on Alcohol and Health questionnaire provided directly to the member states; when these were unavailable they used government documents and national statistics available in the public domain. The WHO Global Survey on Alcohol and Health questionnaire was a key data-collection tool and was implemented in combination with WHO regional and country offices, the Canadian CAMH and other academic centres and institutions. The survey was distributed to all WHO member states in 2012, with some web based, and 177 participated representing 90 percent response rate covering 97.2% of the world’s population. This was the same questionnaire method used in the previous round of WHO data collection in 2008 covering a similar percentage of the population (97.0%).

The WHO report collated as much data as possible from each country to gain better insight and get a clear picture of each country’s information on alcohol and health making it a very important robust document. Consistency also appears high for the WHO report as they distribute the same questionnaire to member states for consecutive data collections while receiving nearly identical response rates. The most significant difference in the current report from the Global status report on alcohol and health 2011 is a change in the definition of heavy episodic drinking which is newly defined as at least 60 grams or more of pure alcohol on at least one occasion in the last 30 days rather than weekly. This was carried out in order to make the indicator more sensitive to global differences in patterns of alcohol consumption.

2.2.1.1.2 WHO Findings

The WHO global status report findings discuss various factors leading to alcohol consumption, prevalence rates worldwide and health consequences. Environmental factors leading to consumption include economic development, culture, availability of alcohol and the level and effectiveness of alcohol policies. These can lead to differences and historical trends in alcohol consumption and related harm. There are also a wide range of global, regional and national policies and action in place to reduce harmful use of alcohol but even with policies in place, they show worldwide consumption in 2010 was equal to 6.2 litres of pure alcohol consumed per person aged 15 years or older and a quarter of this consumption was unrecorded through illegally produced or sold alcohol. Detailed prevalence rates can be found in Table 2.1. Worldwide 61.7% of the

population abstain from drinking with females more likely to report lifetime abstinence though these prevalence rates vary greatly across the WHO regions. Wealthier countries have higher rates of alcohol consumed and the highest rates of heavy episodic drinking. A more detailed discussion of the findings regarding health consequences and factors contributing to alcohol consumption appears in section 2.3.

2.2.1.2 Other important research on alcohol from a global perspective

There are further less comprehensive reports and review papers discussing alcohol from a global perspective that approach the issue with more focused aims than the broader WHO report. These also vary in perspective and methodology including systematic reviews and statistical modelling based on survey data and routine statistics. The following research offers alternative views and sometimes more detailed nuanced data for how alcohol is consumed and how it affects populations' health across the globe.

A review article on the global impact of alcohol on health by Rehm, Room, et al. (2003) estimates the global burden of disease attributable to alcohol by quantifying the relationships between average volume of alcohol consumption, patterns of drinking and disease and injury outcomes as well as combining exposure and risk estimates to determine regional and global alcohol-attributable fractions for major disease and injury categories. This paper is restricted to reporting on health consequences where systematic reviews are used to select diseases related to alcohol consumption followed by a meta-analysis of the relationship between alcohol consumption and disease for countries in the WHO regions. Their selection of conditions are attributable to alcohol based on a set of mostly non-independent comprehensive meta-analyses looking mainly at average volume of consumption and outcome. The disease conditions related to alcohol are grouped in three categories: wholly alcohol-attributable condition by definition (e.g. alcoholic psychoses and alcohol dependence syndrome); chronic condition where alcohol is a contributory factor (e.g. cancers and heart failure); and acute condition where alcohol is a contributory cause (e.g. injuries from road accidents and assault). Multi-level analyses of the combined data are used to determine the risk relationships between alcohol and the diseases. They provide support that alcohol consumption and pattern of use is related to many major disease outcomes such as liver disease, often in a detrimental fashion. This research is important as it shows patterns of drinking are important as they are not included in many previous studies.

In a systematic review offering an addiction perspective, Degenhardt and Hall (2012) compare the extent of illicit drug use and alcohol and the contribution they had on the global burden of disease. They summarise data for prevalence, correlates and probable adverse health consequences of problem use of amphetamines, cannabis, cocaine and opioids and attribute adverse health effects to these drugs using findings from reviews of published studies of the evidence on a range of acute and chronic harms of illicit drug use. The findings suggest many fewer people use illicit drugs than use alcohol. Though this report shows alcohol use is higher per-capita and causes more

deaths, illicit drugs use causes greater years of life lost than alcohol. This report is important as it provides evidence alcohol is still a global problem even after considering illicit drug and tobacco use. This helps to justify continued research focus on aspects of alcohol use globally as well as on a smaller scale.

Offering further worldwide data on alcohol through statistical modelling of survey data from 241 countries and territories, Shield et al. (2013) estimate the prevalence of life-time abstainers, former drinkers and current drinkers, adult per-capita consumption of alcohol and pattern of drinking scores by country and Global Burden of Disease region. The study is important because it provides data on alcohol consumption and how it varies across regions worldwide. The outcomes of this research suggest an increasing magnitude of the burden of alcohol-attributable disease and injury and that indicators of consumption are correlated with alcohol-attributable harms. Research on the factors that create variations in these indicators is required to more clearly understand the causes of variations and how to best formulate and carry out strategies aimed at reducing consumption and its impact on public health on a country and regional level.

2.2.1.3 Summary of the impact of alcohol on public health from a global perspective

Globally there is precedence for concern regarding alcohol and the persistent hardships it has caused historically. It precipitates serious health problems in societies on all continents from chronic illnesses like cancer to acute injuries such as falls or automobile accidents, and signs show this burden on health is increasing. Alcohol has also been shown to persist as problematic even after considering illicit drugs and tobacco use. The ways in which alcohol is consumed plays an important role in how it affects the health of individuals worldwide and these overall findings continue to spur research seeking ways to reduce the public risk. Though these global reports varied in methodology of data collection for consumption and prevalence rates they did show consensus that alcohol has created a continuing burden on societies around the world.

2.2.2 The impact of alcohol on public health in a European context

Understanding of the extent to which alcohol impacts health in a European context is important as it targets the Western culture relevant to this research based in the UK. The presented papers include reports covering the last 12 years offering current information on alcohol in European contexts from organisations and authors through investigations of large populations across EU countries and extensive analysis of the available literature. The largescale comprehensive report *Alcohol in Europe: A public health perspective* is discussed as it importantly focuses in detail on the history of alcohol in Europe, how alcohol is used here and how it impacts economics and health. This is an important source of information similar in scale and depth to the WHO report discussed above. This is followed by a qualitative review article on binge drinking in Europe outlining the specific health consequences pertaining to this risky level of alcohol consumption.

2.2.2.1 Alcohol in Europe: A public health perspective

Alcohol in Europe (Anderson & Baumberg, 2006) contains an expert synthesis of published reviews, systematic reviews, meta-analyses and individual papers from 2000 to 2004 collating the available data into a report highlighting health consequences across Europe while also contextualising alcohol historically and in modern times throughout the continent. Alcohol is a significant burden to life in Europe with seven million adults reporting fighting when drinking and the economic costs attributable to alcohol related crime is estimated at €33 billion across the EU. This cost includes police, courts and prisons, crime prevention and property damages but also additional intangible costs such as physical and psychological effects of crime should be taken into account. Alcohol is responsible for approximately 195,000 deaths each year in the EU but alternatively it is also estimated to delay 160,000 deaths in older individuals through cardio-protective benefits of lower-level consumption rates. A particularly important finding is young people shoulder a disproportionate amount of the burden with over 10% of young female and around 25% of young male mortality is due to alcohol. This report also emphasises the differences in regions showing drinking patterns vary across Europe with fewer southern Europeans report getting drunk each month but how each region defines binge drinking is drastically different as well. Overall, there are similarities between countries but also some complex continued differences. For example, EU countries have a set of similar policies relating to alcohol such as blood alcohol limits for drivers, licences for alcohol sales, and the existence of a minimum age for purchase. But in contrast there are differences in enforcement of drink-driving regulations, limits on availability, advertising restrictions and widely varying tax rates. There are clear gaps in action across nations but positive trends in alcohol policy are seen in Europe with drink-driving controls more commonplace in recent years. Alcohol still has a significant impact on health in Europe but the convergence of policies over time is bringing consumption levels closer and improving the public health.

2.2.2.2 Binge drinking in Europe: definitions, epidemiology and consequences

A qualitative review on binge drinking in Europe by Gmel et al. (2003) assesses whether binge drinking, regardless of definition, is associated with health and social consequences. With some difficulty, due to the lack of research in Europe pertaining to binge drinking and clear definitions of this pattern of alcohol consumption, they review literature from 1995 onwards. They find cross-cultural differences in drinking, for example, if binge drinking was not expected to be fun and not expected to be part of the drinking culture on certain occasions, people were less likely to binge. Similarly, if drunkenness was not expected to result in aggression or aggression while drunk was less acceptable culturally, less aggressive acts occurred when people were drunk. This highlights the differences across Europe in alcohol consumption and the need for a single instrument to study binge drinking cross culturally. This may prove difficult as perceptions of drunkenness and

bingeing differ but using a specific definition related to grams of alcohol or number of drinks consumed on an occasion in regards to the health consequences and not perceptions is important. Alcohol is damaging to public health whether the cultural differences and perceptions come into play or not. It may also be useful to produce country or region specific definitions. The analysis insists an intensification of research into binge drinking in European countries be completed to provide more information on the state of binge drinking in Europe. They conclude monitoring of bingeing should be implemented and made internationally comparable to allow culture-specific and culturally adequate prevention efforts. They also emphasize prevention should be made sex and age specific and should focus on bingeing as current experiences show binge drinking may develop independently of volume in different countries and thus efforts directed at reducing volume may not be sufficient.

2.2.2.3 Summary of the impact of alcohol on public health in Europe

The overall messages from these European studies on the impact of alcohol and binge drinking in Europe emphasize country and cultural differences in defining heavy drinking. There is a lack of research into how countries across Europe view risky drinking practices making it difficult to compare the impact it has on public health. The message of confusion does not dilute the seriousness of the negative health effects binge drinking is having but highlights the need for further research across nations to standardise country specific definitions to apply when researching in the future.

2.2.3 How alcohol impacts public health in the United Kingdom

The aim of this section is to contextualise alcohol use and how it impacts public health in the United Kingdom. The relevant impacts of alcohol on health and the public in this country will be directly related to how alcohol is used in this particular environment. As previously shown, alcohol consumption and binge drinking varies widely from country to country in Europe and across the globe, therefore understanding these terms as they apply to the UK specifically is important in informing the upcoming research. Though even nationally, literature regarding alcohol in the UK is varied. The research included here covers the last 20 years allowing scope for how alcohol in a UK environment may have changed in the last two decades.

To address longer term public health impacts in the UK it is important to consider research on the consequences of heavy drinking in adolescence. With longitudinal research encompassing a larger portion of the population of Britain including England, Wales, Scotland and Northern Ireland, Viner and Taylor (2007) determine outcomes in adult life of binge drinking in adolescence in a UK national birth cohort. Some of the strengths of this paper are it provides data on commonly used markers of alcohol use and abuse in adolescence and adulthood and is available on a wide range of adult outcomes. The CAGE questionnaire is used to assess alcohol abuse and dependency and the analyses are controlled for socioeconomic factors likely to bias the associations between

adolescent binge drinking and adult outcomes. This study is crucial in informing the discussion of how alcohol is a pervasive problem and risky drinking at a young age can have longer term effects which have further repercussions to the public through health care costs. This study also provides a more generalizable dataset for the UK.

Alcohol and illicit drug use among UK school children and university students has been increasing and binge drinking has also been widely reported among the student population with established associated health risks and connections with antisocial behaviour (Underwood & Fox, 2000; Webb, Ashton, Kelly, & Kamali, 1996). Comparing three papers with samples of British students and young people shows the issue is affecting universities and young people across the UK a great deal. A survey by Underwood and Fox (2000) includes UK (England specifically) based dental undergraduates (n=264) with the aim to investigate the prevalence of alcohol and drug use using anonymous self-report questionnaires, while Webb et al. (1996) includes a large sampling (n=3075) of students from 10 UK (England, Scotland and Wales) universities with a survey of information about participants' drinking, use of cannabis and other illicit drugs, other lifestyle variables and subjective ratings of anxiety and depression. Moore et al. (2007) report the prevalence of alcohol misuse in a UK (Wales) night-time economy by directly measuring blood alcohol content of the general public on the streets during a night out. The Moore et al. (2007) study is key as it measures precisely the amount of drunkenness in a real world context of 893 randomly sampled participants. Webb et al. (1996) use a larger sample, but all three of these studies lack the ability to be representative of the whole of the UK as each group is restricted by location. For example, in the case of Moore et al. (2007) only participants from the streets of Cardiff, Wales, UK are recruited and participants in the other studies are university students. These 3 studies are important though, as they highlight alcohol as an issue among young people and provide information regarding alcohol in university aged students and in real world situations using varied methods of measurement from areas across the UK.

Gaining a broader view of binge drinking across the UK especially for university undergraduates is key therefore a significant literature review by Gill (2002) pertaining to reported levels of alcohol consumption and binge drinking in the UK undergraduate population spanning 25 years is discussed. This review suggests the student population is drinking at higher levels than the similarly aged group of young people not attending university as well as their US counterparts. Male students exceed sensible weekly drinking guidelines more often than their age cohort as a whole. Female students exceed sensible guidelines three times as often as women in the general population. The literature review is quite small with only 18 studies but gives extensive information about the trends in consumption rates of UK undergraduates. It exposes the ineffective initiatives within the UK to establish and promote sensible drinking guidelines as they seem to be largely unheeded by the undergraduate students with binge drinking for many in the age group possibly perceiving it as a normal pattern of consumption.

2.2.3.1 Summary of impact of alcohol on public health in the UK

Overall this literature shows alcohol has a negative impact on health in the UK. Risky alcohol behaviours occur more often in adolescence and alcohol use is greater among young people especially undergraduates at university. There are gender differences but together, male and female undergraduates are more likely to consume alcohol at risky levels than their same aged counterparts which can lead to long term health consequences for the individual and society.

2.2.4 The impact of alcohol on public health in England

As alcohol trends vary so greatly across the world and even regionally, some England specific research is essential to the discussion. Understanding how alcohol impacts public health locally through the Health Survey for England and a smaller English undergraduate centric study will verify further the points already made, that alcohol is a public health issue in many places but more importantly here in England.

Pickard et al. (2000) investigated the alcohol and drug habits of medical students at an English university. Their research was driven by media attention on students' binge drinking habits. They found undergraduates have particularly high consumption rates creating concern these behaviours may affect academic progress and continue beyond education. They suggested greater education may be needed to advise on the risks of alcohol and drug misuse to encourage lower rates of heavy drinking. Their research provides a picture of prevalence levels in an English undergraduate population which is relevant to the current research interest.

The Health Survey for England (Fuller, 2013) presents data on alcohol consumption for adults using interviews and questionnaires and includes participants as young as 16 years of age. This survey shows most British adults consume alcohol and changes in patterns of consumption have created concern more recently as alcohol-related harm and death have risen. This survey is carried out every year and details alcohol consumption rates among adults across England (specific numerical finding for prevalence rates are discussed in section 2.1). This research is key as it outlines the country's prevalence rates and frequency of drinking and is carried out on a regular basis giving consistent data to compare over time and emphasises alcohol is a risk to public health in England.

2.2.5 Summary of the impact alcohol has on public health globally and locally

The broad themes emerging from the literature pertaining to alcohol consumption globally and locally includes a message that alcohol is an historic problem which is pervasive throughout societies around the world; it is a threat to personal health and the society; measuring rates of consumption are difficult; defining problematic drinking varies greatly; and there is a desire to seek change and control over risky drinking through researching the behaviour. The negative effects of alcohol on public health, on others and on the society as a whole are an important factor

driving the need for change. The negative connotations of alcohol consumption make it a difficult behaviour to measure as self-report measures can be questionable if the participant is unwilling to admit to the behaviour. Measures that are more reliable such as measuring blood alcohol content are practically more troublesome in real world situations burdened by equipment and cooperation from the participants. There is some debate about what measures may be most effective. Also, a disagreement on the definition of dangerous drinking is apparent across the literature with factors such as cultural differences influencing drinking habits but some guidelines and consensus could be found and is discussed in subsequent sections. There are also many ways to approach the understanding of why individuals drink alcohol. The literature converges on a combination of internal and external factors as the most effective behavioural explanations for drinking. Overall, the literature paints a clear picture of alcohol often negatively impacting public health and more should be done to research methods of decreasing risky drinking behaviours.

2.3 Specific health and societal consequences of alcohol consumption

It is vital to discuss the specific consequences alcohol can have on the physiological and mental health of individuals and on society. Most of the literature covered here will include research and reviews from the last 5 years offering up to date information on alcohol outcomes. It will also include a few of the previously mentioned large scale studies like Alcohol in Europe (2006) that were slightly older, from within the last 12 years, to gain a wealth of information collected over the years about the topic. How alcohol physically and mentally affects an individual will be discussed in detail. Then the effects alcohol consumption has had on proximal others like family and friends as well as the wider society will be discussed. ‘Others’ may include friends and family or neighbours whereas the society consists of the broader context of a collective community, city or country that may shoulder the responsibility of caring for an individual. As the effects of alcohol have been widely studied, there has been much research to discuss but the global studies will offer a starting point allowing the European and UK studies to detail a more localised description of the problems. Examples of specific health and societal consequences of risky alcohol consumption will be given. Together, this section aims to show evidence alcohol can be damaging not only to an individual but also to significant others and the society in which an individual lives.

2.3.1 Physiological Effects of alcohol on the individual

This section will discuss the positive and negative physiological effects alcohol consumption can have directly on an individual through a review of the literature including worldwide reports and targeted research such as how alcohol influences one’s sexual health. Alcohol has profound effects on the human body in a relatively short period of time because it permeates the blood brain barrier. When consumed, it can result in decreased motor function which can include slurred speech, difficulty walking and maintaining balance which may put an individual at greater risk of bodily harm. But, alcohol arguably can have benefits like decreasing anxiety and stress allowing an individual to ‘have more fun.’ Long term use of alcohol, particularly at risky levels, can lead to

more permanent damage of organs and illness. Drinking alcohol leads to over 40 medical conditions including stroke, hypertension, liver disease and heart disease (S. Robinson & Harris, 2011). The NHS (2012) shows excessive alcohol use over a prolonged period can lead to cirrhosis of the liver and premature death from accidents such as falls or motor vehicle crashes (Balakrishnan, Allender, Scarborough, Webster, & Rayner, 2009). It was also stated that in addition to the causal relationships between alcohol consumption and disease and injury, a strong association existed between alcohol consumption and HIV infection and sexually transmitted disease (Baliunas, Rehm, Irving, & Shuper, 2010). The literature encompasses broad worldwide studies, European and US focused research as well as UK studies about the physical effects alcohol has on the body making it apparent alcohol can be a harmful substance when considering the physical health of individuals.

Revisiting a global report to gain information on the physical effects of alcohol, WHO (2014) discusses many of the health conditions that result from the consumption of alcohol. These include neuropsychiatric conditions, gastrointestinal diseases, cancers, intentional injuries, unintentional injuries, cardiovascular disease, foetal alcohol syndrome, diabetes mellitus and susceptibility to infectious disease. The WHO report suggests there should be an attempt to formulate a targeted strategy to reduce the harmful use of alcohol, especially in populations where prevalence rates are higher.

Another previously discussed overview offers further details of the direct biological effects of alcohol. Rehm, Room, et al. (2003) explain that the relationship between alcohol consumption and health and social outcomes is complex and multidimensional where alcohol consumption is linked to long-term health and social consequences through three intermediate mechanisms: intoxication, dependence and direct biological effects. With intoxication an outcome of drinking, it plays a part in traffic injury and episodes of violence that result in punishment or arrests. Alcohol dependence promotes and reinforces further drinking and leads to the onset of liver cirrhosis in chronic users. Biological effects of consuming alcohol are shown to have detrimental effects like the long-term toxic effects on the liver. There is also evidence alcohol is a contributory cause to acute conditions such as road injuries, injuries from falls, fires, excessive cold, drowning, occupational and machine injuries and suicide.

A literature review by Courtney and Polich (2009) offers an account of the health consequences from a US perspective showing some direct biological effects of alcohol consumption can also be caused by cognitive impairments. The drinking culture in the US is not too dissimilar to the UK even with the higher legal drinking age (21) young people still drink at risky levels. The review summarises findings and viewpoints from the scientific binge-drinking literature discussing the data, definition and determinants of binge drinking as well as cognitive and physiological effects from a neurophysiological/neurocognitive perspective. Regarding cognitive effects, binge drinking studies show frontal lobe and working memory deficits and demonstrate delayed auditory

and verbal memory deficits related to task difficulty for heavy social drinkers. These findings imply frequent consumption of large amounts of alcohol in a single sitting, essentially binge drinking, places an individual at increased risk for suffering alcohol-related cognitive impairment. They report binge drinkers compared with non-alcohol drinkers show cognitive impairments in the Paced Auditory Serial Addition Test, executive planning function and episodic memory task while also reporting binge drinkers relative to non-binging drinkers produce errors in a spatial working memory and pattern recognition tasks. Regarding physiological effects, ethanol intake can lead to neurodegeneration in animals leading to learning and spatial memory impairment. They also show frontal white matter loss and increased parietal grey matter in the brain in human participants where consumption amounts for heavy drinkers is correlated with lower executive functioning and working memory. Overall, physiological damage to the brain caused by drinking varies and appears to be worse for continual heavy drinkers than occasional binge drinkers and these physiological effects cause cognitive deficits. This particular review encounters difficulty in comparing the data across studies as the common problem of defining risky drinking exists where separating alcohol dependence and binge drinking is necessary. It is important as it highlights the issues that contribute to the definition of binge drinking with the main variables suggesting quantity consumed and the time-frame of consumption are important factors as well as discussing effects alcohol can have on cognitive functioning as a result of physiological damage or impairment.

Referring back to Anderson and Baumberg (2006), the impact of alcohol in Europe is concerning and they show the significant burden it places on several aspects of human health. They explain that although alcohol brings with it a number of pleasures, it increases the risks of mental and behavioural disorders, immunological disorders, lung diseases, skeletal and muscular diseases and reproductive disorders, among many others. Though some conditions occurred according to a dose dependent manner, some appear only as a result of a sustained level of high alcohol consumption like cardiomyopathy, acute respiratory distress syndrome and muscle damage. Seven million adults have been in a fight while drinking. This European report made it clear that the negative effects of alcohol reach many individuals and happen regardless of consumption levels.

It is also very important to consider sexual health risks to individuals while under the influence of alcohol. A sexual health survey by Standerwick et al. (2007) look at the association between sexual risks and alcohol consumption by administering a self-report questionnaire to 520 genitourinary (GU) medicine clinic attenders in the south of England. They compare their data against the UK General Household Survey (GHS) (Goddard & Green, 2006) essentially finding the majority of attenders at a typical STI clinic binge drink to a significant extent suggesting risky sexual behaviours and heavy drinking are linked. The survey shows a link between alcohol consumption and risky sexual behaviours in young people.

To shed light on the specific health effects encountered locally in England, Fuller (2013) in the Health Survey for England, found alcohol can be identified as a causal factor in more than 60 medical conditions including cancers; cirrhosis of the liver; high blood pressure and depression and these harms are often dependent on levels of consumption with the risk of harm increasing with the amount and frequency of alcohol consumed. It is also shown alcohol increases the risk of accidents, violence and injuries. Alcohol is found to cause internal long-term health problems as well as damage or death from physical fights, trips, falls and vehicular accidents caused by impairment. The survey shows alcohol related deaths in England have risen with men more likely to die from an alcohol-related cause and these risks particularly affect men and women in the more disadvantaged social classes. This in depth report makes it clear England is no exception when it comes to experiencing adverse outcomes caused by alcohol consumption. In fact, it highlights there is reason for concern as negative health effects are occurring more frequently across the country.

Conversely, research shows support for alcohol consumption providing some protective health benefits, for example, when consumed regularly at a low-to-moderate rate it appears to infer a reduction in coronary heart disease risk (Anderson & Baumberg, 2006; Balakrishnan et al., 2009). Biological effects of consuming alcohol may include other beneficial effects on health such as promotion of blood clot dissolution (Rehm, Rehn, et al., 2003). Importantly, Anderson and Baumberg (2006) discuss some of the benefits of alcohol consumption citing small doses of alcohol consumption reduced the risk of coronary heart disease though the exact size of the reduction in risk and the level of alcohol consumption with the greatest outcomes is debated. There is also evidence low doses of alcohol can lower the risk of vascular-cause dementia, gall stones and diabetes. They mention many of the benefits of drinking are dose dependent and not all studies agree on the positive effects of alcohol therefore any conclusion to be drawn should be done with caution.

2.3.1.1 Summary of the physiological health effects of alcohol on the individual

Though there is evidence alcohol may have some beneficial health effects, it is more striking it plays such a key role in so many negative health outcomes. From causing mental and behavioural disorders to increasing the chance of risky sexual behaviours, alcohol has many adverse consequences. It is the cause of cancers, gastrointestinal diseases and liver disease among many other illnesses and in England these outcome are occurring more frequently. It has been shown through much of the literature that not only excessive or prolonged consumption of alcohol puts individuals at greater risk of health problems but even smaller amounts can cause cognitive impairments that could lead to injury. These findings further encourage a move to reduce risky drinking behaviours to improve the physical health of individuals.

2.3.2 Non-physiological effects of alcohol on the individual

Other than physical effects, alcohol affects individuals in a range of other ways. Alongside the physical harms of which drinkers are at risk of suffering, alcohol consumption is often associated with socioeconomic consequences according to WHO (2014). They highlight behavioural consequences of alcohol use for young people including individual problems defined by self-reported reduced performance in school or work, loss of money or other valuable items. Relationship problems with friends, teachers and parents are often negatively affected due to quarrels as a result of drinking. Trouble with the law and difficulties with family and school can increase the chances a young person will continue to have difficulties in adulthood.

Grant and Dawson (1997) offer analysis of longitudinal data on the relationship between age at first use of alcohol and the prevalence of lifetime alcohol abuse and alcohol dependence. This analysis identifies alcohol can negatively affect the mental health of individual users. They found young people who began drinking before age 15 to be four times more likely to develop alcohol dependence than those who began drinking at age 21. This important information could be crucial as increasing the age of first exposure could decrease dependence rates and in turn reduce negative health outcomes as well.

Read et al. (2008) carried out a study dividing students into varied drinking categories (non-binge drinkers, binge drinkers and heavy binge drinkers) to determine in which alcohol consequence (e.g. social-interpersonal consequences, self-perception, academic and occupational consequences) they differed. They define traditional binge drinking levels as 4 drinks for women and 5 for men and the heavy binge cut off of as 2 drinks above the tradition definition. A few consequences, namely academic/occupational consequences, impaired control and self-care are negatively influenced by heavy drinking. This shows further support that alcohol negatively impacts other areas of an individual's life besides physical health.

2.3.2.1 Summary of the consequences alcohol has on the individual

It was clear throughout the literature alcohol had serious physiological and non-physiological consequences for the individual. Alcohol related negative and positive outcomes are often dose dependent with negative effects increasing with higher rates of consumption and positive effects often associated with low levels of consumption. The positive effects associated with alcohol include a reduction in coronary heart disease risk and diabetes among a few others. The list of negative health effects is much longer including liver disease, gastrointestinal diseases as well as behavioural problems and poorer mental health. These negative impacts place a burden on the healthcare system and this ripple effect of problem drinking gives reason to find methods of intervention to decrease outcomes of risky alcohol consumption.

2.3.3 Effects of alcohol on the wider societal network

Alcohol has short and long term effects on the health of individuals and these outcomes may also impact others like families, friends or the general public in significant ways causing possible economic, physical or psychological harm. This wider societal network may include family members (mother, father, partner or children), friends, the criminal justice and healthcare systems or an unknown individual. The following section discusses literature mostly spanning the last 5 years with some slightly older (from the last 12 years). Some parts of specific literature has been discussed in previous section but information is not repeated here, only new relevant portions of these papers are presented. The literature ranges from large scale global reports to country specific studies offering a magnification of specific issues pertaining to the cost of alcohol consumption to the wider social network. First there is a discussion of the costs of alcohol consumption borne by family members, friends and others linked to the drinker. Then, broadening the scope, there is a discussion of how alcohol consumptions has economic and social costs to the wider public.

2.3.3.1 Costs of alcohol consumption borne by the family, friends and others linked to the drinker

Alcohol consequences often stretch beyond the individual's own health, affecting significant others like family and friends and possibly strangers. These effects could include physical, psychological and economic harm to those linked to the drinker. Some examples of immediate physical harm to others can include injury, either intentional (e.g. assault or homicide), or unintentional (a traffic crash, workplace accident or scalding of a child), property damage, toxic effects (such as foetal alcohol syndrome and preterm birth complications)(Foltran, Gregori, Franchin, Verduci, & Giovannini, 2011). Some examples of psychological harm include loss of amenity or peace of mind of family members and friends worried for the drinker's safety and neglect or abuse of those in care (WHO, 2014). The goal of this section is to give an indication of the impact of alcohol consumption on family, friends and others linked to drinkers through a mix of research from nations with similar drinking cultures to the UK like those of Europe, the US and Australia. Overall, they emphasise reducing risky drinking behaviour for the safety of not only the individual's health but importantly for the health of others as well.

Rehm, Rehn, et al. (2003) provide secondary data analysis of per capita consumption and general population surveys looking at alcohol consumption and patterns of drinking in a global context. Alongside identifying exposure by volume to be high overall with many regions globally consuming at risky levels, they discuss alcohol as a contributory cause in assaults, child abuse, road injures to others including bystanders who did not consume alcohol prior to the event. The causality for traffic accidents shows a clear link between blood alcohol content and crashes involving injury because there is a biological explanation for the relationship based on the effects of alcohol on cognitive and psychomotor performance. Alcohol and aggression are linked with fighting happening more often as alcohol consumption increases but expectations of drunkenness

and pharmacological effects of alcohol play an important role in outcomes in this area because this includes factors of other individuals involved in violence or aggression as well as personality traits of the aggressor.

An Australian survey with a representative sample provides interview survey data on how individuals are affected by others' drinking behaviours. Others in this survey included friends, relatives, co-workers and strangers. Laslett et al. (2011) show more than two thirds of people are adversely affected by someone else's drinking behaviour through abuse, threat, damage or even noise, annoyance and avoidance. About 50% of the population are negatively impacted by a stranger's drinking whereas roughly 30% report experiencing negative effects of someone close to them. Men and women overall experienced very similar numbers (72.8% v. 72.9%) in being negatively affected by any relationship type including strangers. This survey shows an individual's drinking can have a significant impact of others.

Another cross-sectional survey with a Norwegian national sample provides further data on negative consequences from other peoples' drinking with similar methods to the Australian survey though this survey only includes information referring to strangers' drinking. Rossow and Hauge (2004) find few (3.1%) experience being physically hurt by someone under the influence but more are experiencing less severe consequences such as being kept awake at night by those drinking (21.2%). Younger people are more likely to experience social consequences compared with middle-aged and elderly people and individuals that are frequently intoxicated themselves, visit public drinking places like bars and cafes are also more likely to experience more negative consequences. This survey did alternatively find gender differences in the different types of harassment experienced with women more likely than men to be harassed at parties, have clothes damages, been scolded, been frightened in the streets and kept awake. Also up to 60% of this sample did not report experiencing any type of nuisance cause by others' drinking which is contrary to the Australian results. This could be due to very different alcohol laws and drinking practices in the countries but both do importantly highlight individuals' drinking can cause great discomfort to others both psychologically and physically.

2.3.3.2 Summary of the cost of alcohol consumption on individuals other than the drinker

Harms done by another's drinking include social nuisances like being kept awake at night, marital harm, crime, violence and homicide where often the higher the level of alcohol consumption the more serious the crime or injury (Anderson & Baumberg, 2006). There seem to be two types of effects when it comes to others, psychological effects such as worry, stress or emotional abuse/neglect and physical effects such as bodily harm or even death caused by dangerous behaviours while intoxicated. The literature clearly shows hazardous levels of drinking have a serious impact on the health and wellbeing of others providing further support for discovering an effective method of reduction in drinking levels.

2.3.4 Economic and social costs of alcohol consumption borne by the public

In regards to harming the society, a key point for policy action to address harmful use of alcohol is that it results in a significant health, social and economic burden for the public (WHO, 2014). The society for the purposes of this review represents the community in which an individual lives. The negative consequences heavy drinking can have on the self may have an impact on the cost to public through damage to public spaces, private property and increased use of healthcare (Donath et al., 2012; Kuntsche, Knibbe, Gmel, & Engels, 2005). In England, 800,000 alcohol related hospital admissions occurred each year costing the NHS roughly £2.7 billion (NHS, 2012; Norman, 2011; S. Robinson & Harris, 2011). The following is a discussion of the literature detailing how alcohol impacts society.

A report on crime and social impacts of alcohol in the UK carried out by the Institute of Alcohol Studies, gathered data from many organisations including the Crime Survey for England and Wales and the Home Office (IAS, 2013). According to this report, alcohol-related crime and social disorder is estimated to cost the UK taxpayer between £8 and £11 billion per year in 2010/11. They define alcohol-related crime as offences where consumption of alcohol plays a role of some kind in the committing of the crime usually in the sense that the offender is under the influence of alcohol at the time. Specifically, this includes assault, breach of peace, criminal damage and other public order offences and they estimate that in a community of 100,000 people each year, 1,000 people will be a victim of alcohol-related violent crime. The public's perception of alcohol-related crime is that it is a significant problem to their local community and this is aided by the above figures, citing alcohol as the third major cause of criminal activity in Britain today. The IAS (2013) report also discusses the driving factors of alcohol-related crime and social disorder and importantly highlights a correlation between the density of licensed premises in a locality and the number of people present exists. This is partly explained by being in a crowd provides more opportunity for conflict with others. The report is important as it describes the drinking environment in the UK as conducive to risky drinking behaviour and lacking in discouraging conditions which could be increasingly damaging to public health and others in the community. The suggestions for change laid out include increasing alcohol prices, controlling licensing, providing enough transport (underground, taxis and buses throughout the night when drinking rates are increased) and safer bar training programmes as effective measures for decreasing alcohol-related crimes.

Referring again to the WHO report (2014), there was an increasing awareness of the significant impact of harmful use of alcohol not only on individuals but also on global public health showing 5.9% of all deaths and 5.1% of the global burden of disease and injury in 2012 was attributable to alcohol. This translates into 3.3 million alcohol attributable deaths. The cost of alcohol-related crime and anti-social behaviour is estimated by the NHS (2012) at around £7 billion a year. Societies where alcohol is forbidden for religious or cultural reason or when drinking is

thoroughly integrated into daily life with acceptable limits, breaking these boundaries causes a drinker to experience loss of earning, unemployment or family problems, stigma and barriers to accessing health care (Bennett, Jancca, Grant, & Sartorius, 1993; WHO, 2014). Harms from drinking impose significant social and economic costs to the society discussed over 3 categories specifically. The first category of costs are direct economic costs of alcohol consumption compiled directly through records from hospitals and health systems, police and criminal justice systems and unemployment and welfare systems. The direct costs for health care services are listed as hospitalisations, ambulatory care, nursing home care, prescription medicines or home health care while the justice sector costs are caused by damage to property from vehicle crashes and arrests for being drunk and disorderly as well as increased crime. Often these direct costs are borne by governments. The second major category of social costs, indirect costs, is described as resulting from loss of productivity due to absenteeism, unemployment, decreased output, reduced earning potential and lost working years due to premature pension or death. Many of these indirect costs are borne by the society at large as alcohol attributable loss in workforce productivity affects the economic viability of an entire community. The third category outlined in the report is intangible costs, defined as the costs assigned to pain and suffering which diminishes quality of life. These intangible costs are described as being borne often by the drinker themselves, their families and potentially by other individuals linked to the drinkers. Overall, the damage done to the individual drinker and subsequently the community and wider society is great and warrants concern according to WHO (2014). Addressing the problem and reducing the amount of dangerous drinking behaviour and limiting the negative effects would be beneficial.

The Alcohol in Europe (Anderson & Baumberg, 2006) review again offers more relevant information on how alcohol affects the society. The report shows alcohol places a significant burden on several aspects of human life in Europe with the economic cost of alcohol-attributable crime estimated to be 33 billion euros in the EU. This also includes property damage due to drink-driving but not the intangible costs of the psychological effects of crime on the public. Alcohol dependence causes harm to family members and harm in the workplace with the study reporting an estimated productivity lost due to alcohol-attributable absenteeism and unemployment somewhere between 6-23 billion euros each. Young people 15-16 years old report fighting and having unprotected sex due to their own drinking increasing risk of transmitting diseases or causing harm to another individual. The report suggests many of the harms caused by alcohol are shouldered by people other than the drinker themselves including underweight births and neglect of vulnerable people. This review further supports the high cost of alcohol consumption is a societal issue.

2.3.5 Summary of overall consequences of alcohol consumption on individuals and the wider society

The literature clearly shows there is a cost in caring for individuals that binge drink. This includes hospital care due to organ damage, alcohol related diseases and physical harm due to accident or assaults. Cost to employers for lost productivity and taxpayers for healthcare costs is a concern. Also, increased policing in problematic areas such as outside nightclubs or pubs where altercations are frequent adds cost to the public through the criminal justice system. The amount of money spent on combating the negative outcomes of alcohol consumption fuels a need to seek intervention to decrease risky levels of drinking. Lowering the levels of hazardous drinking will improve the health of individuals by decreasing occurrences of alcohol related illnesses such as cirrhosis of the liver or accidents including falls or car wrecks. Decreased harm from alcohol would not only put less pressure on the health system and law enforcement officials decreasing the cost to the public but also put less strain on family and friends having to care for an individual. Therefore, more should be done to understand binge drinking, how pervasive it is and how it is consumed, as this could offer an aspect to target for interventions.

2.4 Factors Affecting Alcohol Use

As most cases of initiation into alcohol use and excessive drinking occur in adolescence it is vital to establish prevention methods in this life period, however, for successful efforts to limit early and increased drinking among adolescents, the understanding of antecedents of drinking behaviour is important (Kuntsche et al., 2005). Current and historical as well as internal and external factors play a role in decisions to binge drink and there are many broader theories of drinking which take these factors into account. In regards to theory and research on substance use, it is likely the great majority of potential psychosocial risk and protective factors have been identified leaving a need to specify the processes that link risk and protective factors with substance use within individuals over time and across contexts (J. E. Schulenberg & Maggs, 2002). The following section discusses the internal and external factors influencing decision to binge drink as well as research pertaining to risk and protective factors. Dividing these factors into external and internal is a useful conceptual tool for the purposes of discussing binge drinking though it is understood that some factors may be difficult to categorise so simply. For example, a law appears as an external factor but then the knowledge of the law and beliefs built around that knowledge appear as internal factors which complicates defining each factor somewhat though every attempt to understand the factors is discussed through the existing literature. External factors such as availability of alcohol or social pressures is defined and discussed while supported by a review article assessing alcohol interventions and other important research in the field. Table 2.2 offers an overview of some of the external risk factors of alcohol use and evidence of each factor. Then there is a conclusion of how external factors influence drinking behaviours overall. This is followed by a section defining and discussing internal factors for alcohol use with further support from a review and Table 2.3

detailing risk factors and evidence. This depiction is by no means an exhaustive list of factors contributing to alcohol use as there are many reasons people drink but this aims to highlight the complexity of understanding drinking behaviour and that factors can affect an individual from the inside and out.

2.4.1 External Factors

Many external factors influence an individual's decision to binge drink. External factors have been defined as factors that influence an individual from the outside or that exist independently of the mind. These can include the broader socio-cultural factors surrounding an individual (Russell-Bennett, Hogan, & Perks, 2010) and the availability of alcohol and social contextual events such as parties. They may also include culture-specific drinking styles, the society's tolerance of public drunkenness and the television/media (Kuntsche et al., 2005; Measham & Brain, 2005; Russell-Bennett et al., 2010). Students' religious affiliation is a common reason to abstain from drinking. Some country's cultures are influenced by religion whereby the religion greatly impacts public opinion and expectancies of alcohol. These external factors are important when considering which are influencing decisions to drink therefore this section will discuss in more depth research regarding these external factors.

Hawkins, Catalano, and Miller (1992) offer a thorough review of interventions focusing on the risk and protective factors for alcohol and other drugs which highlights both internal and external factors leading to adolescent and early adulthood substance abuse. This review identifies antecedents of adolescent drug abuse including alcohol. They describe the external factors as contextual and interpersonal factors and define this as individuals and groups existing within a social context or environment with the values and structure of their society and families or friends. This aspect accounts for social normative influences. Their findings regarding these external factors are laid out in more detail in Table 2.2. More experimental research should be carried out to discover the nature of the relationships these risk factors have with alcohol use, if they are causal, correlated, unrelated and which do not contribute to the etiology of drug abuse as this review indicates a need for further research in this area. It also offers a detailed review of the available research into which risk factors are more affective in targeting for interventions and is important as it gives a clear list of antecedents of drinking behaviour.

Some external factors are considered environmental factors which influence drinking behaviours through cultural laws and rules, availability of alcohol and situational factors such as health and finances (Kuntsche et al., 2005; Russell-Bennett et al., 2010). Physical activity, physical health and knowledge about health-related consequences are considered as variables affecting alcohol use where students in good physical health drink more often and consume greater volumes than those in poor health. Higher disposable income is also a factor that is likely to increase the rate of risky single occasion drinking (RSOD) in students. When comparing the prevalence of RSOD and gross domestic product (GDP) there is a positive correlation among female students especially

(Wicki et al., 2010). Over a lifespan, a multitude of outside influences affect the decision making process to consume alcohol. Social influences, both parental and peer group, as well as situational availability of alcohol seem to be important factors in adolescence and young adult's decision to drink.

Table 2.2 shows the external risk factors for alcohol (and other substances) use taken from Hawkins et al. (1992).

External	
Risk Factor	Evidence
Laws and Norms	Taxation, laws regulating to whom and how liquor is sold, criminal laws making drugs illegal, cultural norms
Availability	Increased availability led to increased drinking prevalence, amount consumed and heavy alcohol use
Extreme economic deprivation	Poverty, parental education and occupation correlated with teen alcohol use
Neighbourhood disorganisation	Low socioeconomic status related to higher drug use and characteristics of neighbourhoods such as population density, mobility, physical deterioration, low attachment, high crime were relate to crime and drugs trafficking
Family Drug Behaviour	Parental and sibling alcoholism, use of illicit drugs increased risk of alcoholism, drugs use initiation, and drugs abuse in children
Family Management Practices	Lack of or inconsistent parental discipline, low parental educational aspirations for children predicted intitiation into drugs use
Family Conflict	Children from homes broken by martial discord were at higher risk of delinquency and drug use and family conflict was a stronger predictor of delinquency than family structure
Low Bonding to Family	Lack of parent-child closeness, lack of maternal involvement related to drug intitiation
Early and Persistent Problem Behaviours	More variety, frequency of child antisocial behaviour that persists into adulthood portends adult antisocial behaviour
School Failure	Failure in school predicted adolscent drugs abuse, frequency and levels of use of illicity drugs and good school performance reduced likelihood of frequent drugs use
Low Commitment to School	Use of a variety of drugs was significantly lower among students expecting to attend college, liking school was realted to levels of drugs use
Peer Rejection in Elementary Grades (or Primary School)	Low acceptance by peers seemed to elevate risk for school problems and criminality,
Association with Drug Using Peers	Peer use of substances was among the strongest predictors of substance use among youth
Alienation and Rebelliousness	Alienation from dominant societal values, low religiosity positively related to drugs use, deliquent behaviour and rebelliousness, resistance to traditional authority was also positively related
Early Onset of Drug Use	Misusers of alcohol began drinking earlier than users; earlier onset of drug use predicted greater and more persistent use of more dangerous drugs as well

Many of the external factors influence future internal processes, for example, historical factors (biochemical reactivity to alcohol, sociocultural environmental factors and past reinforcement) coupled with current factors (quantity and quality of current positive and negative incentives) and

situational factors (alcohol availability and drinking peers) greatly influence and help form future cognitive processes like attitude formation which built the foundations for decision making (Kuntsche et al., 2005).

2.4.1.1 Summary of external factors affecting alcohol use

Overall, the external social factors play an important role in predicting alcohol consumption implying prevention programs wishing to have an impact on adolescent drinking rates could address social antecedents of alcohol use (Ellickson & Hays, 1991). Some major factors described in the literature include culture, availability and many other social influences like familial alcohol history. Of course, the susceptibility of individuals to outside influence may depend on personal factors or internal factors therefore a combination considering both external and internal influences is important.

2.4.2 Internal Factors

Internal factors also play an important role in influencing an individual's decision to binge drink. Internal factors can be defined as those that lie within the individuals themselves (Hawkins et al., 1992). They play an important role in decisions to binge drink as these decisions are a combination of emotional and rational processes (Kuntsche et al., 2005). The factors include intrapersonal constructs such as low self-esteem, temporary anxiety, stress or depressed moods as well as an individual's beliefs about their ability to use or to avoid substances (Donath et al., 2012; Petraitis, Flay, Miller, Torpy, & Greiner, 1998). As internal influences should be considered as part of the decision making process, this section will discuss the research pertaining to internal factors that may influence decisions to binge drink.

Importantly, self-esteem is a poor predictor of heavy drinking (Ellickson & Hays, 1991). Affective states and general behavioural skills of adolescents that promote some internal motivation for substance use and that undermine their refusal skills are more distal whereas refusal skills, determination to use substances, use self-efficacy (beliefs one holds about their ability to use or not use) and refusal self-efficacy (beliefs one holds about their ability to refuse drugs or alcohol) are more proximal (Petraitis et al., 1998). Genetic susceptibility to addiction, lack of impulse control, external locus of control and personality traits also affect decisions to binge drink (Donath et al., 2012). Antecedents of hazardous drinking can be categorised dichotomously through behavioural regulation and socialisation processes (Percy & Iwaniec, 2008). Behavioural regulation is defined as an inability to self-regulate internal impulses to engage in hedonistic behaviour. Behavioural regulation and the cognitive executive functioning that underpins it is an important intermediary mechanisms linking inherited genetic vulnerability to increased levels of alcohol consumption (Percy & Iwaniec, 2008). Self-control, emotional and behavioural regulation and personality traits such as aggressiveness and anxiety are also important antecedents to drinking behaviours throughout adolescence (Pitkänen, 2006). Cognitive mediating effects (e.g. thoughts,

perceptions and memories) are other key reason for young people drinking alcohol (Kuntsche et al., 2005). Perceptions of how alcohol will change moods or enhance social situations by easing anxiety have contributed to increased alcohol use (Kuntsche et al., 2005).

Offering more details on internal factors through a literature review of European studies, Wicki et al. (2010) consider psychological characteristics as a contributor to RSOD and the findings show that students experiencing never or seldom-depressive moods have lower prevalence of problem drinking. Students with higher self-esteem are likely to engage in RSOD more often and high levels of social support is positively correlated with the frequency of alcohol consumption and of RSOD (in the UK only among male students). Aspects of impulsiveness like sensation seeking is positively associated with RSOD. Higher prevalence of RSOD exists among students who have more positive expectancies and attitudes towards alcohol consumption. The most frequent reasons or motives to consume alcohol are enhancement and social motives such as “pleasure”, to “have a good time”, or that they “liked the taste of alcoholic beverages.” Drinking alcohol to cope with tension is the strongest predictor for RSOD. The findings from Hawkins et al. (1992) that show the internal factors in detail can be seen in Table 2.3.

2.4.3 Summary of factors affecting alcohol use

Overall, there are many internal factors identified throughout the literature and some influence decisions to drink more than others such as personality or desire to relieve tension. External factors like societal norms and religion play an important role in decisions to drink as well. It has been made clear through the assessment of the literature that both internal and external factors play an important role in influencing young peoples’ decisions to binge drink. Many of the external factors such as cultural norms influence internal factors such as attitudes towards drinking. From cognitions to environment, an intervention that aims to be effective should consider several determinants of behaviour. It seems likely that a combination of factors will influence an individual’s deliberate decisions to carry out a behaviour especially with such risky behaviours like binge drinking.

2.5 Measuring Alcohol Consumption

Measuring alcohol consumption can be difficult as some methods are invasive or rely on memory which may be lacking due to the effects of alcohol. Each method has varying degrees of success where surveys are easily administered compared to collecting blood alcohol content while participants are drinking, therefore it is important to understand which methods are most commonly used and most effective in alcohol research. There are biological indicators of alcohol consumption including measuring through breathalyser tests and wearable electronic ethanol sensors and recorders; and survey measures of alcohol consumption including self-report questionnaires, computerised approaches and drink diaries (Litten & Allen, 2012).

Table 2.3 - shows the internal risk factors for alcohol use taken from Hawkins et al. (1992).

Internal	
Risk Factor	Evidence
Biochemical	Sensations seeking and low harm avoidance predict early-onset alcoholism
Biochemical	Sensations seeking, early-onset alcoholism linked to platelet monamine oxidase activity
Biochemical	Aldehyde dehydrogenase differences were found in Asians with lower rates of alcoholism than controls
Genetic	Genetic susceptibility to at least one form of alcoholism suggested by polymorphic pattern of dopamine D2 receptor Gene
Genetic	More slow-wave electroencephalogram activity in children of alcoholics than non-alcoholics
Genetic	Differences between children of alcoholics and nonalcoholics in serum prolactin response muscle response and levels of acetaldehyde after administration of alcohol
Genetic	Monozygotic twins were more than twice as likely as dizygotic twins to be concordant for alcoholism (all males)
Genetic	Concordance rates for alcoholism of 21% of monozygotic and 25% for dizygotic twins when both males and females were included
Genetic	Rates of alcoholism ranging from 18% to 27% found for adopted sons of alcoholics compared with 5% to 6% for adopted males without biological alcoholic parent
Genetic	About half of hospitalized alcoholics do not have a family history of alcoholism
Genetic	Evidence from animal studies of heritability in predisposition to barbiturate and morphine abuse
Genetic	No consistent evidence for genetic transmission of alcoholism in females reported
Intelligence	Intellectual Ability and delinquency had inverse relationships after controlling for socioeconomic status
Personality	Children who had been aggressive as first graders or aggressive and shy had higher levels of drug use than those who were just shy
Personality	Childhood traits of social inhibition, isolation and aggression not associated with adolescent drugs use stage but aggression lower inhibition and lower isolation in adolescence associated with higher drugs use stage
Attitudes	Initiation into substance use was preceded by values favourable to its use

Other methods include looking at sales figures, observations from family members or friends, capture-recapture and multiple-indicator methods. The approach of measuring alcohol consumption using self-reports has been widely used in alcohol research as well as across diverse fields of empirical research (Greenfield, 2000; Greenfield & Kerr, 2008; Heeb & Gmel, 2005; Winters, Stinchfield, Henly, & Schwartz, 1990). There is some concern among researchers about the validity of self-report methods which may weaken the intended substantive inferences to be drawn from such data (Chan, 2009). Still, self-reports of alcohol consumption have been reliable (Heeb & Gmel, 2005; K. Johnston & White, 2003; Norman, 2011; Sobell & Sobell, 1990). The

following section will cover literature discussing the many methods and difficulties of measuring alcohol consumption and why self-report will be an effective method to use in this research first through a discussion of biological measures of alcohol consumption followed by survey measures like self-report and other methods.

2.5.1 Self-report measures of alcohol consumption

Survey measures of alcohol consumption measure the level of alcohol consumed through non-biological means. This includes any self-report measure, drink diaries, questionnaires, etc. The term 'self-report' is often used to describe data obtained using paper-and-pencil questionnaires or surveys containing items that asked participants to report something about themselves and completed by the participants themselves (Chan, 2009). This is seen as a subjective measure of the participants' alcohol consumption. This form of data collection for drinking behaviour has been shown to be effective even when comparing to sales of alcohol data (Sobell & Sobell, 1995). An important study comparing versions of self-report measures for alcohol consumption is discussed followed by other literature addressing accusations of weakness for these self-report measures. It is recognised there should be caution when asking an individual to report a behaviour that may be perceived as negative but data shows that people are likely to report drinking behaviours reliably.

An experimental study by Heeb and Gmel (2005) compares self-reports of alcohol consumption obtained by graduated frequency, quantity frequency and prospective weekly diary methods in a Swiss population of at least 15 years of age. They conducted phone interviews using retrospective and prospective methods of self-report as the later was less prone to recall errors. Besides the comparisons of the differences of overall self-reported alcohol consumption, they also compare the classifications of the respondents according to their drinking status.

One particular concern of this research is recall errors affecting the accuracy of the data gathered on amount or frequency of alcohol consumption. They also discuss assessments of alcohol consumption stating they usually include quantity, frequency and variability and that differences in consumption could be related to an accurate coverage of the dimension by the assessment instrument. A point made in this article is that recalls may be plagued with errors due to the failure of retrieval such as forgetting, interfering or confusing drinking events in retrospective measure. Prospective measures are assumed to be more accurate than retrospective measures leading them to consider prospective drinking diaries in their comparative study. Drinking diaries can be completed while drinking or as close to the event as possible whereas quantity-frequency methods are often used a week, a month, a year after or even over a lifetime. Differences in self-reported alcohol consumption arise mainly because of inclusion of variability and decay of memory. The prospective measures (diaries) have lower decay of memory compared to retrospective measures and quantity frequency incorporate the least variability. Overall, the drinking diary provided the

highest consumption estimates and only modest differences between quantity frequency and graduated frequency measures suggesting variability was less important than memory decay.

A few shortcomings of the study include the findings for the diaries may be due to the higher privacy of the posted questionnaires compared with a telephone surveys. The differences may not be exclusively attributed to memory decay but also to the absence of interaction between the respondent and the interviewer resulting in a higher disclosure of consumption on the diaries. Also, the same reference periods are not used across measures which could have accounted for non-congruent estimations of drinking occasions. This study is important though as it does show support for considering different methods of gathering self-report methods of drinking behaviours.

A review analysing validity of self-report in adolescents by Winters et al. (1990) tested the validity of adolescent self-report of alcohol and drug use as researchers were concerned invalid responses like faking good or bad, inattention and random responding would hurt the reliability of the sources influencing validity. They assessed and compared across two drug clinic groups (research and non-research) and a school (research) sample with North American (both the USA and Canada) adolescents. The measure used was a subset of scales from an adolescent drug abuse questionnaire Personal Experience Inventory measuring severity and psychosocial problems often associated with involvement. The findings from this study suggested adolescent self-report was quite consistent over a one-month period but decreased over that time and that attempts by individuals to distort or bias self-report were rare. There was support for the validity of self-report drug involvement. The school sample had higher defensiveness scores which possibly indicated subjects intended to minimize or deny their self-report more than the drug clinic subjects or possibly reflected an association between self-view and social desirability. This study importantly provides another example of the difficulties in measuring the complicated responses in regards to drug and alcohol use.

The inherent nature of alcohol consumption to be highly dependent on time and personal relationships with the substance makes gathering the data complex as shown in Greenfield (2000). This paper reviewed the methodological issues in assessing the volume and patterns of alcohol consumption. In considering the degree of risk from alcohol ingestion, the length of drinking event, up to a day, gave a plausible proxy for the within-event rate of consumption as well as duration (Greenfield, 2000). They highlighted time as a major variable saying the reference period chosen needed to take into account the periodicity in drinking for example, a 10-day measure would run the risk of bias in assessing patterns varying with a 7-day cycle, since it might contain either one or two weekends. Frequency was also considered a major factor indicating how routine drinking was. Greenfield (2000) stated these are roughly correlated with blood alcohol concentration, the more proximal contributor to effects such as intoxication, conviviality, arousal, confusion, relaxation, CNS depression and acute effects are indexed only roughly to the quantity and duration of drinking because of cognitive and contextual factors as well as individual

characteristics affecting ethanol absorption and physiological response (including body water, gender, enzyme capacities, metabolism mechanisms and liver functioning and whether or not drinking occurs in association with eating). They also showed there may be difficulties with understanding the term 'drink' as a unit of measurement as container and alcohol measure size varied across communities stating use of 'drink' without careful attention to the strength and size factors could lead to underreporting.

Greenfield and Kerr (2008) reviewed and discussed measurement issues in survey assessment of alcohol consumption for epidemiological studies considering implications of cognitive studies of question answering such as self-referenced schemata of drinking, reference period and retrospective recall as well as the assets and liabilities of types of current (e.g. quantity-frequency, food frequency, graduated frequencies and heavy drinking indicators) and life-time drinking measures. They also considered units of measurement and improving measurement by detailing the ethanol content of drinks in natural settings and some of the main findings of this review were cognitive studies suggested inherent limitation in the measurement enterprise. They claimed diary studies showed promise of broadly validating methods that assessed a range of drinking amounts per occasion as well as showing improvements in survey measures of drinking in the life course while also offering support for the idea that standardizing or clarifying pour sizes and ethanol concentrations of various beverages. This highlighted the problem with using the general term 'drink' as pours at home differ from those at parties or at the bar by staff. This research is important as it shows how essential beverage-specific measurements could work as well as measures that combine into one amount all types of drinks consumed in a day or in a defined drinking session for assessing rates of heavy drinking.

2.5.2 Summary of psychosocial measure of alcohol consumption

Many recent studies using self-report measures to assess binge drinking behaviours improved the reliability of the measure by asking participants additional question about their behaviour such as what the participants typically drink each day of the previous week, how many occasions they drank or how many standard drinks did they consume on each occasion (K. Johnston & White, 2003; Norman, 2011; Norman & Conner, 2006; Shelton & Savell, 2011; Todd & Mullan, 2011). Though some behaviours can be less reliably recorded using self-reports, studies evaluating the reliability and accuracy of self-report data regarding alcohol showed these are authentic (Sobell & Sobell, 1990). As highlighted by Greenfield (2000) and Greenfield and Kerr (2008) it is not only important to consider time and frequency when asking about binge drinking but also it is important to define binge drinking in terms of amount of alcohol consumed and in what time frame as it can be interpreted subjectively by each participant. Overall, there is ample evidence self-report is a valid way of measuring binge drinking behaviour over a one-week to two-week period for young people.

2.6 Student wellbeing and alcohol

This section will draw together the prevalence and patterns of alcohol use literature with a clear focus on students and their wellbeing in relation to alcohol. Over the previous 30 years, the way in which the British public consume alcohol has been changing away from mostly male groups drinking in pubs towards a consumer drinking culture environment targeted at all 18-35s; these night-time economies include café bars, pubs and nightclubs which have developed in conjunction with a rise in determined drunkenness, or intent to achieve a certain level of intoxication (Measham & Brain, 2005). These behaviours are seemingly being supported even on university campuses where they claim to promote inclusion and safety for their students. This move toward a culture of intoxication encompasses student life therefore directly impacts upon undergraduates, emphasising why the student population should be an important focus for research.

2.6.1 Alcohol as part of student life

Alcohol has become an increasingly significant issue at universities as student numbers have been rising and a wider concern for young people's mental health and safety has developed. This concern for students' safety and wellbeing includes, as previously discussed earlier in this chapter, increased risk of sexual assault and violence. Understanding undergraduates experiences of alcohol on campus is important and Phipps and Young (2012) offers an in depth qualitative assessment on female students' experiences in higher education and helps to define and contextualise alcohol regarding campus and 'lad' culture. 'Lad' culture has been defined as involving: sport and heavy alcohol consumption; group or 'pack' mentalities; 'banter'; sexism and misogyny; homophobia; sexualisation and the objectification of women; and rape supportive attitudes and sexual harassment. These features not only create social norms and pressures for students which strengthens the relationship between alcohol and student identity but increases the amount of risky drinking and possibility of harm.

Ross et al. (2011) showed 18% of women experience sexual assault in their lifetime and alcohol consumption is linked to increased likelihood of a non-consensual sexual experience. Table 2.4, as drawn from Ross et al. (2011), shows the relationships among non-consensual sexual experiences and drinking dimensions and correlates. If alcohol is so heavily tied to student life then gaining a better understanding of the drinking behaviours of this population may help to inform better practice for university campuses regarding their alcohol policies.

Table 2.4 *Relationship among non-consensual sexual experiences (NSEs) and drinking dimensions and correlates for women with and without NSEs prior to entering college (university).*

Dimension of Alcohol Consumption	NSE Prior to Entering College?	
	No (n = 653)	Yes (n = 144)
Drinking Prevalence in the past month		
Yes	271 (41%)	34 (24%)
No	382 (59%)	110 (76%)
$\chi^2 (I, N = 797) = 15.98, p < .01$		
Binge drinking (5+ drinks in a row) in the past 2 weeks		
Yes	515 (79%)	92 (64%)
No	138 (21%)	52 (36%)
$\chi^2 (I, N = 797) = 14.58, p < .01$		
Negative drinking consequences in the past 6 months		
0-2	611 (94%)	117 (81%)
3 or more	42 (6%)	27 (19%)
$\chi^2 (I, N = 797) = 22.64, p < .01$		

2.6.2 The importance of understanding the drinking behaviours of students

Maintaining a focus on University students in this research will help to better understand the drinking behaviours of an at risk population. Adolescence is considered ‘extended’ in recent years and young people, even students, are increasingly dependent on family financial support which increases their adolescent position (About-Families, 2012; Arnett, 2000; Pimentel, 2013). This can be important from a developmental perspective as negotiating a new student environment and culture including new friends can be difficult for young people. When looking at the links to social and institutional processes, access to alcohol on university campuses is not limited and most universities in the UK run an NUS sponsored bar themselves often with subsidised prices for students further encouraging risky drinking behaviours (Phipps & Young, 2012). These actions seem contradictory when considering the apparent concern for students’ safety regarding alcohol related harms and advocating of accommodations for people with diverse religious views. Exploring what more universities could do to discourage risky levels of drinking, potentially improving campus culture from a health perspective and decreasing alcohol-related risks is important. Understanding how students cope with their changing environment at university and providing support in terms of accessibility to alcohol may be useful.

3 Chapter 3: Theories of Drinking

3.1 Theoretical approaches to understanding drinking behaviours

There are many theoretical approaches to understanding drinking therefore looking at the behaviour from different perspectives will be important. This portion of the literature review will assess theories of drinking, beginning with a developmental perspective explaining how drinking can be a key component of an adolescent's stages of development. Then, biological theory will be discussed showing how genetics and basic brain and behaviour plays a role in drinking followed by personality, motivation and cognitive theories of drinking. Finally there will be a discussion of social theories of drinking with a conclusion on how these theories can be considered together, their strengths and weaknesses and what approach would be best when considering a risky health behaviour like binge drinking.

3.1.1 Developmental theories of drinking

Alcohol use in adolescence from a developmental perspective has a history and includes a substantial amount of research (Masten, Faden, Zucker, & Spear, 2008; Patterson, DeBaryshe, & Ramsey, 1989; Pitkänen, 2006; J. E. Schulenberg & Maggs, 2002; Windle, 2000; Windle & Davies, 1999). Considering this viewpoint is important as transitioning from adolescence to young adulthood may involve new social contexts, additional roles and responsibilities, privileges opportunities and incentives for important developmental change in self-definition (J. Schulenberg, Wadsworth, O'malley, Bachman, & Johnston, 1996). For those attending university, these changes can be greater as it often involves moving away from home and decreased parental monitoring, intellectual transformations as well as shifts in social and physical environments (Ross et al., 2011).

Developmental psychologists have disagreed about the very meaning of development stemming from the differences in philosophical assumptions about humans and nature versus nurture (Reese & Overton, 1970). Some argued development is largely biological, controlled by evolution and unaffected by culture or context whereas others claimed it is a cultural phenomenon due to a lack of continuity in roles and responsibilities between childhood and adulthood. The common link between the developmental theories is that adolescence is a tumultuous time characterised by stress and self-searching including risky behaviours. Developmental theories of drinking attempt to explain binge drinking as a key component of this stage of adolescent development. The following section discusses literature pertaining to alcohol and developmental theories first through a paper focusing on the broad developmental themes during adolescence and the transition to young adulthood. Then, a discussion of how the developmental approach to understanding adolescent drinking is useful is considered alongside other support for the theory.

Beginning with a broad picture of developmental theories on drinking in adolescences is helpful in gaining insight into the foundations of the field. J. E. Schulenberg and Maggs (2002) offer such

a perspective of drinking by focusing on broad developmental themes during adolescence and the transition to young adulthood by drawing links between developmental transitions and health risks. Normative developmental transitions of adolescence and young adulthood are also reviewed with a focus specifically on fundamental biological and cognitive changes; transitions of identity; changes in affiliations with the family of origin, peers and romantic partners; and achievement transitions related to school and work. The developmental perspective is consistent with a developmental-contextual framework that emphasises development across the life span with stability and change occurring as a function of the dynamic interaction between active/reactive individuals and their active/reactive environments. Key developmental themes include person-context interactions, stability and change, distal and proximal influences and individual differences and similarities in intra-individual change which represented an important foundation for understanding how substance use fitted into young people's lives. A longitudinal theory, the developmental perspective on alcohol use assesses the progression of an individual through critical developmental transitions such as attending university where there is major individual and contextual change in every domain of life leading to the potential for discontinuity and change in functioning and adjustment (J. E. Schulenberg & Maggs, 2002).

Further support for understanding adolescent drinking through a developmental framework is provided in an article by Masten et al. (2008) which discusses the rationale for a developmental approach and examines the fundamental meaning of the approach to conceptualise underage drinking. The emergence and progression of drinking behaviours are influenced by development, underage drinking has developmental consequences and alcohol use disorders are developmental in nature. There are striking age-related patterns of alcohol use, problems, abuse and dependence where alcohol use typically begins in the second decade of life often in early adolescence, at approximately 13-14 years of age (Pitkänen, 2006). Overall, drinking at a young age is a complex behaviour occurring over a period of time within and between individuals and their environment therefore maintaining developmental processes. The developmental model accounts for antisocial and delinquent behaviour in adolescents primarily through peer influence. It attributes adolescent involvement with peers to poor parenting practices like coercive interactions and inadequate monitoring where low levels of monitoring raises the chances of adolescents associating with substance-using peers and engaging in substance use (Nash, McQueen, & Bray, 2005; Patterson et al., 1989). Heavy alcohol use and problems with alcohol tend to peak in the early to mid-20s and subside as young people move into adulthood roles and this excessive drinking accompanied by negative consequences experienced by many youth remarkably fades and in any other phase of an individual's life would be considered signs of a diagnosable alcohol abuse problem (J. E. Schulenberg & Maggs, 2002)

3.1.1.1 Summary of developmental theories of drinking

Overall, there is support that binge drinking is an artefact of adolescence and decreases in frequency with age. It appears that binge drinking is supported at this stage from a developmental perspective. An important consideration though is that this approach seems reliant on a few key aspects of other important theories, namely social and biological theories of drinking. Biological theories of drinking are discussed in more detail in the following section to identify how biological factors contribute to young people's binge drinking behaviour. Developmental theories of drinking do not explain the behaviour as much as highlight it as a stage of life and they fail to consider cognitive reasons for drinking behaviours.

3.1.2 Biological Theories of Drinking

Though the literature in this area is extensive, biological theories of drinking will be covered briefly here as the focus of the research is mainly from a social psychological perspective. Biological theories of alcohol consumption consider a stronger genetic basic brain and behaviour link to drinking where basic biological factors influence cognitions and behaviours (R. Hall, Hesselbrock, & Stabenau, 1983; Windle & Davies, 1999). Some of the physiological factors included are biochemical like aldehyde dehydrogenase differences (Borras et al., 2000; Nakamura et al., 1996) and genetic factors such as inherited susceptibility to alcoholism (Blum et al., 1990; Hrubec & Omenn, 1981). A family history of alcoholism may pose increased risk for the expression of emotional and behavioural problems among offspring for several reasons, including increased genetic risk associated with assortative mating, for example, alcoholic women marrying alcoholic men (Jacob & Bremer, 1986; Windle & Davies, 1999). There are also links between the reinforcing and locomotor-stimulating effects of the stimulants and the opiates, including alcohol, to parts of the brain that activate the dopaminergic fibres (Wise & Bozarth, 1987). Behavioural regulation and the cognitive executive functioning that underpins it also appears to be an intermediary mechanism linking genetically inherited vulnerability to alcohol and a subsequent escalation in consumption (Glantz & Leshner, 2000; Percy & Iwaniec, 2008). Many physiological factors influence drinking behaviours and the following discusses a study of biological associations of drinking.

An evaluation by R. Hall et al. (1983) of the distribution of alcoholism and other patterns of alcohol use compares the drinking styles of the ancestors of 242 US alcoholics. Associations in drinking style appeared among family members, especially those of the same sex and generation. They could not completely rule out learned or contagion effects for the behaviour but they stated that if the contagion were responsible for the correlations in drinking styles between spouses, they would not have found, like they did, correlations between their siblings or same-sex parent. This research highlights the strong links between familial patterns of alcohol use but does not determine if this is mostly genetic or environmental factors influencing drinking.

3.1.2.1 Summary of biological theories of drinking

Biological theories seem to suggest that basic states of the body are necessary conditions for most other theories where biological factors influence personality, development and environmental factors making these theories reasonable predictors of later behaviours and long term risk factors. This may be the case where biological factor may increase risk taking behaviours including binge drinking but the theories fail to take into account a range of other factors such as social influences and availability of alcohol. One important aspect to consider that is linked to biological factors is personality and the following section discusses in more detail personality theories and drinking.

3.1.3 Personality and Drinking

Although biological, psychological and social factors have been considered in relation to alcohol consumption, the general belief that personality plays an important role in this behaviour has been the focus in some research over the years (Vieth, 1999). An inability to self-regulate internal impulses to engage in hedonistic behaviour has been proposed as a key risk factor in the development of adolescent drinking problems. Young people who exhibit higher levels of impulsiveness, aggression, sensation seeking and inattention tend to be at a significantly increased risk of future alcohol problems (Dawes et al., 2000; Dawes, Tarter, & Kirisci, 1997; Percy & Iwaniec, 2008; Wills & Dishion, 2004). Considering personality as a concept to explain problem drinking behaviour is important therefore an article is discussed to show how personality can be used in this way.

With a more clinical approach regarding personality and substance use, McGue, Slutske, Taylor, and Lacono (1997) investigate the relationship between self-reported personality and alcoholism status in a large community-ascertained sample of alcoholics and controls while determining the extent to which these personality differences are moderated by gender and alcoholism subtypes. Their findings support previous research showing personality differences between alcoholics and non-alcoholics on two broad dimensions of personality behaviour, disinhibition and negative emotionality. Mean differences between the two groups on each of the scales is moderate in magnitude indicating a substantial overlap of the personality scores. Unlike some other research, there were no personality differences between the subgroup of alcoholics reporting symptoms versus those not reporting symptoms. Overall, this cross-sectional analysis of the relationship between self-reported personality and alcoholism reveals two broad dimensions of personality: negative emotionality and constraint. These are associated with alcoholism status in both genders highlighting personality as an important component of problem drinking.

3.1.3.1 Summary of personality and drinking

There seems to be some support for personality playing an important role in problem drinking, more so for addictive behaviours such as alcoholism but less so for binge drinking behaviours.

There appear to be a shortage of studies on binge drinking considering personality alone but some traits may influence the behaviour when considered only from this perspective. Also the research discussed above is unable to show whether the identified personality traits of alcohol dependent individuals developed before or after the onset of alcoholism due to the cross-sectional design. There is a lack of support for the personality approach especially regarding binge drinking but it may still play some role in drinking behaviours as personality is linked to biological influences (Anstey, Windsor, Rodgers, Jorm, & Christensen, 2005; H. J. Eysenck, 1967; Goodwin, Schulsinger, Hermansen, Guze, & Winokur, 1973). It could be that binge drinking behaviour is less dependent on personality and relies more on social and cognitive factors.

3.1.4 Motivational Theories of Drinking

Another approach to understanding drinking behaviours is through motivational theories of drinking. The concept of drinking motives is based on an assumption that individuals drink with intent to achieve a certain valued outcome, it is goal-directed (Cooper, Frone, Russell, & Mudar, 1995; Cox et al., 2002). It may be that someone will drink to relieve anxiety in social situations or to alleviate emotional or physical pain. The section discusses motivations to consume alcohol through a literature review.

To gain an understanding of motivational theories of drinking, it is important to discuss the literature review by Kuntsche et al. (2005) which provides evidence spanning 15 years of adolescent and young adult drinking motives and their relation to possible consequences. Motives are more closely associated with alcohol use in different situational contexts and these drinking motives explain a substantial amount of variance in alcohol use in addition to situational factors like drinking circumstance, location, day of the week, group size, type of relationship, local norms and residence. They found most young people reported drinking for social motives, some indicated enhancement motives and a few reported coping motives. With regards to potential outcomes, social motives appeared to be associated with moderate alcohol use, enhancement with heavy drinking and coping motives with alcohol related problems. Across the research there were definitional problems and different theoretically and empirically based measures were used. Although two of the three motive categories 'social' (positive, external), 'enhancement' (positive, internal) and 'coping' (negative, external) were integrated in all multidimensional instruments, motive to avoid social rejection (negative, external) was often ignored. Some of the motives fell under multiple categories depending on the understanding of the statement. For example, 'drinking to get high or drunk' appeared to be a powerful predictor for heavy drinking and was part of enhancement and social motivation subscales. This review clearly evidences motives appear important in adolescent drinking from the start of an individual's adoption of the behaviour, but motives become less important in adulthood when drinking habits become more established.

3.1.4.1 Summary of motivational theories of drinking

Motivational reasons for drinking appear to be more important in adolescence than in adulthood suggesting motives affect drinking in the onset of the behaviour and not the continuation of drinking. There is also evidence that internal motive such as enhancement and coping are more strongly related to personality traits showing a link between previously mentioned theories of drinking. Motivation does account for some explanation in behaviour but leaves out other key components such as elements of personality, time and social and cognitive factors. A closer look at cognitive theories of drinking is discussed in the following section.

3.1.5 Cognitive Theories of Drinking

It may be possible to gain some insight into the neurobiological mechanisms through looking at information processing which could provide pathways explaining many biological, psychological and environmental variables that have been identified as antecedents of drinking and drug use (Bandura, 1998). Cognitive factors affect future alcohol use only after young adolescents have begun to drink; perceptions are based on experience, expectations of future use and beliefs about the consequences of drinking which reflect more concrete orientations among drinkers compared to non-drinkers (Ellickson & Hays, 1991). This section will discuss the cognitive theories or thought processes involved in decisions to drink alcohol through a review and experimental study showing the applicability of using cognitive theories in explaining binge drinking behaviours.

A review focussing on developing a cognitive model as a theoretical foundation to address the issue of binge drinking by Oei and Morawska (2004) was based on the Alcohol Expectancy Theory (AET) which describes cognitive motivations for binge drinking. This enables a theoretical approach to prevention and intervention. AET stems from Social Learning Theory (Bandura & McClelland, 1977) and assumes that cognitive activities like anticipation, expectancy, memory about history of alcohol use and modelling play a primary role in determining behaviour. Youthful drinking behaviours and expectancies are formed principally through social influences of culture, family and peers while predisposing individual difference factors could interact with the influence of socialising agents. Alcohol expectancies, or beliefs about the effects of alcohol on various aspects of behaviour and cognition in the form of an if-then relationship (Goldman, Del Boca, & Darkes, 1999), are formed from research indicating the effects of alcohol are not simply a factor of alcohol's physiological effects but rather a function of the beliefs an individual holds regarding the effects. For example, the individual consuming alcohol will behave in accordance with their expectations of the alcohol's effects. Drinking refusal self-efficacy, defined as the perceived ability to refuse alcohol in specific situations rather than whether or not one drinks, is an important factor to be considered alongside alcohol expectancies. Oei and Morawska (2004) concluded a focus on the expectancies and self-efficacy cognitions held by young people can be modifiable factors in drinking. Also, public messages about alcohol can be targeted more specifically while adding the modifiable nature of the variables can serve as a starting point for informed theoretical

approaches to treatment and secondary interventions regarding binge drinking. Their review is thorough and highlights a general lack of research into cognitive approaches of predicting binge drinking behaviour specifically compared to alcohol consumption more broadly.

Testing the previously mentioned cognitive approach of the Social Learning Theory (SLT), experimental research with university students by Durkin, Wolfe, and Clark (2005) evaluated the applicability of the theory and binge drinking. SLT can be explained beginning with human behaviours being learned and much of the learning taking place in the context of primary groups such as peer groups. The details of several key elements of the learning process include differential association involving the direct association with individuals who engage in certain forms of conduct as well as the exposure to different sets of values and norms as a consequence of the association. Another component is differential reinforcement which consists of the balance of anticipated and actual rewards, punishments that follow or that are consequences of the behaviour. They can be either social or non-social. The examples of social are praise, acceptance, scorn and ridicule of friends or family members and non-social are the psychological and physical effects of drugs and alcohol. Lastly, definitions are listed as an important aspect of the learning process which are the attitudes and meaning that individuals attach to behaviour. SLT has successfully been applied to a number of empirical test and has received support previously therefore applying it to the binge drinking of college students is useful. The theory explains approximately 45% of the variance in binge drinking and importantly that binge drinkers tend to perceive that alcohol consumption will have more rewarding consequences than negative consequences. The binge drinkers also hold more positive or neutralising definition than negative definition about binge drinking. These results suggest that individuals engaged in binge drinking behaviour not only have a positive regard for the behaviour but also have attitudes that help to rationalise or justify the activity. Those with strong general beliefs are less likely to binge drink. The study is important as it shows using the social learning theory provides a useful framework for future investigations of binge drinking among university students.

3.1.5.1 Summary of cognitive theories of drinking

The overall themes suggest that cognitions play an important role in decisions to binge drink. Individual's beliefs and expectations about alcohol seem to factor into the decision making process and these beliefs and expectations are greatly influenced through social learning and experience with consumption. Finding a theoretical approach that incorporates these elements and explains more of the variance in binge drinking behaviour by including social and cognitive components is important. A discussion of social theories of drinking follows.

3.1.6 Social Theories of Drinking

Social theories of drinking are important as they provide a perspective inclusive of social determinants of drinking behaviours. Social determinants of alcohol consumption include outside

influences on the individual from cultural attitudes and laws to peer influences (Barnes, 1981; Kuntsche et al., 2005; Russell-Bennett et al., 2010). This section discusses the role of social influence on individual's decisions to binge drink, highlighting research on family influence and social normative behaviour.

An empirical study by Gossrau-Breen, Kuntsche, and Gmel (2010) provides a social perspective on adolescent risky drinking behaviours and extends the existing evidence on parental and sibling factors on adolescent alcohol use. It explores how parent-adolescent relations and older siblings' risky drinking interacts in predicting younger siblings' risky alcohol use. They aimed to fill gaps in previous research by exploring the complex interaction between parental and sibling factors on younger siblings. They also tested for a linear interaction between older sibling drunkenness and parenting measures. This work used data from the 2003 Swiss participation in the European School Survey Project on Alcohol and Drugs. An interdisciplinary research group from the participating countries developed the ESPAD (European School Survey Project on Alcohol and Other Drugs) questionnaire (Hibell et al., 2009) and had it translated into German, French and Italian. The study found participants whose older siblings had not been drunk were on average more satisfied in their relationship with their parents. They were drunk less often and had five or more drinks on a single occasion less often. Their parents more often knew where they spent Saturday evenings than those whose older siblings had been drunk. Younger siblings' risky drinking was associated with older siblings' excessive alcohol use and lower parental monitoring (Wicki et al., 2010). Low relationship satisfaction and low parental knowledge exacerbated older siblings' negative influence which resulted in the highest levels of adolescent alcohol use. This work does offer information about family factors that play a role in adolescent drinking. It would be interesting to look at what ages the siblings began drinking as well as the parental monitoring factors of the older siblings. This type of study would help show if parenting styles and monitoring are consistent.

Looking at further social aspects through alternative data collecting methods, a key paper on alcohol and parental influences by Dietze and Livingston (2010) determines whether source of alcohol supply is related to adolescent underage drinkers' reports of risky drinking and alcohol-related problem behaviours. They also examine these relationships after controlling for the influence of key individual, social and economic characteristics of respondents. The study takes place in Australia which has a similar drinking culture to the UK. This research uses data from the 2003 and 2004 Victorian Youth Alcohol and Drug Surveys (VYADS). Computer Assisted Telephone Interviews (CATI) are conducted and a variety of questions related to alcohol and other drugs are asked as well as a variety of socio-demographic questions. The question of source of alcohol is categorised as parent only, parents plus other sources and other sources only. They ask at what age the participant had their first full drink of alcohol. They also ask the participants age, gender, school/work status, language spoken at home, indigenous status and household situation. They gather information about family functioning levels and assess weekly disposable income for recreation purposes as well. The dependent variables are weekly risky single occasion drinking

(RSOD) and reports of alcohol-related problem behaviours. They define RSOD as more than six Australian Standard Drinks (ASD – 10 grams pure alcohol) for males and more than four ASD for females on any one drinking occasion at least weekly in the twelve months prior to the survey. Alcohol related problem behaviours in this study include: creating a public disturbance or nuisance, stealing something, causing damage to property, driving a motor vehicle, verbally abusing someone, physically abusing someone and attending work or school under the influence of alcohol. Participants reporting using sources other than their parents to obtain alcohol are more likely to report weekly RSOD and at least one alcohol-related problem behaviour. These findings are only slightly attenuated after controlling for the additional variables. The additional variables are: age at which participants reported their first full drink of alcohol (<10, 11-13, 14-15, 16-17 years); gender (male/female); age (16 or 17); school/work status (still at secondary school, working full time, undertaking post-school study, other); language spoken at home (English/non-English); Indigenous status (Indigenous/non-Indigenous) and household living situation (living with both parents, living with one parent, other). Having \$20 or more for recreational spending, being older and those who initiate drinking before 16 are much more likely to report RSOD and/or alcohol-related problem behaviour. Females are less likely to experience problem behaviour though they report similar levels of RSOD as males. The measures of family dysfunction are significantly positively associated with the reporting of alcohol-related problem behaviour. The use of telephone interviews in this research allow for self-report error more than an intimate interview. Face to face interviews could possibly help reliability as well as using questionnaires to gather data. The pressure to answer quickly on the phone could have inhibited the results as well. A paper questionnaire could allow more time to think about the questions and taken pressure off the participants reducing their anxiety during the measure. The study does help explain that the source of alcohol in regards to adolescent drinking is important as well as the age at which one begins drinking. These findings could be used to help educate parents/public about alcohol in the home and how their children gain access to alcohol.

3.1.6.1 Summary of social theories of drinking

To summarise social theories of drinking, socialisation processes are often viewed as external influences on decisions to binge drink and are described as specific family or significant other socialisations transmitted through norms and behaviours to the young person (Percy & Iwaniec, 2008). Parental drinking is a key predictor of alcohol onset initially but peer role models become comparatively more important in promoting continued use during adolescence (Ellickson & Hays, 1991). Cognitive factors affect future alcohol use only after young adolescents have begun to drink showing that external factors such as parental influence is extremely important initially followed by peer influence. The belief of the importance of abstaining from excessive drinking to improve health is greatest among non-drinkers and lowest among those engaging in RSOD (Wicki et al., 2010). Those engaging in RSOD are more aware of the links between high volumes of alcohol consumption and heart disease and high blood pressure. Regarding substance related factors,

students who began drinking alcohol regularly at younger ages are more likely to be drinkers, have higher levels of alcohol use and binge drink more often. Tobacco smoking is significantly positively related to higher frequency and volume of alcohol consumption and RSOD. With regard to the context of alcohol consumption and perceived social norms, alcohol consumption takes place mainly during social gatherings. More than 80% of students drink alcohol in groups of three or more, at parties/festivals, weekends in general or at home with friends. Those students who attend parties and go to pubs are at increased risk of RSOD. Alcohol is perceived to be a normal part of university life especially by male students. The frequent drinkers and those engaging in RSOD report a higher number of friends drinking alcohol on a regular basis. They also tend to overestimate their fellow students' frequency of alcohol consumption, the number of drinks consumed on a typical drinking day and the frequency of risky single occasion drinking. Students more likely to have social pressure to engage in RSOD are more likely to engage in drinking behaviour. Poor behavioural regulation appears to be moderated by parental behaviour and other sources of socialisation such as peer influence (Dawes et al., 2000; Dawes et al., 1997; Percy & Iwaniec, 2008). An individual is more proximally influenced by their family and peer groups whereas broader societal influences are more distal. Family interactions, processes and parenting are recognised as significant influences on adolescent development, behaviour and substance use (Nash et al., 2005). It seems that social aspects play a role in influencing identity, beliefs and expectations about alcohol. Overall, the research supports social influences play a major role in decisions to binge drink and should be considered when carrying out studies into the decision making process.

3.2 Health Behaviour Psychosocial Theories

It is quite clear that external and internal factors across a broad range of theories from developmental, biological to personality and social, are connected and together greatly influence the decision making process to binge drink. The literature so far shows binge drinking is more often associated with specific developmental stages while social influences such as cultural views on alcohol and significant others drinking behaviours can influence decisions to binge drink. Building on these assumptions, a model should be used taking into account both internal and external factors to explain binge drinking behaviour in young people. Many social cognitive models have been developed to predict, explain and change health behaviours on the basis that these models specify a small number of cognitive and affective factors (or beliefs and attitudes) as proximal determinants of behaviour (Sutton, 2001). This section will discuss psychosocial theories as an appropriate framework for laying a foundation for the studies. To focus on a selection of the main theories used in recent research, this discussion will include the health belief model, the protection motivation theory, self-efficacy theory, the theory of reasoned action and the theory of planned behaviour.

3.2.1 The Health Belief Model

The Health Belief Model (Becker, 1974; Janz & Becker, 1984) seeks to explain why some individuals do not use health services such as immunisation and screening. It contains four core constructs: two pertain to a specific disease and two to a possible course of action that may reduce the risk or severity of that disease. Perceived susceptibility or vulnerability is described as the person's perceived risk of contracting the disease if they are to continue on the current course of action; perceived severity is defined as how serious the disease and its consequences appear to the individual; perceived benefits refer to the possible advantages of the alternative course of action including the extent to which it reduces the risk of the disease or the severity of its consequences; while perceived barriers or costs are the possible disadvantages of adopting the recommended action or perceived obstacles that might have prevented or hindered a successful performance (Sutton, 2001). These four factors have been combined to predict the likelihood of performing a behaviour where high susceptibility, high severity, high benefits and low barriers are predictive of high probability of adopting the recommended action (Sutton, 2001). Barriers are considered the most consistent predictor of behaviour but Harrison, Mullen, and Green (1992) claim that benefits and barriers have significantly larger effect sizes in prospective compared with retrospective studies whereas severity has a significantly larger effect size in retrospective studies. Figure 3.1, drawn from Sharafkhani, Khorsandi, Shamsi, and Ranjbaran (2014), shows the schematic for the Health Belief Model with perceived benefits vs perceived barriers, perceived threat, self-efficacy and cues to action predicting the likelihood of engaging in a health promoting behaviour.

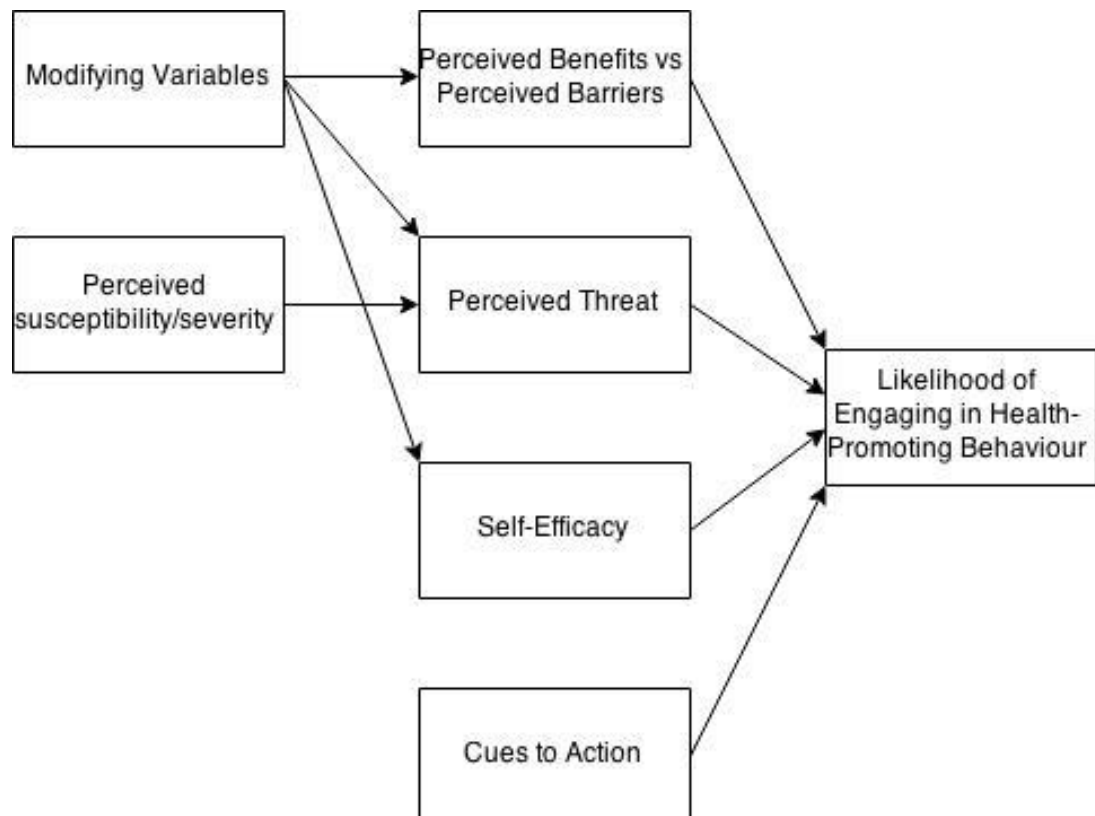


Figure 3.1. The Health Belief Model schematic

In a meta-analysis of the effectiveness of the Health Belief Model, Carpenter (2010) includes 18 studies with 2,702 subjects. The aim is to determine whether measures of health beliefs can longitudinally predict behaviour. Benefits and barriers are consistently the strongest predictors. The effect of perceived benefits and time two behaviour and the time between measurements is approximately $r = -.59$ suggesting the amount of time passing between time one and two strongly moderates the effect of time one benefit variable on time two behaviour estimates such that longer periods of time are associated with weaker effects. Barriers to performing the target behaviour have the largest effect sizes of the four HBM variables as it was above the estimated $r = .21$ but barriers are a weaker predictor of treatment outcomes than prevention behaviours. All the studies show severity, barriers and benefits are related in the predicted direction to the likelihood of performing the target behaviour. As the amount of time between measurement of the variable and the measurement of the behaviour increases, the chance of finding effects in the direction predicted decreases for susceptibility, severity and benefits, however, with barriers the relationship is almost nil. When considering treatment or prevention behaviour the size of the effects for barriers and benefits are stronger predictors when the outcome is preventing a negative health outcome compared with when it is treating an existing one. This moderator does not substantially affect the relationship between both severity and susceptibility and behaviour and when the behaviour is to take prescribed drugs, the effect sizes for severity and susceptibility are larger than studies that measured other behaviours. Some limitations of this meta-analysis include the small number of studies used, 18, but this is due to the lack of studies available. The studies used do lack variety and vary in quality with some using one-item measures and some using multiple item measures. This review does not test a more complex model because the studies included do not have full correlation matrices and it still shows the health belief model constructs vary in their effectiveness as predictors of behaviour. It is made clear that there are inconsistent effects and weaknesses in susceptibility and severity as predictors. Overall the HBM constructs vary in their effectiveness as predictors of behaviour and these inconsistencies highlight the need to examine possible mediations and moderations among the variables looking outside the standard four-variable additive model regularly used.

To focus in more detail on research of the HBM specific to alcohol a study by Bardsley and Beckman (1988) use the HBM to assess decision to enter treatment for alcoholism. The participants, consisting of 407 US adults with an equal split of gender either attending treatment for alcoholism or having alcohol abuse problems, complete personal interviews and a self-administered questionnaire. The HBM components are assessed alongside perceived treatment effectiveness, cues to action, background/demographic information and symptom severity. Perceived barriers to treatment, specifically cost of going into treatment is an important factor when seeking treatment and the HBM variable are able to classify between 80% and 86% of cases and explain from 32% to 51% of the variance in decisions to enter treatment for alcoholism. Perceived illness severity is the foremost characteristic differentiating both men and women in

treatment from those not in treatment. Cues to action is also consistently important with those in treatment reporting a major event encouraging them to go into treatment. A weakness of the study is that it is retrospective and vulnerable to criticism that participant's perceptions could have been altered through joining treatment but two factors are shown to imply that the belief in symptom severity preceded their entry into treatment and most likely influenced the decision. There is less support for the other components of HBM in this study but problem drinkers are more likely to enter treatment if they perceive their problems to be severe therefore outreach efforts could focus on drinkers' awareness of the symptom severity. The effectiveness of advertisements and education of the severity of symptoms of alcoholism is important as it is seen to increase entrance to treatment. The way these factors are implemented should be tailored to the patients' needs with heavy drinkers needing a more in depth intervention to increase their perceptions of their own problems with alcohol.

In summary, the Health Belief Model appears to offer an effective method of predicting participation in treatments such as rehabilitation or possibly in the case of alcohol, a reduction in consumption, but does not by its nature predict binge drinking. The HBM highlights inhibiting factors to behaviours such as perceived barriers to entering alcohol treatment like cost of treatment but this type of model is less appropriate for less severe behaviours that do not require treatments like binge drinking. Other theories that consider less specific behaviours such as the self-efficacy theory, theory of reasoned action and theory of planned behaviour, would be more useful in predicting an individual's decisions to binge drink.

3.2.2 Protection Motivation Theory

Protection motivation theory (Rogers, 1975) was developed to explain how people respond to fear-arousing health threat communications. Protection motivation refers to the motivation to protect oneself against a health threat and usually defined operationally as the intention to adopt the recommended action of protection. The four main determinants of intentions to adopt a health protective behaviour in this model are vulnerability, severity, response efficacy (belief that the recommended action is an effective method of threat reduction) and perceived self-efficacy (belief that one can perform the recommended action successfully)(Sutton, 2001). Therefore, a person should be more motivated to protect themselves and have stronger intentions to adopt the protective action in relation to the extent that they believe a threat is likely, that the consequences will be serious if the threat occurs, that the recommended action is effective in reducing the change or severity of the threat and that they are able to carry out the recommended action. This section discusses meta-analyses of the PMT and practical applications of the theory regarding risky drinking behaviours to gain an understanding of its strengths and weaknesses.

In a meta-analysis of research on the Protection Motivation Theory, Floyd, Prentice-Dunn, and Rogers (2000) carry out a literature search with the requirements the studies include an assessment of intention or actual behaviour and the intention or behaviour must be to prevent potentially

harmful consequences either by terminating an existing deleterious action (e.g. quit smoking), by maintaining a protective behaviour (e.g. continuing exercising) or by initiating a protective action (e.g. wearing sunscreen). The studies are classified and coded and independently judged on quality of methodology. Results are based on effect sizes and confidence intervals from each study. This meta-analysis contains 65 studies representing 29,650 individual participants and the 65 studies are divided into six main categories of subject matter: cancer prevention, exercise/diet/healthy lifestyle, smoking, AIDS prevention, alcohol consumption and adherence to medical-treatment regimens. The main theoretical implications are that protection motivation theory is shown to be a viable model on which to base individual and community interventions as it provides an understanding of why attitudes and behaviour can change when people are confronted with threats. The effect sizes for all of the model variables are significant and in the direction predicted indicating that changes in protective behaviours correspond with the psychosocial variables included in the model. It is explained that decisions to take protective actions is a positive function of severity because one must believe that there is some harm (e.g. liver failure for alcoholics) and that one is vulnerable to this harm while these considerations must also override the rewards and outweigh the costs. As the mean effect sizes demonstrate each component of PMT is linked to healthy outcomes, it is that to decide to carry out the recommended response, an individual must believe that performing the response will avoid the danger and that one has the ability and will to perform the response. This work is important to consider when discussing protection motivation theory as it shows each component of PMT proves to be significantly related to healthy attitudes and behaviour, helping to understand the relationships between the two offering that the model's components could be used to improve disease prevention and health promotion.

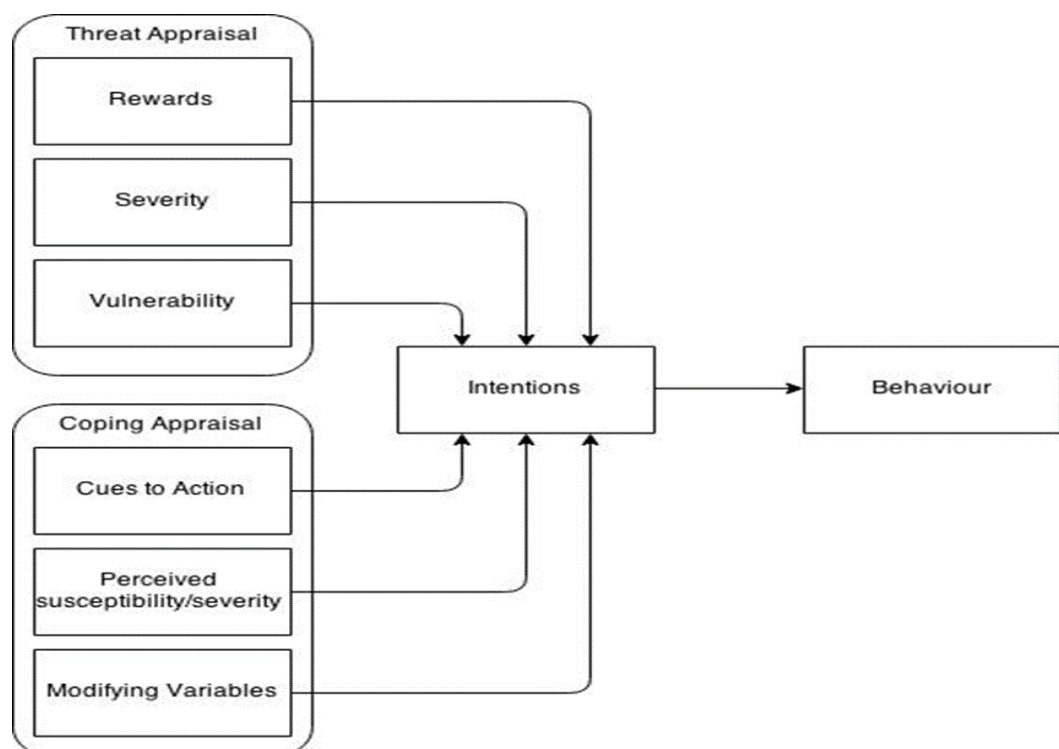


Figure 3.2. Schematic of the Protection Motivation Theory

Figure 3.2 was drawn from Sommestad, Karlzén, Hallberg, Furnell, and Furnell (2015) and shows a schematic of the Protection Motivation Theory with threat and coping appraisal components predicting intentions and intentions predicting behaviour.

In a second meta-analysis of protection motivation theory, Milne, Sheeran, and Orbell (2000) carry out a quantitative review of the PMT to assess its overall utility as a predictive model and to establish the variables which would be best for health-education interventions. They evaluate the success of PMT in the prediction of health-related intentions and behaviours more specifically. In explaining the modern application of the model, the authors state that PMT was originally developed as an extension of fear-appeal research but was adopted more generally as a model of decision making in relation to threats. The majority the threats are health-related threats with PMT being used to understand and predict protective health behaviours. The requirements for inclusion in this review are; the studies are an empirical application of protection motivation theory; there is a measure of behavioural intention, and concurrent or subsequent behaviour included in the analysis; the behaviour used in the study is a health related behaviour (e.g. breast self-examination, smoking cessation or adopting a healthy diet). 27 studies are included in the analysis with 29 independent samples and a total of 7,694 participants. Two main types of studies are explored: detection behaviours and prevention behaviours. Detection behaviours are those conducted to enable an individual to discover whether they have a specific condition that can be a threat to their health (e.g. mammography, pap test, testicular self-examination) and prevention behaviours are those that an individual adopts or ceases in the belief that doing so will reduce the risk of developing disease in the future (e.g. exercise, smoking cessation, sunscreen use). The studies are also categorised according to research design including, correlational design, health-education intervention and experimental manipulations of specific PMT variables. Of these, 15 involve correlational designs, 8 use specific experimental manipulations and 3 employ health education. Most studies use samples of high school, college or university students but some use general population samples. There is support for the threat and coping appraisal components in predicting health related intentions, though modest, while all threat and coping appraisal variables are significantly associated with intention. The PMT variables are all found to be significantly associated with concurrent behaviour with the association between intention and concurrent behaviour being the strongest. Intentions are also significantly associated with subsequent behaviour and have a medium-to-strong correlation as well showing a robust relationship.

The PMT importantly shows evidence that intention and behaviour support the model and predicts intention will be the best, and most immediate, predictor of behaviour. It also shows threat appraisal is a poor predictor of intention and behaviour. The review does show support for previous research but has difficulties with statistical interpretation and measurement which may be responsible for weak associations obtained between threat-appraisal components and intention and behaviour. This could be caused by the possibility of both positive and negative associations between risk and behaviour for example, if a person feels vulnerable to a health threat they may

chose so adopt a protective behaviour, a positive relationship will occur. In contrast, if the individual adopts the protective behaviour they may no longer feel vulnerable to the threat therefore the association between perceived vulnerability and behaviour will be negative. Another weakness is the cross-sectional nature of the studies, making it difficult to determine whether perceived-vulnerability beliefs influence behaviour or behaviour influences perceived-vulnerability. It is suggested PMT fails to produce consistent predictive associations especially for threat-appraisal variables though even with these weaknesses this analysis is important as it shows experimental PMT studies demonstrate information can be manipulated to successfully change beliefs implying future research could incorporate these methods into public health intervention programs.

In an application of the protection motivation theory to riskier single-occasion drinking, Murgraff, White, and Phillips (1999) examines the contribution of PMT cognitive mediating variables to the prediction of single-occasion drinking intentions and behaviour. This study defines risky single-occasion drinking by informing the participants the risk of harm increases at the levels of six units for women and eight units for men and measures this behaviour on weekends using 166 university students as the sample population. 74% of their sample are female and the mean age was 22 with a range of 18 to 46 years. Respondents completed 2 questionnaires two weeks apart including demographics information, previous weekend drinking, threat appraisal, coping appraisal, intention, and self-reported drinking behaviour at two week follow-up.

PMT components predict a substantial proportion of behavioural intentions to drink at safer limits on single drinking occasions but no support is found for PMT as a model of health behaviour. The variables in the theory account for 31% of the variance on intentions for future single occasion drinking extending the range of health behaviours in which PMT may be applied. Intentions for the riskiness of future single occasion drinking does relate to cognitive components identified by the theory as well as some support for the associations between threat appraisal (severity, vulnerability and rewards) and intentions with severity having the only significant effect. Severity as a threat appraisal may be important as a more distal antecedent of intention so that when it is made more salient it is more effective. Perceived self-efficacy plays a role in intention formation. The key result in this research is that intention formed do correlate with later behaviour but when previous drinking is also considered as a predictor for future behaviour the association with intentions disappears and the PMT variables are not significant in predicting future behaviour. This shows intentions formed on the basis of new threats contributing to behaviour change is unlikely but considering manipulating social norms can be an effective tool in reducing alcohol misuse and alcohol related harm. As this measure of intention is a particular weakness of the study, it could be that a more specified measure could have separated riskier and non-riskier drinkers.

It is sometimes the case that intentions can be disregarded when explaining health behaviours especially considering substance use. Though an individual may be fully aware of the dangers of

alcohol use to themselves and others, their difficulty in controlling urges to use or abuse can take over and render their intentions useless. Ostafin, Marlatt, and Greenwald (2008) examined how the depletion of self-control resources would influence the ability to control alcohol use and how the use of an implicit measure of alcohol motivation can predict self-control failure. Eighty-seven participants with a mean age of 27, primarily male, complete a measure of automatic alcohol motivation (IAT) with half then completing tasks designed to deplete their self-control resources. Other measures include typical drinking behaviour, urge rating, explicit alcohol motivation, taste test (ratings on brands), hedonistic response to alcohol, affect state and manipulation checks. When at risk drinkers experience a conflict between desire to consume and to restrain consumption, they are likely to drink more when their self-control resources are depleted and that when self-control resources are depleted only implicit measures of alcohol motivation are more strongly related to consumption despite intentions to restrain. Overall, loss of self-control of alcohol use is a function of self-control resources and of spontaneous motivational responses to alcohol. A possible explanation for this is a rebound effect meaning the suppression of a thought leads to an increase of that thought once efforts to suppress it are relaxed. This research is important as it contributes to the understanding of a loss of control as it occurs in alcohol consumption, specifically the results indicate that a loss of control of alcohol use was a function of both self-control resources and of automatic appetitive responses to alcohol.

3.2.2.1 Summary of the protection motivation theory

The reviewed meta-analysis, articles and other research indicate that motivation may play an important role in predicting binge drinking behaviours while also highlighting that intentions is also a major factor to consider. The Protection Motivation Theory contributes to the understanding of decisions to binge drink and each of the main PMT variables can be effective as predictors of intentions and/or behaviour. Importantly, self-efficacy has the strongest, most consistent effects showing individuals may want to carry out the protective behaviour but having the ability and access to do so is key. The self-efficacy theory is discussed in the following section to further discover how the belief that one can successfully perform the behaviour plays a role in determining behaviour.

3.2.3 Self-Efficacy Theory

The self-efficacy theory or SET is a part of Bandura's (1986) social cognitive theory and this approach states that there are two key determinants of behaviour. The first is self-efficacy and the second outcome expectancies which refers to the perceived positive and negative consequences of performing a behaviour. These are determined by past experiences of the behaviour, vicarious experiences (or modelling through others' experiences), encouragement from others and the physiological and emotional states of the individual. The schematic in Figure 3.3 below is drawn from Gist and Mitchell (1992) and shows the components of the SET with past experiences, vicarious experience, encouragement and physiological and emotional states predicting efficacy

expectations. In turn, efficacy expectations predict behaviour. The following section will discuss the foundational research of the SET to gain an understanding of how the belief that one can successfully perform a behaviour plays a role in determining that behaviour.

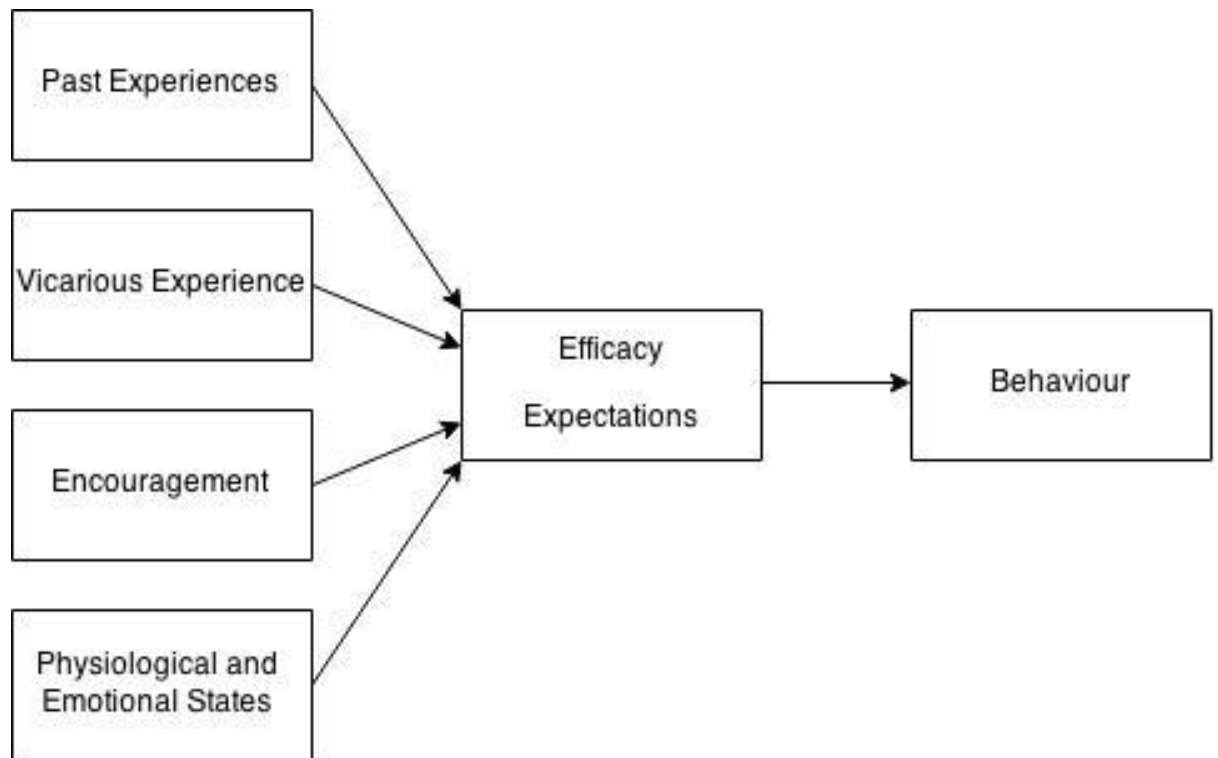


Figure 3.3. Schematic of the Self-Efficacy Theory

In an analysis of self-efficacy theory of behavioural change, Bandura and Adams (1977) report the findings of two experimental tests investigating the hypothesis that systematic desensitization effects would change in avoidance behaviours by creating and strengthening expectations of personal efficacy. In the first study, the subjects consist of snake phobic female participants ranging in age from 19 to 57 years of age. Changes in expectation of personal effectiveness and avoidance behaviour, fear arousal accompanying approach responses, efficacy expectancies and situational generalisation of fear and self-efficacy are measured. A systematic desensitisation on the participants as well as post treatment and supplementary treatment measures is carried out. For the second study 6 of the snake phobic participants recruited previously are exposed to a sequential micro analytic procedure, progressive exposure to a living snake. The results from the two studies lend substantial validity to the theory that psychological influences alter defensive behaviour and enhances the level and strength of perceived self-efficacy by providing a common theoretical framework for explaining and predicting behavioural change accompanying diverse modes of treatment. Therefore, efficacy expectations predict with accuracy the level of performance regardless of whether self-efficacy is changed through enactive mastery, vicarious experience or extinction of anxiety arousal by systematic desensitisation. They also show a number of factors including appraisal of the sources of arousal, the situational circumstances in which arousal is elicited and past experiences affect performances on the cognitive processing of emotional

reactivity. Another aspect of theory related to the multiple determination of self-efficacy states that any single source of efficacy information will somewhat depend on the total configuration of efficacy experiences. In those who have occasional performance successes, extinguishing fear arousal to threats will raise efficacy expectations compared to those consistently failing in coping attempts. Overall, the role of cognitive self-efficacy in mediating fear reduction is supported. Some weaknesses of the Bandura and Adams (1977) studies include self-report of the behaviour, focus on such a specific behaviour, and lack of comparison to other behavioural change methods. There is also a lack of self-efficacy and alcohol related behaviours. This research is dated and could have been improved but is important as it offers a classic example of using cognitive contributions like self-efficacy as a method for behavioural change that could possibly be applied to other behaviours. A more inclusive model of behaviour explanation taking into account self-efficacy and other components of social cognition models such as norms, attitudes and intentions will be better at explaining binge drinking behaviour. The theory of reasoned action and the theory of planned behaviour are more inclusive models and are discussed in the following section.

3.2.4 The Theory of Reasoned Action and the Theory of Planned Behaviour

The theory of reasoned action (Fishbein & Ajzen, 1975) was developed through social psychological research on attitudes and the attitude-behaviour relationship with the model assuming that many behaviours of social relevance are under volitional control. Intentions to perform a behaviour should be the immediate determinant and the single best predictor of the behaviour and in turn is considered to be a function of two basic determinants. These are attitude towards the behaviour (the individual's overall evaluation of performing the behaviour) and subjective norms which is the perceived expectations of significant others with regard to performing the behaviour. Therefore, an individual should have stronger intentions to perform a behaviour if they evaluate it in a positive way and if they believe that significant others think they should perform it though the relative importance of the two factors vary across behaviours and populations (Sutton, 2001). Often, the attitudes reflect the individual's behavioural beliefs in regards to the possible consequences, for example, a belief that performing a particular behaviour could lead to a positive experience suggests positive attitudes will be held toward that behaviour. Similarly, subjective norms is considered a function of beliefs about other's thoughts about whether or not they should perform the behaviour therefore if an individual believes a significant other thinks he or she should perform the behaviour the individual will perceive social pressure to carry out the behaviour. Specifically, the subjective norms measure is a function of the person's salient normative beliefs with respect to each significant other, each weighted by their motivation to comply with that referent (Sutton, 2001). Figure 3.4 below is adopted from Fishbein and Ajzen (1975) and shows the Theory of Reasoned Action (TRA) with beliefs and evaluations predicting attitude toward behaviour, normative beliefs and motivation to comply predicting subjective norms. Attitude and subjective norms then predict intentions and intentions predict behaviour.

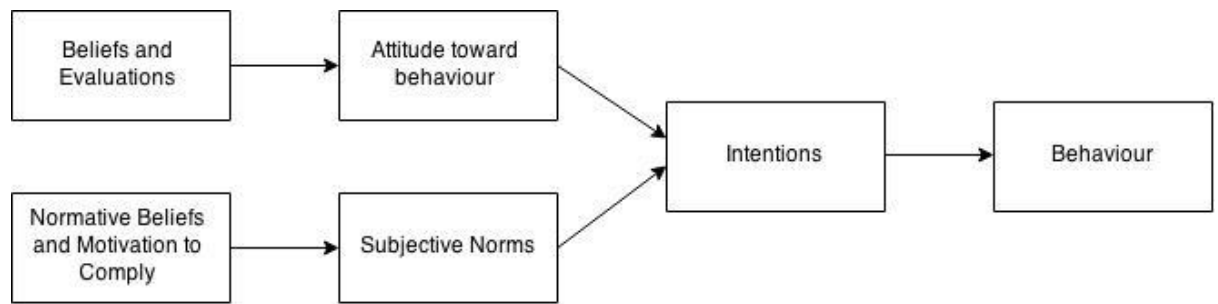


Figure 3.4. Schematic of the Theory of Reasoned Action

The Theory of Planned Behaviour (Beck & Ajzen, 1991) builds on the TRA, extending it to include behaviours that are not entirely under volitional control such as giving up smoking so to accommodate these behaviours perceived behavioural control (PBC) was added. PBC can be explained as the perceived ease or difficulty of performing a behaviour and reflects past experiences as well as anticipated obstacles. The TPB is considered to be a deliberative processing model in that it appears to imply that individuals make behavioural decisions based on a careful consideration of available information (Ajzen, 2002b; Conner & Norman, 1995). According to this model, the primary determinants of future behaviour are one's intentions to perform behaviours (e.g. 'I intend to engage in a binge drinking session in the next week') and the subjective perception of having control over behaviour (Cooke, Sniehotta, & SchÜz, 2007). In turn, intentions are predicted by three variables; attitudes are a person's positive or negative evaluations of performing the focal behaviour (e.g. 'For me to engage in a binge drinking session in the next week would be...' unenjoyable - enjoyable), subjective norms are a person's perception of other people's opinion regarding behavioural performance (e.g. 'Most people who are important to me think that I should engage in a binge drinking session in the next week') and PBC refers to a person's sense of control over performing the behaviour under study (e.g. 'I am confident that I can engage in a binge drinking session in the next week')(Cooke et al., 2007).

An empirical study employing the TPB to investigate the factors underlying intention to use alcohol and tobacco, McMillan and Conner (2003b) suggests that the control component would predict both behavioural intention and where the individual is correct in perceiving that they had high levels of control over the behaviour, it will predict behaviour. Also, the theory postulates attitudes will be predicted by the summed product of behavioural beliefs and outcome evaluations, where behavioural beliefs are a person's beliefs about the likelihood of salient outcomes from performing a behaviour and outcome evaluations are assessments of whether these outcomes will be positive or negative. The summed product of normative beliefs will predict the subjective norms component and motivation to comply is whether or not a person feels that they should do what the various referent groups think that they should. PBC is based upon an evaluation of the power of factors to facilitate or inhibit the performance of the behaviour each weighted by their frequency of occurrence. The TPB has been applied to the prediction of many health behaviours and behavioural intention is normally well predicted by the three components (mean $R^2 = 0.39$),

while behaviour is well predicted by PBC and intention ($R^2 = 0.27$). Subjective norm and PBC account for an average of 41% of the variance in intentions to drink alcohol. However, intentions and PBC account for an average of 28% of the variance in drinking alcohol. TPB is open to further expansion, if further predictors can be identified, and this has led to the consideration of a number of additional predictors within the context of the TPB. Figure 3.5 below shows the schematic built from Beck and Ajzen (1991) with the determinants of behaviour according to the TPB.

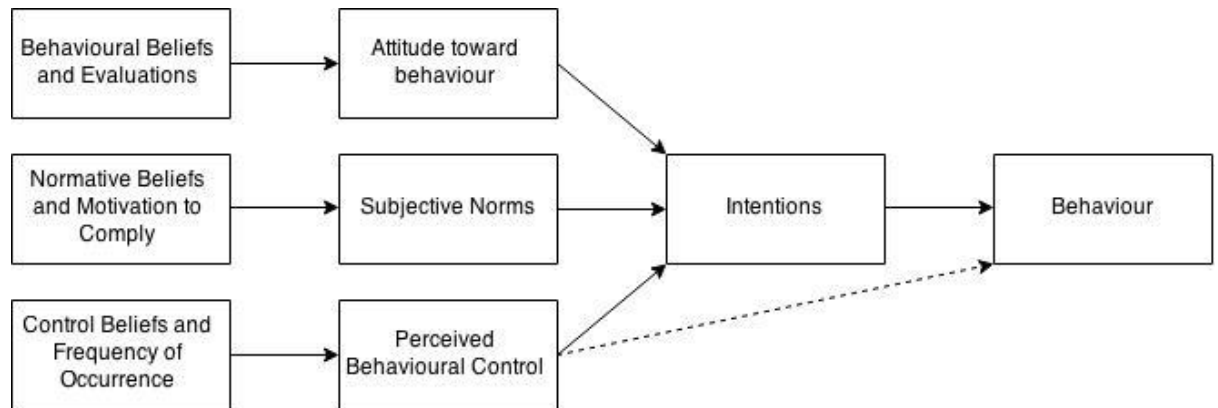


Figure 3.5. Schematic of the Theory of Planned Behaviour

When intention is predicted from attitude, subjective norm and perceived behavioural control between 40 and 50 percent of the variance is explained and if behaviour is predicted from intention alone or from intention and perceived behavioural control, between 19 and 38 percent of the variance can be explained (Sutton, 2001). A more detailed discussion of the TPB and additions to the model follows in Chapter 4.

3.2.5 Comparison of social cognition models

In comparing the social cognitive models, it is important to consider their similarities and their differences while also assessing their ability to predict behaviour. Some similarities that arise include the health belief model and protection motivation theory both share the constructs of perceived susceptibility and vulnerability. It should also be noted that other models share very similar constructs such as perceived behavioural control and self-efficacy. All of the models also assume that an individual is conscious of their choice to perform the behaviour weighing up the positive and negatives of carrying out the behaviour while also including to varying extents the expectancy-value principle derived from the classical expected utility model (a normative model of decision making). This section of the review discusses the aforementioned social cognition models through review articles to establish why using the theory of planned behaviour should be the most useful model in predicting binge drinking behaviour compared to the other models.

A review and comparison of health behaviour psychosocial theories by Sutton (2001) discusses the principle that expectancies (subjective probabilities) and values are important determinants of behaviour and in their strongest form are combined multiplicatively or at least individuals behave

as though they combine their cognitions in this way. The argument that social cognitive models are often criticised for failing to consider decision making may not always be rational. Of course some behaviours by nature require more thought but some may require rapid decisions based on immediate considerations. It does seem that each behaviour would vary in its fit to each model and predictive variables. Social cognition models are also criticised for being static but defended by stating they summarise dynamic causal processes. For example, in the theory of reasoned action the changes in behavioural beliefs and/or outcome evaluations are assumed to produce changes in attitude leading to changes in intention which ultimately produce changes in behaviour. The social cognition models are also shown to differ in their degree to which they specify the content of the cognitions they identify, for example, with the TRA stating once the behaviour of interest has been defined, it is possible to generate questionnaire items for intention and for the direct measures of attitude and subjective norms. However, it is recommended in order to generate the items for behavioural beliefs, outcome evaluations, normative beliefs and motivations to comply, information should be gathered on salient beliefs from the sample. Overall, the focus is on the intention-behaviour gap, considering attitudes being activated automatically and models of self-regulation. Many new models are being developed to account for others that may be lacking an explanatory variable but moving forward research would benefit from more precise definitions of concepts, greater standardisation of measures, more tests of convergent and discriminant validity, more focus on smaller number of models and more empirical comparisons of the available models.

To highlight support for the TPB, a structured review of social cognition models and health behaviour by Armitage and Conner (2000) distinguishes between motivational, social cognition and multi-stage models of health behaviour while comparing and discussing common themes that appear within the categories. Motivational models are defined as focusing on the motivational factors (e.g. protection motivation or threat) that underpin decisions to perform or not to perform health behaviours; social cognition models as focusing on action control strategies that are designed to ensure motivation will be translated into action; and multi-stage models as delineating processes which both facilitate behavioural inaction and provide maintenance strategies. Motivational models include the HBM, PMT, Social Cognitive Theory, TRA and TPB. In regards to behavioural prediction, the TPB provides an improvement on the HBM, SCT and PMT and shows that it is a superior predictor of intentions and behaviour. There are concerns that the apparent superiority of the TPB could be due to better definition of the constructs. The given level of overlap between the models and findings that support expansion of the TPB could be due to the models being rooted in subjective expected utility and expectancy-value theories and the inclusion of measures of perceived control and intentions. Social cognition models and multi-stage models could be better methods of explaining behaviour in such cases. Though there are some concerns about the gap between intentions and behaviour, motivational models of health behaviour have been shown to be useful predictors of health-related behaviour.

Further integral information with more focus on the TPB is provided in a second literature review by Ogden (2003) which takes a critical approach when analysing empirical papers published between 1997 and 2001 using social cognition models. This review considers 47 (33 of which used TPB) articles published testing or applying one or more social cognition models including theory of reasoned action, theory of planned behaviour, health belief model and protection motivation theory. The papers are chosen from reputable journals used by researchers of health psychology work in the US, the UK and across other European countries and scrutinised for their pragmatic and conceptual basis. One of the papers included binge drinking behaviour and a few included other risky health behaviours such as smoking and ecstasy use. The social cognition models appear useful and are used to inform service development and the development of health related interventions to promote health behaviours. It is common for at least one variable in a model not to predict the outcome variable and with the TPB specifically the subjective norms often plays no role while perceived behaviour control can appear as weak as well. It is also common that much of the variance is left unexplained by the models. Some explanations offered for lack of explained variance include incorrectly operationalised variables, the assessment of a novel health behaviour and sample characteristics. Overall, the models were not strongly supported in terms of the expected associations between variables or in terms of their ability to predict the behaviour. The use of questionnaires with the intention to measure an individual's cognitions may actually change rather than access the way a person thinks. It may be that question asking brought about change with it being descriptive and passive at times and interventional and active at others. There is concern models are not rejected but instead explanation are offered functioning as caveats to allow the model to be verified. Overall, after considering some flaws in the conceptual basis, the social cognition models do appear useful and fruitful while providing a framework for the development of interventions designed to change health-related behaviours.

3.2.6 Summary of psychosocial theories of drinking

Unlike most of the other psychosocial theories, the theory of reasoned action and the theory of planned behaviour have shown relatively high degrees of standardisation of measures based on published recommendation (Ajzen, 2011; Ajzen & Fishbein, 1980) and the principle of correspondence and compatibility is emphasized stating the maximum prediction of the measures for all of the components of the model should use comparable wording. Also, the TRA, SET and TPB do not consider health behaviours to differ from most other of behaviours in that they share the same proximal determinants. This is in contrast to the HBM and PMT as they include perceived susceptibility and perceived severity in regard to a health threat which keeps these theories from being applied more broadly to non-health related events. The TPB seems to encompass many of the other theories' consideration with the TRA variables and a measure of control over behaviour (self-efficacy) covered and intentions predicting behaviour. The TPB has greater predictive utility than the HBM on some health behaviours (Lajunen & Räsänen, 2004). The role of parents and peers in teenager's intentions is also important and the TPB appears to be the best model to predict

health behaviours and has been well established with alcohol and binge drinking (Ajzen, 2011; Armitage & Conner, 2001; Cooke et al., 2007; Hardeman et al., 2002; K. Johnston & White, 2003; Manning, 2009; McMillan & Conner, 2003b; Norman & Conner, 2006) therefore further analysis of the TPB is discussed in the following chapter.

4 Chapter 4: The theory of planned behaviour

4.1 Assessing the TPB

As the theory of planned behaviour has been an important social psychological model used to explain many health behaviours, it could be the best for explaining decisions to binge drinking. The following section will assess the literature in regards to the explanatory ability of the TPB and young people's decisions to binge drink. To start, evidence through representative articles using the TPB will be discussed. This will be followed by review articles detailing the robustness of the theory alongside arguments highlighting some weaknesses. Overall, this will show further support for the TPB as the best fit for gaining an understanding of young peoples' binge drinking behaviour.

4.1.1 Empirical Support for the TPB

An international article using an expanded TPB model by Williams and Hine (2002) looks at parental behaviour and alcohol misuse among adolescents. The research is carried out in two rural North Queensland (Australia) secondary schools. They employ path analysis to investigate the possible effects of three parenting variables (fathers' alcohol consumption, mothers' alcohol consumption and permissive parenting) on adolescent problem drinking, determine whether these relationships are mediated by three variables central to Ajzen's theory of planned behaviour and test whether mediational pathways through the TPB variables are similar for both male and female adolescents. This study is important because it shows if there are differences in gender as the sample pool to draw from at UEA has a majority of female participants. Questionnaires are used to assess a range of variables related to parenting, TPB, alcohol consumption, and demographics. Alcohol misuse, frequency of consumptions and quantity of alcohol consumed is measured. Attitudes are measured by ratings where the participants are asked to indicate how they feel about drinking alcohol on bipolar dimension (bad/good, unpleasant/pleasant, foolish/wise and harmful/beneficial). To assess subjective norms the participants are asked to rate the extent to which their father, mother, brothers, sisters, best friend and five closest friends approve of their drinking alcohol. They also rate the importance they place on the opinions of each of these significant others. Items addressing the respondents' ability to resist peer pressure to consume alcohol assess perceived behavioural control. The father and mother's alcohol use are measured and permissive parenting is assessed by items that ask participants to indicate how often their parents allow them to go out whenever or wherever they want, let them get away without doing work they are told to do, let them off easy when they do something wrong, let them spend money they earn on whatever they wish and insist on knowing what they are doing when they go out. Males are found to report drinking more than they planned during the previous month significantly more frequently than females. The participants consume alcohol between two and three times per month and get very drunk about once per month. There are correlations between all three parent variables and alcohol misuse in the adolescent sample. Some of the findings suggest that gender

does not moderate the mediational paths specified by the model. Participants whose fathers and mothers (or both) consume more alcohol exhibit more positive attitudes toward alcohol consumption, expect more positive social reinforcement for drinking from significant others and report weaker control over their drinking. Higher levels of reported permissive parenting are also associated with positive attitudes toward alcohol consumption and higher levels of anticipated social reinforcement for drinking, but are unrelated to perceived behavioural control. Participants that hold more positive attitudes toward alcohol consumption expect to be socially reinforced for consuming alcohol, feel they have little control over their drinking and have significantly higher alcohol misuse scores. One weakness of this research includes the geographically restricted sample making it harder to generalise the results to other populations and cultures. Completing this study in several other countries or even different areas of the country would improve the experiment. It could have been interesting to sample university age students to add more depth to the study but this article does offer important findings related to gender differences, parenting and alcohol use in adolescents.

Empirical research specifically focused on the theory of planned behaviour by Norman and Conner (2006) consider the utility of the theory as a framework for predicting binge drinking among young people. They also look at the addition of past behaviour as being moderated by the theory. They predict that the TPB will be predictive of binge drinking intentions and behaviour and that the addition of past behaviour will increase the amounts of variance explained. They also hypothesise that the frequency of past binge drinking will moderate TPB-intentions and intention-behaviour relations. The participants consist of undergraduate psychology students completing TPB questionnaires in relation to binge drinking. After a week, the previous participants fill out a second questionnaire on their binge drinking behaviour. The follow up questionnaires are obtained for participants who have previously completed the first questionnaire (68.6% response rate). Comparing the responses of the group completing both questionnaires 1 and 2 to those only completing the time 1 questionnaire, no significant differences exist between the two groups on any of the TPB or binge drinking measures. The time one questionnaire measures the main constructs of the TPB on 7-point response scales and is coded so that high values indicate high levels on the variable of interest. Frequency of drinking is also measured in the first questionnaire. 'Binge drinking' is defined in both questionnaires as consuming at least five pints of beer (or 10 shorts/glasses of wine) in a single session for males. For women, it is defined as having at least three and a half pints of beer (or seven shorts/glasses of wine) in a single session. Attitude, subjective norms, self-efficacy, perceived behavioural control (PBC) and behavioural intentions are all assessed using appropriate items and past binge drinking is assessed with the respondents indicating on average how often they engage in a binge drinking session. Participants report engaging in binge drinking on average 1.51 times per week and 66.7% engage in binge drinking sessions during the one-week follow-up period. Intentions to engage in binge drinking are correlated with each of the TPB constructs so that strong intentions are associated with positive

attitudes, strong feelings of self-efficacy, and strong perceptions of social pressure and weak perceptions of control. Intentions are also positively correlated with past binge drinking and negatively associated with age. The time two measures re correlated with all of the theory of planned behaviour constructs except PBC. It is also positively correlated with past binge drinking and negatively correlated with age. Eight percent of the variance in binge drinking intentions is explained by age and gender. Past behaviour moderates the impact of the TPB variables on intention and attitude is a significant predictor of intention at all three levels of past behaviour. Also, intentions are a significant predictor of binge drinking behaviour under moderate ($B = .06$, $p < .01$) and low ($B = .01$, $p < .001$) levels of past behaviour but as frequency of past behaviour increases the predictive power of intention decreases and becomes non-significant under high levels of past behaviour ($B = .003$, ns). Attitudes are highlighted as a target for changing binge-drinking behaviours in young people. A program to initiate a change in the attitudes of young people could help reduce the behaviour as well as the risks associated with this behaviour. A decrease in positive attitudes towards binge drinking in theory should decrease intentions to binge drink, which in turn could decrease the occurrence of risky single occasion drinking.

In a review article on the importance of subjective norms for people who care what others think of them, Latimer and Martin Ginis (2005) used the framework of the TPB to examine whether the extent to which people are concerned with others' approval of them moderates the subjective norms – intentions relationship in the context of exercise. Their findings supported the notion that the subjective norms-intentions relationship was moderated by individual differences (Trafimow & Finlay, 1996).

Offering a more in depth meta-analysis of the TPB, Armitage and Conner (2001) seek to overcome some of the methodological weaknesses of previous meta-analyses and to focus on several of the issues in TPB research. Support is provided for the efficacy of the TPB as a predictor of intentions and behaviour although prediction is superior for self-reported compared to observed behaviour with the TPB still capable of explaining 20% of the variance in prospective measures of behaviour. The theoretical debate surrounding the model is expanded by showing that PBC independently predicts intentions and behaviour in a wide number of domains and measures of intentions, self-prediction and desires possess discriminant validity (though only relatively weak evidence for the proposed self-efficacy –perceived control over behaviour distinction). Work on additional normative variables such as moral or descriptive norms may increase the predictive power of the normative component of the model.

A more current analysis by Cooke, Dahdah, Norman, and French (2014) aims to quantify correlations between TPB variables and intentions to consume alcohol and alcohol consumption in a systematic review and meta-analysis. This meta-analysis uses 40 studies and looks at pattern of consumption, gender of participants and age of participants as moderators. Overall the meta-analysis supports the utility of the TPB when applied to alcohol consumption intentions and

behaviour. Medium to large effect sizes are found but not throughout all of the TPB relationships. Alcohol consumption intentions show strong correlations for attitude and subjective norms and medium correlations for PBC. Additionally, self-efficacy has strong correlations with intentions whereas perceived control has a small negative and non-significant correlation. When considering alcohol consumption behaviour, intentions shows a strong correlation with behaviour but the correlation for PBC are small, negative and non-significant. Attitude appears as having the strongest relationship with intentions and intentions have the strongest relationship with behaviour. In regards to the moderators, pattern of consumption and age and gender of sample moderates some relationship with studies that use precise definitions of alcohol consumption (e.g. where participants are asked to respond in relation to drinking more than a specified number of units of alcohol on a single occasion) report stronger TPB relationship than studies using vague definitions. Females also seem to have larger attitude-intentions relationships than males and adults have stronger attitude-intentions relationships than adolescents. Suggestion for future meta-analysis would be to compare studies with more similar samples to draw stronger conclusions, include more studies in analysis and carry out more studies assessing binge drinking on multiple occasions. This meta-analysis highlights the increase in research testing the TPB as a model of alcohol consumption intentions and behaviour and shows past reviews of the TPB have combined studies on alcohol consumption with other substance-use behaviour. There is also a discussion of the negative relations between PBC and behaviour in alcohol consumption. In conclusion there is support for the utility of the TPB applied to alcohol consumption and intentions and interventions to reduce alcohol consumption should target attitudes, subjective norms and self-efficacy as methods of altering intentions and ultimately to reduce alcohol consumption rates.

4.1.2 Criticisms of the TPB

There are critics of the theory of planned behaviour and this section reviews criticisms of the TPB. Some common critiques include suggestions that people do not always base their decisions on careful deliberate analyses and rational reasoning (Sheeran, Gollwitzer, & Bargh, 2013); other variables not included in the TPB have direct effects on intention and behaviour and should be included (Ajzen, 2014); that consciousness as a causal agent is not important (Wegner & Wheatley, 1999); that the TPB does not contribute to the development of knowledge or help develop useful interventions for behaviour change (Sniehotta, Pesseau, & Araújo-Soares, 2014); and human social behaviour was driven by implicit attitudes (Greenwald & Banaji, 1995). The issues are addressed and their implications for the subsequent research discussed further in this section.

Not all researchers have been supportive of the TPB and a few offer some strong criticisms (Sniehotta et al., 2014). The theory has been castigated for its exclusive focus on rational reasoning, excluding unconscious influences on behaviour and the role of emotions beyond anticipated affective outcomes. The static explanatory nature of the TPB has not helped to gain an

understanding of the evidenced effects of behaviour on cognitions and future behaviour. Others also question whether the hypotheses derived from the model are open to empirical falsification or whether they are essentially obvious statements which cannot be falsified (Ogden, 2003). Some reviews show the majority of variability in observed behaviour is not accounted for by measures of the TPB with the particular problem of 'inclined abstainers', or individuals forming intentions and then failing to act, being a recognised limitation that remains unaddressed by the theory. The overall focus of criticism from the article is the limited predictive validity of the TPB with it not explaining sufficient variability in behaviour. Extending the TPB model does a disservice to the novel ideas that such extensions test and provide unnecessary support to a model that in aggregate has been expanded beyond recognition. One possible solution is to retire the TPB altogether and consider action theories which do not make extensive assumptions about cognitions or lend themselves to experimental tests (Sniehotta et al., 2014). Theories emphasising temporal dynamics and temporal frames adopted by individuals when considering benefits and costs of behaviour options could offer a solution or by possibly including multiple goals and behaviours in theory or integrating evidence obtained from a range of theoretical approaches. Though some opposition to carrying on using the TPB model shows support for their position, the arguments appear brief and lack substantial evidence to support their claim when there has been much more research to show the TPB has been effective.

In defence of the TPB in response to a critical editorial by Sniehotta et al. (2014) were Conner (2014) and Ajzen (2014). Ajzen (2014) argues the editorial fails to make a case for retiring the TPB and displays a profound misunderstanding of the theory itself. They insist the critics fail to appreciate the work needed to properly apply the theory in efforts to change behaviour and misinterpret negative findings of poorly conducted research as evidence against the theory. Conner (2014) details a few specific reasons the TPB is still a valid theory. The TPB is capable of being used to change behaviour through correlational studies to identify the key determinants of intentions and action for a behaviour, allowing targeted interventions of the determinants. It is also noted that perfect correspondence regarding predictive power of the TPB variables is unlikely due to factors that can intervene between forming an intention and acting. A broad range of other variables, such as weather, are likely to explain unique additional amounts of variance in behaviour. If the behaviour involves being outdoors and it rains unexpectedly, intentions will be less predictive as weather intervened. This rebuttal charges that proposed new theories Sniehotta et al. (2014) suggested as replacements for the TPB are unlikely to exceed the predictive power of the TPB across such a broad range of behaviours. Expansions to the TPB are beneficial due to their ability to account for more variance when explaining varied behaviours that may be influenced by unique variables. Ajzen (2011) also offers a robust defence of the TPB explaining that variables and processes such as willingness to perform a behaviour or social support that appear to go beyond the TPB can actually be accommodated within it where others such as habit formation and various background factors could expand and enrich our understanding of human

social behaviour. The TPB has been proven as an effective model for the prediction of human social behaviour and additional variables unique and relevant to binge drinking will be explored through expanding the TPB. A discussion of research expanding the TPB is discussed in the following section.

4.2 An Expanded TPB

Taking into account the range of findings previously discussed particularly in reference to criticisms of the TPB it is important to explore additions that may explain additional variable above and beyond the traditional TPB variables. Despite the success the TPB has had in predicting adolescent alcohol consumption, researchers criticise the theory for being incomplete. A common criticism is that the TPB focuses exclusively on the immediate cognitive determinants of behaviour, while ignoring more distal social, cultural and intrapersonal causes (Williams & Hine, 2002). According to the TPB, the key to understanding behaviour lies in a small set of variables (i.e. attitudes, subjective norms, and PBC), but the theory fails to explain why some adolescents hold beliefs that encourage alcohol consumption and others do not (Williams & Hine, 2002). Many suggest that a more complete account would require researchers to integrate the TPB variables with other variables (Ajzen, 2011; Churchill, Jessop, & Sparks, 2008; Ravis & Sheeran, 2003; Williams & Hine, 2002). Explanatory variables have been excluded such as a lack of consideration of automaticity or impulsivity therefore the following section will sum up and discuss information about the TPB and additions to the model including habit, impulsivity, descriptive norms and Social Identity Theory (Tajfel & Turner, 1979).

4.2.1 Habit as an additional construct in the TPB

A majority of our everyday behaviours are recurrent or variants of behaviours we have previously executed therefore looking at habit as one aspect of expanding the TPB can be useful (Myrbakk, 2005). The repetitive aspects of behaviours receive minimal attention in social psychology and in decision-making areas. It seems that repetition of choices has almost been neglected or has been studied in specific contexts such as decision-making by experts such as nurses (Ouellette & Wood, 1998). Given the prevalence of repeated over new behaviour there is reason to look more systematically to constructs like past behaviour, repetitive choices, experience, routines and habit (Myrbakk, 2005). Most popular social cognition theories postulate that intention or a conscious goal is the defining proximal antecedent of an enacted behaviour (de Bruijn & Rhodes, 2011). Models such as the TPB and social cognitive theory are applied regularly to understand physical activity (de Bruijn & Rhodes, 2011) and binge-drinking behaviours. There is a premise that some behavioural action becomes automatized and that habit provides an independent role in explaining behaviour from intention and interacts with the intention-behaviour relationship (Triandis, 1977). Therefore, the basic premise of theory behind a habit construct is that practiced behaviours that become efficient to perform and are likely to be highly reinforcing eventually side-step motivation and are performed from external cues to action (de Bruijn & Rhodes, 2011). The construct is in

partial connection with implementation intentions so that external cues to action are used to tie intention and behaviour together. Indeed, implementation intentions have been likened to creating habits through a volitional planning exercise (de Bruijn & Rhodes, 2011; Gollwitzer & Sheeran, 2006). Though most previous tests of habit use a measure of past behaviour (de Bruijn, Kroeze, Oenema, & Brug, 2008; de Bruijn & Rhodes, 2011) the need has arisen more recently for the use of a measure such as the SRHI. There has been little to no research linking habit measures and the TPB to binge drinking behaviours. The automaticity may have a role in the complex act of binge drinking as some results have been found in circumstances such as physical activity and foods consumption. Habit will be detailed in the upcoming chapter (section 5.2.1) as part of the first empirical study of the thesis.

4.2.2 **Impulsivity as an additional construct in the TPB**

Another important element of risky drinking behaviour to consider is impulsivity. Regarding this construct, there has been little attention paid to individual differences in personality within the theoretical framework of the TPB (Churchill et al., 2008). There is little doubt that the personality trait of impulsivity is involved in the etiology of substance use, misuse and disorders (Gullo, Ward, Dawe, Powell, & Jackson, 2011). Impulsive personality has been measured through a few different methods, namely with the Barratt Impulsiveness Scale 11 (BIS-11) associated with student drinking used in Carlson and Johnson (2012); impulsivity as part of the five factor model in Whiteside and Lynam (2001); impulsivity as measured through Cloninger's Tridimensional Theory of Personality in Nixon and Parsons (1989); and Churchill et al. (2008) use the UPPS scale to test if impulsivity contributed to the predictive utility of the TPB. Though impulsivity is discussed in detail in the next chapter, it is important to point out here that there is support for considering impulsivity as an addition to the TPB and exploring further the relationship impulsivity has with TPB components.

4.2.3 **Other constructs as additions to the TPB**

There are a number of additional constructs to consider assessing as part of behavioural predictions. Among other additions like moral obligations (Beck & Ajzen, 1991), belief salience (Pligt & De Vries, 1998) and reactance (Orbell & Hagger, 2006), there have also been ample evidence for additions to the TPB such as descriptive norms, defined as what significant others do themselves regarding the behaviour (Larimer, Turner, Mallett, & Geisner, 2004; Rivas & Sheeran, 2003). Descriptive norms are enlisted to address the comparative weakness of the subjective norm-intention relation and this correlation is significantly weaker than the attitude-intention and perceived behavioural control-intention relationships (Armitage & Conner, 2001). Because of this apparent weakness, other normative measures have been suggested as well, such as group norms (Terry & Hogg, 1996; Terry, Hogg, & White, 1999) and how identity and normative variables related to binge drinking (Gardner, de Bruijn, & Lally, 2012).

4.2.4 Summary of an expanded TPB

Because of the variance left unexplained by the TPB there is a search to fill the gap by researching various constructs ranging from impulsivity and habit to normative variables and social identity (Tajfel & Turner, 1979) as possible factors important to the decision making process. These additional construct can help predict behaviours and offer a focal point for interventions. Social identity and the TPB is discussed in more detail in section 4.3 and specific additions particularly relevant to the upcoming studies will be discussed in the appropriate empirical chapters.

4.3 Social Identity and TPB

This section will examine the Social Identity Theory (SIT) developed by Tajfel and Turner in the 1970s and research supporting the use of the theory alongside the TPB. It will begin by defining and contextualising the SIT in relation to the TPB. Then, empirical support for using the theories together will be detailed before finally summarising what it means for this research.

4.3.1 What is the Social Identity Theory?

Social Identity Theory (Tajfel & Turner, 1979) is a general theory of group processes and intergroup relations which distinguishes group phenomena from interpersonal phenomena. SIT suggests that people define and evaluate themselves by a self-inclusive social category such as sex, class or team. It states that the processes of categorisation and self-enhancement are involved. Categorization is differences between in-group and out-group and similarities among in-group members (including self) on stereotypical dimension which are perceptually accentuated. Self-enhancement is defined in terms of group membership seeking behaviourally and perceptually to favour the in-group members. Importantly, when social identity is salient, people use available shared information to construct a context-specific group norm which describes and prescribes beliefs, attitudes, feelings and behaviours that optimally minimize in-group differences and maximize intergroup differences. These in-group norms or prototypes influence the process of self-categorization, meaning the person assimilates the self to the prototype transforming their self-perceptions, beliefs, attitudes and behaviours to be defined in terms of the group prototype rather than unique properties of the self. According to Terry, Hogg, and McKimmie (2000) it is not surprising the lack of evidence linking norms to behavioural intentions given the fact that subjective norms are not tied to a behaviourally relevant reference group. Norms of such a group could influence intentions to engage in a behaviour but the extent to which a group membership is a salient basis for self-definition also needs to be taken into account. A link between the norms of a behaviourally relevant group and a person's attitude toward the behaviour should also be expected. Evidence supports the extent of attitude-behaviour consistency is influenced by the attitudinal congruence of in-group normative information (Terry et al., 2000). Basically, as norms measures in the TPB have been criticised for being weaker there is interest in using the SIT to investigate the role of norms in attitude-behaviour relations.

4.3.2 Empirical Support for SIT and TPB

4.3.2.1 *Binge-Drinking: A Test of the Role of Group Norms in the Theory of Planned Behaviour*

In an important empirical study pairing SIT with the TPB, K. Johnston and White (2003) assess the utility of the Theory of Planned Behaviour (TPB) in the prediction of students' binge-drinking as well as test the role of group norms and identity as a way to bolster the usually weak element of subjective norms in the TPB. The research is carried out in an Australian university where 289 first year undergraduate students enrolled on an introductory psychology course participated. The sample is majority female (80%) with a mean age of 26 years with 77% of the participants completing the follow-up questionnaire at time 2. A longitudinal approach is used with a two-week interval between the initial TPB questionnaire and the self-reported binge-drinking behaviour questionnaire. Binge drinking is defined in this instance as the consumption of five or more standard alcoholic beverages in a single session. The questionnaires measure TPB components (intentions, attitude, subjective norms and perceived behavioural control), group norms and group identity with the follow-up questionnaire measuring binge-drinking behaviour. K. Johnston and White (2003) confirm basic findings of research testing the utility of the theories of reasoned action/planned behaviour where attitude, subjective norm and self-efficacy are predictive of binge-drinking intentions. Behavioural intentions predict self-reported binge-drinking behaviour which is consistent with the TPB. Additionally, the effect of group norms on students' intention to binge-drink is moderated by group identification whereby the effects of norms are more important for individuals who strongly identify with the reference group. This research provides a greater understanding of the role of social influence on attitude-behaviour relations by contributing to the research findings for a social identity theory approach to understanding the role of norms in the TPB but also contributes to the evidence for the application of the TPB to binge-drinking. Future research should also investigate the variables using a wider range of participant populations as well as considering other explanations for the poor predictive value of subjective norms such as an individual difference approach.

4.3.2.2 *The theory of planned behaviour: Self-identity, social identity and group norms*

In research focusing in more depth on the SIT alongside the TPB but with recycling behaviour, Terry et al. (1999) examine the role self-identity plays in the theory of planned behaviour. The combined effects of self-identity and social identity constructs and self-categorisation theory is tested and the effects of self-identity as a function of past experience of performing the behaviour is assessed. They work with the assumptions that the TPB alone, attitudes specifically, is not the best predictors of behaviour. The participants consist of members of households with access to recycling bins provided by their local council. There are 63 male and 80 female participants

(N=143) and the ages range from 17 -59 years old. The study is longitudinal with the first questionnaire assessing participants' intentions to engage in recycling as well as the proposed predictors of household recycling (TPB measures as well as self-identity, past behaviour, group identity and group norms). The second questionnaire occurs two weeks later measuring participants reported recycling in the previous two week period. The findings show self-identity has an indirect relationship with reported behaviour through behavioural intention, a relationship that is not dependent on the extent to which the behaviour has been performed in the past. Additionally, results demonstrate that identity-related influences on intention should be broadened to encompass role identities as well as a focus on the part of the self-concept that derives from group membership. The perceived norm of a behaviourally relevant reference group is related to intentions for people who strongly identify with the group but not for those who did not. Self-identity emerges as an independent predictor of intentions and these results are consistent with other research. This study measures a different behaviour to binge drinking but provides important information on research using the TPB and SIT in predicting behaviours.

4.3.2.3 Aspects of identity and their influence on intentional behaviour: Comparing effects for three health behaviours

Hagger, Anderson, Kyriakaki, and Darkings (2007) examined the effects of dispositional aspects of identity on intentions and behaviour in the context of the theory of planned behaviour for three health behaviours: exercise, dieting and binge drinking. There were 525 participants completing measures of personal and social identity in conjunction with measures of attitude, subjective norm, PBC and intention from the TPB for the three behaviours. The sample consisted of students from two UK universities.

This research provided some support for the processes by which aspects of identity influence intentions and behaviour. Significant effects of personal identity on attitudes and PBC were found in the exercise and binge drinking contexts and structural equation modelling showed that personal identity influenced PBC for all three behaviours, affected attitude and subjective norms positively in the exercise sample, and influenced attitude and subjective norms negatively in the binge drinking sample. They also found that social identity positively affected attitudes, subjective norms and PBC in the binge drinking sample only and there were no direct effects of the identity constructs on intentions and behaviour. The article's findings are in line with previous TPB research and suggest that these identity aspects are influential in the decision-making process for these health behaviours.

Some limitations of the study were the use of a small range of health behaviours and the sample was from a homogenous group. A broader sampling from the wider population and use of a range of other health behaviours could improve the generalizability of the current findings and strengthen support for model.

4.3.2.4 The Role of Self-identity in the Theory of Planned Behaviour: A Meta-Analysis

A meta-analysis by Rise, Sheeran, and Hukkelberg (2010) sought to evaluate the role of self-identity in the theory of planned behaviour. The aim was to provide a meta-analytic integration of research of self-identity and the TPB with the review aim to: quantify the strength of the relationship between self-identity and behavioural intentions; estimate the increment in the variance in intentions that is attributable to self-identity after TPB variables have been taken into account; estimate the increment in variance attributable to self-identity after both TPB variables and past behaviour have been taken into account; and assess whether intention mediates the self-identity/behaviour relationship.

They used social scientific databases, reference lists of identified papers were evaluated for inclusion and authors of published papers were contacted for potential unpublished studies and studies that were in press to collect the samples of studies. The criteria they needed in order to be included in the review were a bivariate statistical association between self-identity and behavioural intention and they also coded correlations for future behaviour, past behaviour and TPB variables. They used 40 independent tests of the self-identity/intention relation from 33 papers, applying multiple regression analyses to get their results.

The meta-analysis found that self-identity, overall, exhibited good predictive validity across a wide range of behaviours. The findings indicated that the self-identity/intention association was robust and self-identity possibly has different motivational origins compared to attitude and subjective norms. Also, self-identity is distinct from group identity. The study provided evidence that the concept of self-identity was conceptually and empirically distinct from the TPB and past behaviour.

4.3.2.5 Summary of empirical support for social identity

This section will summarise the findings from the empirical research supporting the use of SIT alongside the TPB and discuss how these can be used to inform the upcoming studies in this thesis. First and foremost, the empirical research showed continued support for the TPB. They also highlighted, in regards to social identity, norms were more important for those more strongly identifying with the in-group. Self-identity was found to be important with indirect relationships with behaviour, exhibited good predictive utility across a wide range of behaviours including binge drinking and appeared as a distinct concept from the TPB. It was also suggested to broaden identity-related influences on intentions to include role identities. Experimental test using identity showed promising results where identity manipulation and avoidance appeared to influence TPB variables, the attitude-behaviour relationship, intention and behaviour and may be useful in mitigating risky behaviour. These findings were used to inform the subsequent studies of this thesis.

4.4 Chapter Summary

This section will sum up the main points drawn out through the literature review above. It will begin with how alcohol impacts public health and consequences of alcohol consumption followed by a discussion of how alcohol is consumed, factors that affect alcohol use and ways of and difficulties in measuring alcohol consumption. Different theoretical approaches to understanding drinking are discussed with more detail on the theory of planned behaviour (TPB) and social approaches to understanding binge drinking behaviour including the social identity theory (SIT).

Overall, alcohol is an historic problem globally not only to personal health but also to public health and society. Alcohol may have a few positive health effects like a possible reduction in coronary heart disease but more importantly has striking negative physiological health effects such as liver disease, greater risk of sexually transmitted infections and reproductive disorders. It also has non-physiological effects such as reduced performance in school or work and poor mental health. Besides the effects on the individual, risky alcohol consumption impacts family, friends and the wider society surrounding a drinker. This may happen through an increase in physical harm to others including injury either intentional (e.g. assault or homicide) or unintentional (e.g. traffic crash or workplace accident). Neighbours or family may be impacted through property damages and experience psychological harm due to loss of peace of mind due to neglect or abuse. The wider society bears the costs of medical care to those who abuse or through care of injured individuals as well as recovery and prevention efforts. A decrease in harm caused by alcohol would clearly ease the pressure on the health system and law enforcement officials which would lead to a decrease in cost to the public and less stress on family and friends caring for those drinking at risky levels.

Understanding how alcohol is consumed is important not only globally but in the UK as well. Compared with other nations in Western Europe, the UK has high prevalence rates of alcohol use. Countries with strict alcohol laws have lower consumption rates (e.g. Saudi Arabia) than countries in Europe and the Americas where there is a more permissive culture surrounding alcohol. The differences in consumption between more accepting cultures in the Western world is based on patterns in which the alcohol is consumed from binge drinking to casual drinking during meals. In Southern Europe where alcohol consumption is widely accepted socially, binge drinking is less common and alcohol is more often consumed during meals. Patterns of drinking are strongly linked to health outcomes and vary by region. Prevalence rates in a European context show male students are consuming alcohol more frequently and at higher quantities than female students. They are also more likely to participate in risky single occasion drinking but importantly one exception to this finding is the UK. The gender differences in alcohol consumption are not found in the UK but this may be due to the way high risk use is defined here. Prevalence rates in the UK may have decreased in recent years but is still higher than those in the US and Canada and university students in the UK drink more than their similarly aged non-university cohort. This

highlights the need for understanding more about the decision making process of university students to binge drink in order to attempt to decrease this phenomena to improve the health and safety of these individuals. The first step in this is to define what problematic drinking looks like.

Defining heavy drinking, and binge drinking specifically, has been varied throughout research and often differs by region. There are definitions of binge drinking defined by episodes with varying number of drinks, by subjective feelings of drunkenness and by units of alcohol consumed. Though, in social psychological research on alcohol in the UK it is common to define binge drinking in terms of episodes involving 5 or more standard drinks (e.g. a pint of lager) in a row for both men and women and this method in terms of gathering self-report data seems most appropriate due to the ease of recall and understanding. After deciding on a definition of binge drinking it is important to understand what factors may influence binge drinking behaviours.

Many factors play a role in university age students' drinking in the UK and across Europe. Factors affecting drinking behaviours can be broken down into internal and external. Internal factors can be defined as those which occur within the individual for example cognitions, mental health and genetic influences whereas external factors are those which influence the individual from the outside world such as societal norms, culture and religion. Other important factors in alcohol consumption include ethnicity (e.g. those from Asian, Middle Eastern or African countries consume less compared with Europe) which reflects cultural influences and socioeconomic status (e.g. students with greater socioeconomic status more likely to consume alcohol frequently). Many external factors like cultural norms and religion are internalised through attitudes towards drinking showing both internal and external factors are linked, both playing an important role in influencing risky behaviours. After identifying the contributing factors, the task then becomes how to most accurately measure them.

There are some difficulties when it comes to measuring risky behaviours like alcohol consumption. Popular methods that have been used in previous research to measure binge drinking behaviours include drinking diaries, sales figures and self-report. Often, risky behaviours like this that are seen as negative can lead some to withhold information about their consumption rates or behaviours when asked directly. This is a source of concern when considering using self-report measures of drinking behaviour specifically but recent binge drinking studies have successfully employed self-report measures and found ample evidence that they are a valid way of gathering this data over a one to two-week period for young people. Therefore, self-reported binge drinking over a one to two week period is used in this thesis to measure undergraduates binge drinking behaviour.

Before deciding on which theoretical approach to understanding drinking behaviour is most appropriate, it is important to consider the different perspectives used to explain drinking behaviour. There are several theories including developmental, biological, personality, motivational, cognitive and social. All of these explain some portion of behaviour but leave out

key elements often covered by another. For example, some social theories of drinking focus on external social influences on decisions to drink transmitted through norms to an individual but fail to consider key internal factors that may influence behaviour such as personality. It is clear that both external and internal factors across a broad range of theories influence the decision making process to binge drink. A model using both factors to explain behaviour in young people will be useful and many social cognitive models do this. This is where psychosocial theories can help explain complex behaviours like binge drinking.

Health behaviour psychosocial theories, those used to explain, predict and change health related behaviours like healthy eating, exercising or binge drinking, use a number of cognitive and affective factors such as beliefs and attitudes. A few popular models include the Health Belief Model, Protection Motivation Theory, Self-Efficacy Theory, the Theory of Reasoned Action and the Theory of Planned Behaviour (TPB). Many of these models differ in their degree to which they specify the content of the cognitions they identify and many models are currently being developed to account for what others may be lacking. Support has been shown for the TPB as a superior predictor of intentions and behaviour and has high degrees of standardisation of measures. As a model, it includes many of the other theories' considerations and importantly is well established with alcohol and binge drinking research. The model is frequently expanded to include other explanatory variables, often some that do not necessarily affect deliberative processing helping to explain additional variance and therefore this theory will be the model used to explore undergraduates' binge drinking in this thesis.

The TPB is a deliberative processing model which implies individuals make behavioural decisions based on a careful consideration of available information. The primary determinants of future behaviour are intentions to perform the behaviour and subjective perception of control over the behaviour (PBC). Intentions can be predicted by attitudes, subjective norms and PBC. When the model is used to predict drinking behaviour, intentions and PBC account for an average of 28% of the variance while the variables predicting intentions explain between 40 and 50 percent of the variance. It is obvious from these numbers that some variance is left unexplained by the model and it has been acknowledged there is room for expansion to improve its predictive ability. Explanatory variables that can be considered when helping to explain the gap include automaticity, impulsivity and wider social influences. These are elements the TPB does not consider and may increase the explained variance in drinking behaviour. Automaticity is an important construct as a majority of everyday behaviours are repeated and become habit, or behaviours performed without much cognitive effort like putting on a seatbelt when getting into a car. This may be important when considering undergraduates alcohol consumption as this behaviour may become automatic when attending nights out or house parties. Impulsivity, or the inability to wait, is associated with risky behaviours and is involved in the etiology of substance use, misuse and disorders. Therefore impulsivity is another variable to take into account when looking at students binge drinking. It may be that students do not deliberately plan to binge drink but act on impulse

when confronted with an unplanned situation. Individuals who tend to be more impulsive may be more subject to binge drinking in these situations.

Social Identity Theory is a general theory of group processes and intergroup relations distinguishing group phenomena from interpersonal phenomena and offers an important addition to the TPB because the TPB does not consider wider social normative influence on intentions and behaviour. Group norms influence intentions to engage in a behaviour and the degree to which an individual identifies with a particular group impacts the rate at which one will adopt behaviours of the referent group. If a student identifies strongly as an undergraduate and believes undergraduates all binge drink they should be more likely to have higher rates of that behaviour.

In summary, the TPB is a good model for predicting binge drinking behaviour and additional elements of automaticity, impulsivity and consideration of wider social norms and identity should help explain additional variance in binge drinking behaviour. This literature review has compared the theoretical, methodological and empirical accounts of binge drinking in populations of young people and argues that further advancement in the field in terms of an improved ability to understand and predict binge drinking is likely best served by further expansion and adaptation to the basic premises of this useful model. This is the basis on which the following empirical studies are designed to improve our understanding of how young people make decisions about whether or not to engage in binge drinking behaviour as well as our ability to predict it.

5 Chapter 5: Applying an Expanded TPB to Binge Drinking

5.1 Chapter Overview

Chapter 5 will outline the details of the first study undertaken, explaining the use of an expanded Theory of Planned Behaviour to predict binge drinking intentions and behaviour while considering additional variables such as habit, impulsivity and social identity and their role in explaining behaviour above and beyond that of the traditional model. First, there will be a brief introduction about the TPB. This will be followed by a discussion of the planned additions to the model – habit, impulsivity and social identity. Then, the central research questions will be outlined before the methods, results and discussion sections conclude the chapter. The study's sample included undergraduate students at UEA. They completed a longitudinal (1 week follow-up) theory of planned behaviour questionnaire. Quantitative analysis was applied to the data. 229 undergraduates took part in time 1 (male n=68, female n=161) and 168 completed the behaviour questionnaire at time 2. Attitudes as part of the TPB were predictive of intentions to binge drink while habit and social identity measures significantly increased the amount of explained variance in binge drinking intentions over and above that of the basic TPB variables (attitude, subjective norms and PBC). Also, binge drinking intentions and habit were predictive of self-reported binge drinking behaviour.

5.2 Introduction to Study 1: Binge Drinking and Young People: An Expanded Theory of Planned Behaviour Including: Habit, Impulsivity and Social Identity Theory

The theory of planned behaviour is a deliberative processing model in that it implies that individuals make behavioural decisions based on a careful consideration of available information (Armitage & Conner, 2001; Beck & Ajzen, 1991; Conner & Norman, 1995). The theory of planned behaviour (TPB) has been described in greater detail in Chapter 4, but to review it states that the determinants of future behaviour are one's intentions to perform that behaviour (e.g. 'I intend to engage in a binge drinking session in the next week') and the subjective perception of having control over behaviour or 'perceived behavioural control' (Cooke et al., 2007). In turn, intentions are predicted by attitudes, subjective norms and perceived behavioural control (PBC). Attitudes are a person's positive or negative evaluations of performing the focal behaviour (e.g. 'For me to engage in a binge drinking session in the next week would be...' unenjoyable - enjoyable). Subjective norms are a person's perception of other people's opinions regarding behavioural performance (e.g. 'Most people who are important to me think that I should engage in a binge drinking session in the next week'). Perceived behavioural control refers to a person's sense of control (e.g. 'I am confident that I can engage in a binge drinking session in the next week') over performing the behaviour under study and often has a direct and indirect (through intentions) effect on predicting behaviour (Cooke et al., 2007). Taken together, attitude, subjective norms and

perceived behavioural control measures are often predictive of behavioural intention scores which appear to be the immediate determinant of actual behaviour (Beck & Ajzen, 1991).

According to Beck and Ajzen (1991), the TPB can be extended if other variables are found to contribute to the prediction of behaviour after controlling for the existing components. The theory has been applied to a range of health related behaviours including exercising, food intake, smoking and binge drinking (Dietze & Livingston, 2010; McMillan & Conner, 2003b; Norman & Conner, 2006; Williams & Hine, 2002). It has been well established in psychology and should be a useful basic framework for understanding alcohol consumption in young people (Ajzen, 1988; Fishbein & Ajzen, 1975; Manning, 2009). The predictive utility of the model has been shown to be augmented by a number of variables including self-identity, group norms, group identification and impulsivity (Ajzen, 2011; Churchill et al., 2008; K. Johnston & White, 2003; Terry et al., 1999). These have been useful additional predictors for a range of health related behaviours, such as intense physical activity and unhealthy food intake; we would like to see if this could also be true when applied to the behavioural domain of binge drinking. Expanding the model to include the variables of habit, impulsivity and social identity were hypothesised to improve the predictive ability of the TPB for intentions and self-reported behaviour. The following sections will provide an overview of the research on each of the proposed additional variables, namely: habit, impulsivity and social identity.

5.2.1 Habit and past behaviour as additions to the TPB

5.2.1.1 *What is habit?*

As discussed in the previous chapter (section 4.2.1), habits could be an important additional component to the TPB model (Norman, 2011) representing trajectories of reasoning that are more heuristic than deliberative (Chen & Chao, 2011). Verplanken and Aarts (1999) defined habits as learned sequences of acts that become automatic responses to specific cues and which are functional in obtaining certain goals. Behavioural repetition is necessary for a habit to develop while the defining quality of a habit is the automaticity and efficiency of the behaviour occurring in a stable context or in response to a specific stimulus, cue or behavioural opportunity (Verplanken, 2006). Habits conserve cognitive resources by avoiding unnecessary detailed deliberative processing prior to simple behaviours. For example, it would be cognitively expensive if every time an individual needed to buckle their seatbelt they had to carefully and consciously think about reaching for the belt, grasping their fingers around it, and then buckling it. It is adaptive to have built an automatic response to this where the seatbelt is buckled without much conscious thought and this can be something to consider when looking at components of risky behaviours like binge drinking.

5.2.1.2 *Habit formation*

Exploring habit formation now will help to explain the relationship it has with the reasoned action perspective. According to Ronis, Yates, and Kirscht (1989) habits are formed through routinisation (repeated performance produces habituation) and once a habit has developed it is said to come under the control of stimulus cues. This would indicate that on future occasions, in similar circumstances, the automatic response would be triggered meaning a stable stimulus context would be necessary for habitual behaviours. The routinisation approach has been consistent with a reasoned action perspective as the TPB does not propose that individuals review their behavioural, normative and control beliefs prior to every frequently performed behaviour. Instead, attitudes and intentions (once formed and well-established) are assumed to be activated automatically and without conscious supervision (Ajzen, 2002b; Ajzen & Fishbein, 2000). While Ajzen (2002b) has noted that frequency of past behaviour was not a valid indicator of habit strength he has highlighted that the habituation (or routinisation) and reasoned action perspectives differed semantically (the habituation approach proposes that the behaviour is under the control of stimulus cues whereas the reasoned action approach proposes that the behaviour was guided by automatically activated or spontaneous attitudes and intentions). The overall message gained from this assessment of the relationship between habit and the TPB is that so long as the context remains relatively stable, routinized behaviour can be performed in a largely automatic fashion with only *minimal* conscious control required.

5.2.1.3 *Habit and past behaviour*

The frequency with which a behaviour has been performed in the past can be a good predictor of later action and it has been proposed that the residual effects of past behaviour (and its repetition) on later behaviour can be attributed to habit (Ajzen, 2002b). According to the TPB, measures of intention and PBC should fully mediate the effects of earlier experiences on later behaviour. However, the frequency with which a behaviour has been performed in the past has been found to account for variance in future behaviour independent of intentions in some studies (Ouellette & Wood, 1998) and some have even argued that past behaviour is the best predictor of future behaviour (Bamberg, Ajzen, & Schmidt, 2003). This has often been held as evidence for habit as complementing the reasoned mode of operation assumed by models like the TPB because it is an example of a dual process model when viewed this way (with a fast heuristic route and a slow deliberative one). Some consideration should be given in regards to habit and consuming alcohol as habit scores could sometimes be reflective of problem drinking or addiction. For example, unhealthy amounts of alcohol may be consumed often and without much thought for reasons associated with the mental health of the individual or because of constant external and situational pressures to do a behaviour that has not been measured directly (Ajzen, 2002b). To explain the complex relationship between habit strength and intentions in greater detail, individuals drinking

more habitually have been shown to have weaker intention-behaviour relationships when compared with individuals reporting modest or low habits (de Bruijn & Rhodes, 2011). Some have suggested that habit places a boundary limitation on the applicability of the TPB and that the operation of stronger habits may be an explanation of the intention-behaviour discrepancy (de Bruijn et al., 2008; Verplanken, Aarts, Van Knippenberg, & Moonen, 1998). For example, those showing lower levels of habit strength would have a stronger intention-drinking relationship due to the lack of automaticity and need for deliberative processing to engage in the behaviour.

Habit has also been shown in some work to independently predict behaviour suggesting automatized behaviour could be measured within TPB research without the need for measuring past behaviours which would be beneficial for measurement brevity (de Bruijn & Rhodes, 2011). Unlike the TPB, which assumes the behaviour is reasoned, deliberately controlled and deliberately planned, habit has been perceived as an automatic link between a goal and a specific behaviour or as a behavioural script stored in a memory (Aarts & Dijksterhuis, 2000; Verplanken & Aarts, 1999). As habitual behaviour only demands a small amount of attention, when habit levels are stronger the individual's control over behavioural intention (as well as control over a behaviour) becomes weaker and as long as circumstances remain relatively stable past behaviour can easily affect later behaviour (Chen & Chao, 2011). In this instance, the behaviour would not be completely reasoned and past behaviour could be measured as a proxy for habit (where frequent past behaviour suggests greater habit formation) playing an important role in predicting future behaviour as shown in previous studies (Bamberg et al., 2003; Ouellette & Wood, 1998). There is some question about whether the use of past behaviour as a predictor of future behaviour is theoretically sound as this raises the question of how behaviours would ever change if they were always predicted by past behaviours (Sutton, 1994). Common method variance may also be an issue as measures for past and future behaviour are similar possibly causing inflations in variance and correlations (Temme, Paulssen, & Hildebrandt, 2009). Though these issues exist, there has been much research to support the use of habit and past behaviour within the TPB model. The following sections will discuss habit formation and the theories and research that have focused on habit and past behaviours as determinants of future behaviour as evidence these could be used in a similar way to predict binge drinking intentions and behaviour.

5.2.1.4 Key empirical examples regarding the role of habit in health related behaviours

Ajzen (2002b) has called for an independent and validated measure of habit to be developed and used in conjunction with the TPB. An appropriate approach would rely on an operationalization of habit as being independent of the behaviour it was supposed to explain and predict. This section will discuss three studies as key examples of empirical research regarding the role of habit in

health related behaviours: Verplanken et al. (1998); de Bruijn and Rhodes (2011); and finally, an article by de Bruijn et al. (2008).

5.2.1.4.1 Habit versus planned behaviour: A field experiment

Verplanken et al. (1998) investigated the prediction and change in repeated behaviour in the domain of travel mode choices. They tested an independent measure of habit which included two self-reported measures of frequency of past behaviour and a scripted behaviour index (which involved responding as quickly as possible to which travel mode they would choose when travelling to 1 of 15 travel destinations in pictures). It was hypothesised that once a behaviour became routine the frequency of past behaviour should be a good predictor of future behaviour but it should not mediate the impact of intentions. 200 participants were recruited from a Dutch village and took part in a prospective study over a week period involving a face-to-face structured interview and 7-day travel diary. The study found habit strength to be a moderator in the intention-behaviour relation which was in particular demonstrated by the interaction of intention and habit. The direct path from habit to future behaviour was weak and not significant (multiple $R = .52$, F change = 1.33) indicating that inclusion of their scripted behaviour index failed to support the assumed mediating role of habit. Their findings suggested both deliberate decision making (as represented by the impact of behavioural intentions) and spontaneous processes related to habit may determine behaviour (specifically travel choices) while the relationship between them would be dependent on the strength of habit and complexity of the behaviour. This meant the TPB model was more successful in modelling antecedents of behaviour when habits were weaker because more deliberate processes were involved in carrying out unfamiliar or complex behaviours. It was highlighted that habit formation does not occur in a vacuum but often takes place in a social normative environment where elements of the TPB such as attitudes (of the individual and society) intentions and control (perceived and actual) are important factors. When asked to report behavioural intention, individuals may reference their past behaviour and current environment to determine what they might do in the future and this is where measurement overlap and the relationship between habit and planned behaviours becomes complex. Ajzen (2002b) suggested that the limits of reasoned action were not forming the habit with repeated performance but may instead be related to other factors. These could be inaccurate/unrealistic behavioural, normative and control beliefs; weak or unstable attitudes and intentions; or inadequate planning required for successful implementation of an intended behaviour. Overall, it was suggested that some care should be taken when attempting to measure and understand the relationships between habit and past and future behaviours.

5.2.1.4.2 *De Bruijn and Rhodes (2011): Exploring exercise behaviour, intention and habit strength relationship*

Empirical research exploring the relationship between habit and TPB components in the health behaviour domain by de Bruijn and Rhodes (2011) examined the predictive capability of the self-report habit index (SRHI) to predict self-reported exercise behaviour. The analysis controlled for intention and PBC with moderate and strenuous intensity physical activity. An evaluation by intensity of physical activity was carried out considering the predictive capabilities of habit, intention and PBC. It was expected that habit would have a stronger relationship with behaviour for moderate physical activity compared to strenuous physical activity based on the rationale that lower intensity behaviours would be less influenced by conscious motivational considerations. It was predicted that behaviours that would be easier to carry out would lend themselves more often to developing habits and those requiring more effort would require more volitional control. Also, the predictive capabilities of these constructs while controlling for conscious deliberation in the initiation of physical activity were examined.

Results showed that habit independently predicted behaviour and that there was a marked difference between the intention-habit interactions. Individuals who reported stronger habits showed a weaker intention-behaviour relationship when compared with individuals who reported modest or low levels of habit. Participants who reported a greater level of vigorous physical activity (stronger habits) demonstrated a stronger intention-behaviour relationship than their modest and low levels of habit counterparts. Those reporting frequent past physical activity were more likely to intend to participate in future physical activity and to subsequently do the behaviour. These findings support the notions that some properties of physical activity may have an automatic component; habit may therefore be important to physical activity action initiation.

There were some limitations. For example the measure of behaviour was obtained through self-report. This may have contained measurement error from recall bias but may not have impacted the overall findings of this study unless it affected intention, intensity or habit differently. Though self-report measures can be criticised, they have been discussed in Chapter 2 (section 2.5.1) and they have been found to be appropriate for binge drinking research. Also, the measure of intention used in this research may not have been representative of the spectrum of volitional physical activity motivation meaning that different measures could have yielded other results. They also could have used the full measure for habit (SRHI) instead of only 5 of the items from the set of 12. This could have provided data on how the full measure worked with the model. Finally, the university sample may not easily generalise to a wider population; replication of the findings using a more representative sample would be useful. In conclusion, habit has been an important predictor of behaviour explaining additional variance in physical activity and the relationship between habit and the TPB warrants further research especially regarding binge drinking in young people. It will be interesting to see if level of intensity may be important when considering alcohol consumption

levels where moderate levels of drinking may be more susceptible to habit formation than higher intensity consumption levels such as binge drinking.

5.2.1.4.3 De Bruijn et al. (2008): Saturated fat consumption and the Theory of Planned Behaviour: Exploring additive and interactive effects of habit strength

Other research linking the TPB and habit strength by de Bruijn et al. (2008) has explored the additive and interactive effects of habit strength in the explanation of saturated fat intake within the framework of the TPB. This is relevant to the empirical study as it provided details of the relationship between the two variables in a health behaviour context. Saturated fat intake relates reasonably well to binge drinking behaviour as both are health-related ingestive behaviours. Key hypotheses were (1) habit strength will increase the amount of explained variance in saturated fat intake, and (2) habit strength will moderate the association between intention and saturated fat intake with a weaker association for those with higher habit strength. Measures of the TPB and the SRHI were used with cross-sectional data from participants in an intervention trial aimed at testing computer-tailored nutrition education to reduce saturated fat intake. The results supported both hypotheses showing habit strength significantly increased the amount of explained variance in fat intake scores and habit strength also moderated the intention-behaviour relationship. Habit strength ($r = -.26$) was, after PBC ($r = -.27$), the strongest correlate of saturated fat intake and a stronger correlate than intention ($r = -.25$). For those with stronger habit scores, intention was a weaker and non-significant predictor of fat intake, which supported previous research indicating that the relation between intention and behaviour may have been dependent upon habit strength with intentions becoming less relevant when behaviour is more habitual. One issue common in TPB studies has been the use of cross-sectional data. Such data presented conceptual problems as the causal ordering in the TPB was ignored and associations between TPB variable may have become artificially inflated. There was also an over-representation of highly educated participants, which could have been corrected by sampling a wider group outside of workplaces. Though saturated fat intake was a similar behaviour to binge drinking in the sense it was an ingestive behaviour, it may have been very different regarding the frequency and social contexts in which the behaviour was carried out. More research is needed using habit alongside the TPB in the alcohol and binge drinking field but the research has shown that habit could be a useful tool in predicting health related intentions and behaviour. It will now be important to address which measures of habit will be appropriate for this research which will be the goal of the following section.

5.2.1.5 A comparison of available measures

Following on from this, there are several available scales for measuring habit and these will now be reviewed. Four measures are widely used; self-reported frequency of past behaviour; self-reported habit frequency; the response frequency (RF) measure; and the self-report habit index

(SRHI). Table 5.1, drawn from Verplanken, Myrbakk, and Rudi (2005), shows the ways in which these measures differed using five characteristics. The first characteristic, type of measure, will refer to whether each measure required participants to reflect on their own behaviour with self-reflections described as meta-judgmental and others described as operative (e.g. response latencies). The second characteristic will show whether the measure was a single or multiple-item measure while the third characteristic will show whether the measure asked the participants to make behavioural frequency estimates. The fourth characteristic will indicate if the measure applied to decisions with multiple behavioural operations while the fifth characteristic shows if the measure was usable in self-administered questionnaires. Verplanken et al. (2005) considered psychometric properties, conceptual clarity, external validity, vulnerability to biases and practical aspects such as applicability and ease of use as important criteria for evaluations of habit. The four measures varied in their degree of reliability but the researchers concluded that knowing which measure was best depended on what the goal of the measurement would be. They suggested that the SRHI was a better measure if one wished to tap the degree to which a particular behaviour was habitual and that frequency measures could not provide information about other features of habit such as the degree and quality of automaticity like the SRHI seemed to do. The SRHI measures habit as a psychological construct and gave researchers the opportunity to represent different qualities of habits. The SRHI allowed the researchers to monitor changes in habit strength and habit qualities longitudinally and as a result of an intervention. For these reasons the SRHI measure of habit will be used in this research as it appears to be the most appropriate measure of habit regarding binge drinking behaviour in a social psychological context.

Table 5.1 – *Characteristics of the four habit measures*

<i>Characteristic</i>	<i>SRF</i>	<i>SRHF</i>	<i>RF</i>	<i>SRHI</i>
<i>Type of measure</i>	Meta-judgmental	Meta-judgmental	Operational	Meta-judgmental
<i>Single/Multi Item</i>	Single	Single	Multiple	Multiple
<i>Frequency estimate</i>	Yes	Yes	No	No
<i>Multiple options</i>	No	No	Yes	No
<i>Self-administered questionnaires</i>	Yes	Yes	Preferably not	Yes

Note: SRF – self-reported frequency; SRHF – self-reported habit frequency; RF – response frequency measure; SRHI – self-report habit index.

5.2.1.6 Self-reported habit index – a meta-analysis

Further to the above, a recent meta-analysis (Gardner, de Bruijn, & Lally, 2011) also showed that the SRHI was an effective way of measuring the influence of habit on behaviour through a detailed comparison of empirical findings. Table 5.2, drawn from the meta-analysis, lists some empirical studies employing the use of the SRHI within the TPB. The table shows details on the samples, design, behaviour measured (which will include a range of ingestive and health related behaviours) and the means and standard deviations for the scale. The research questions addressed in this review were: (1) How habitual have dietary and physical activity behaviours been in previously studied samples?; (2) What is the overall association between habit and behaviour in studies of nutrition and physical activity?; and (3) Does habit consistently moderate the intention-behaviour relationship in studies of nutrition and physical activity? Articles were found through a systematic search for relevant articles and a screening process was carried out to gather all the important information. Evidence around mean habit strength, habit-behaviour correlations and habit x intention interactions, from applications of the SRHI to dietary, physical activity and active travel behaviour was reviewed. Some of the main points drawn out by Gardner et al. (2011) were that interventions which succeed in changing intentions tended to generate relatively small-sized effects on behaviour and this intention-behaviour gap indicated that action was not consistently guided by motivation. The results showed twenty-three habit-behaviour correlations and nine habit x intention interaction tests. They also showed that typical habit strength was located around the SRHI midpoint and weighted habit-behaviour effects were medium-to-strong. Habit also moderated the intention-behaviour relation. A key limitation was that often the research reviewed used cross-sectional data, therefore modelled habit as a predictor of past behaviour, which failed to acknowledge the expected temporal sequence between habit and behaviour. These concerns could be addressed by more methodologically rigorous research like the study we are going to carry out as part of this thesis using a prospective design to provide conceptually coherent and less biased observations of the influence of habit on action.

Overall, the meta-analysis showed that the SRHI was a useful tool in exploring habits in conjunction with the TPB on a range of health and ingestive behaviours. Typical scores for habit strength were located near the midpoint of the SRHI and weighted habit-behaviour correlations were medium to strong ($r = .45$) which suggested that habit alone could explain approximately 20% of variation in nutrition and physical activity related behaviours. Similar findings of correlations with behaviour for intentions (.47), control (.37) and affect (.42) have been found indicating habit may be as important a proximal determinant of action as these constructs (Armitage & Conner, 2001; Rhodes, Fiala, & Conner, 2009). Though the measure has not been used often in binge drinking research, the reliability of the measure appeared very good and should contribute to the planned study looking at binge drinking habits and intentions.

Table 5.2 – *Applications of the SRHI within the TPB*

Author	Sample	Design	Behaviour	SRHI Mean (SD)
Gardner et al. (2012)	University students (UK)	Prospective	Binge drinking	2.08 (0.90)
Orbell, Blair, Sherlock, and Conner (2001)	Young people (UK)	Cross-sectional	Ecstasy use	1.67 (1.23)
De Bruijn (2010)	University students (Netherlands)	Cross-sectional	Fruit consumption	3.35 (1.28)
Tam, Bagozzi, and Spanjol (2010)	University students (USA)	Prospective	Unhealthy snacking	3.67 (1.35)
Conner, Perugini, O'Gorman, Ayres, and Prestwich (2007)	University students (UK)	Prospective	Eating sweets/chocolate	3.75 (1.58)
Verplanken and Orbell (2003)	University students (Netherlands)	Cross-sectional	Eating candies	3.59 (1.57)
Kremers and Brug (2008)	High school students (Netherlands)	Cross-sectional	Drinking sugar-sweetened drinks	2.49 (1.70)
Jurg, Kremers, Candel, Van der Wal, and De Meij (2006)	Primary school students (Netherlands)	Cross-sectional	Exercise	4.83 (1.15)
Chatzisarantis and Hagger (2007)	University students (UK)	Prospective	Engaging in active sport and/or vigorous physical activity during leisure time	4.77 (1.47)
Lemieux and Godin (2009)	University students (Canada)	Prospective	Using active commuting	4.02 (1.69)

All studies used a Likert-type scale ranging from 1-7.

5.2.1.7 Interim summary of habit and past behaviour

Habit has been defined as learned sequences of acts that become automatic responses to specific cues and functional in obtaining certain goals (Verplanken & Aarts, 1999). Research has shown that when a behaviour has been performed often and repeated, even considered a part of what the person does regularly (identity), habit formation can occur and little conscious thought may be put into carrying out the behaviour. The relationship between habit and the TPB is one that so long as the context remains relatively stable, routinized behaviours would be performed in a largely automatic fashion with minimal conscious control. Measuring habits may prove challenging as the relationship between habit formation and behaviours is complex but there are various ways of measuring habits, from single item frequency measures to multiple item measures like the SRHI. A scale for habit such as the SRHI could address the calls among TPB researchers and critics for a construct to measure automatic non-volitional aspects of decisions to binge drink. The SRHI appeared to be the best measure of habit for this research based on the meta-analysis and this was why it will be implemented in the first study, to examine how well habit will explain additional variance above that of the TPB and to predict binge drinking intentions and behaviour in young people. In conclusion, habit and past behaviour are important predictors of future self-reported behaviour. Much of the research discussed supported using habit in conjunction with the TPB to help explain additional variance above and beyond those variables found in the TPB. Interestingly, habit has not often been used in binge drinking research which is why it will be a benefit to test it further in this study. Habit will not be the only addition to the TPB as other elements such as impulsivity, descriptive norms and social identity may play an interesting role as well. These are examined in more detail in the next sections.

5.2.2 Impulsivity

5.2.2.1 What is impulsivity?

As discussed in section 4.2.2, impulsivity is another construct to consider when investigating decisions to binge drink. There has been little consensus on how impulsivity should be defined exactly. Salient operational definitions have included the inability to inhibit impulsive functioning to achieve a goal or comply with a request (Kagan, Rosman, Day, Albert, & Phillips, 1964; Schachar, Tannock, & Logan, 1993), the inability to wait for a desired object or goal (Barkley, 1994; Mischel, Shoda, & Rodriguez, 1989) and the inability to behave in a socially appropriate manner in the absence of external controls (Kopp, 1989). Impulsivity as a behavioural construct has been considered to encompass a wide range of what are often considered maladaptive behaviours (Reynolds, Ortengren, Richards, & de Wit, 2006). According to Parker and Bagby (1997) there seemed to be some common links between the dimensions included in most measures of impulsivity such as the tendency to engage in spontaneous behaviours or to have spontaneous thoughts including acting without thinking, quick decision making and impatience. Personality elements, including sensation seeking (the need for varied, novel and complex sensations and

experiences, and the willingness to take physical and social risks for the sake of such experiences) (Arnett, 1994), have also been explained through impulsivity which has been associated with an insensitivity to the long-term consequences of action (Cloninger, Przybeck, & Svrakic, 1991; Evenden, 1999). It appears that impulsivity is a multidimensional construct encompassing different risk aspects of personality.

Much research suggests that impulsivity, sensation seeking and risky behaviours such as drinking alcohol are linked (Miller et al., 2009; Vazire & Funder, 2006). Drug users often score higher than non-users on self-report measures of impulsivity, sensation seeking and inattention (Sher & Trull, 1994; Slater, 2003; Zuckerman, Ball, & Black, 1990). Impulsivity has appeared to function as a determinant and consequence of drugs use with impulsivity; it has functioned as a risk factor for drug experimentation, problematic drug use, inability to abstain and brief state-dependent increases in impulsive behaviours (De Wit, 2009). It has been argued to influence such varied behavioural outcomes as antisocial behaviour, drug and alcohol use/abuse and risky sexual behaviours. Impulsivity has not contributed to risky behaviours independently as it has been influenced by expectancies about the outcome of behaviours as well (Carlson & Johnson, 2012). For example, if an individual with higher impulsivity did not expect drinking alcohol to lead to a positive experience, they would not be likely to have difficulty with impulse control in inhibiting their drinking behaviour. Even so, impulsivity scores have been positively related to alcohol consumption by undergraduates (Hair & Hampson, 2006) and binge drinking (Goudriaan, Grekin, & Sher, 2007). Impulsivity therefore appears to be a complex multidimensional construct that is difficult to define and measure but equally important to risky behaviours. As such, it is a variable of interest when considering decisions to binge drink (Churchill et al., 2008). For this reason, impulsivity could contribute to the prediction of health related behaviours, specifically binge drinking, over and above an extended TPB model. Choosing the right measure for this construct will be key and the following section will discuss some of the many options available, some strengths and weaknesses of the different approaches and why one may be a better option over others for measuring impulsivity in regards to binge drinking behaviour and the TPB.

5.2.2.2 Measuring impulsivity

Impulsivity has been measured using a wide variety of instruments. These have included self-report personality questionnaires and behavioural tasks with each having been further broken down into separate components thought to represent different underlying processes such as sensation seeking and urgency (Reynolds et al., 2006). Many of the available studies have shown little to modest interrelationships between measures of impulsivity suggesting that the construct is complex and multidimensional and is unlikely to be captured by a single measurement paradigm (Olson, Schilling, & Bates, 1999).

Table 5.3 – *Impulsivity scales: key features of available measures*

Scale	Author	Items	Reliability	Measures
I-7 Impulsiveness Questionnaire	S. B. Eysenck, Eysenck, and Barrett (1985)	54	.81	Impulsiveness, empathy and venturesomeness
Functional and dysfunctional impulsivity scales	Dickman (1990)	11/12	.79/.85	Functional and dysfunctional impulsivity
Personality Research Form Impulsivity Scale	Jackson (1984)	16	.85	Restraint
EASI-III Temperament Survey (subscale)	Buss and Plomin (1975)	20	.72	Inhibitory control, decision time, sensation seeking and persistence
Multidimensional Personality Questionnaire (subscale)	Tellegen (1982)	24	.82	Control and impulsiveness
Tridimensional Personality Questionnaire (subscale)	Cloninger et al. (1991)	100	.62	Impulsiveness vs reflection and exploratory excitability vs stoic rigidity
BIS/BAS	Carver and White (1994)	24	.84	Motor, cognitive and non-planning impulsiveness, behavioural activation/inhibition
UPPS Impulsive Behaviour Scale (4 subscales)	Whiteside and Lynam (2001)	11/13/12/10	.87/.89/.85/.83	Urgency, lack of premeditation, lack of perseverance and sensation seeking

Table 5.3 displays information about some of the available impulsivity scales including the author, number of items, the reliability of each scale (and the subscales if applicable) and what dimension of the construct each aimed to measure. Impulsivity subscales as part of larger personality inventories are also included. The use of any particular impulsivity measure should consider the types of dimension that are assessed (e.g. carefree attitudes and behaviours or a tendency to be disorganised).

A few of the measures used in previous research like the Behavioural Approach and Inhibition Systems or BIS/BAS (Carver & White, 1994; J. Gray, 1976, 1990), Tridimensional Personality Questionnaire or TPQ (Cloninger et al., 1991) and the UPPS impulsive behaviour scale (Whiteside & Lynam, 2001) have attempted to incorporate several aspects of impulsivity. The BIS/BAS was used in previous work with binge drinking and the TPB (Howard, 2011) and was not found to be predictive of binge drinking intentions nor behaviour therefore will not be used again in this study. It was possible that the BIS/BAS did not fully cover the multifaceted nature of impulsivity and there was a need to assess impulsivity through a more inclusive measure. The UPPS, for example, consists of four distinct measurements of impulsivity including urgency, lack of premeditation, lack of perseverance, and sensation seeking. Urgency referred to an individual's tendency to give into strong impulses when distressed; lack of premeditation reflected an individual's tendency to give little attention to the potential outcomes of behaviour; lack of perseverance described an individual's tendency to be easily distracted; and sensation seeking captured an individual's preference for excitement and stimulation. This particular measure of impulsivity has been explored alongside the TPB and shown to enhance the predictive utility of the model when predicting behaviours (e.g. healthy eating) that were not characterised by careful decision making strategies (Churchill et al., 2008). The subscale *urgency* has explained variance over and above an extended TPB model at least for snacking behaviour (Churchill et al., 2008). Whiteside, Lynam, Miller, and Reynolds (2005) provided support for the UPPS and the use of the four-factor model as it may provide insight into which of the personality traits may predispose individuals to risky behaviours. Because the UPPS has shown some promise in previous research with the TPB and risky behaviours, it will be the impulsivity measure used in this research to explore how impulsivity may play a role in decisions to binge drink.

5.2.3 Social Identity Theory

As discussed earlier in section 4.3, Social Identity Theory (SIT) is a theory of group processes and intergroup relations distinguishing group phenomena from interpersonal phenomena. According to Abrams and Hogg (1999) an important component of the self-concept is derived from memberships in social groups and categories where individuals define and evaluate themselves in terms of a self-inclusive social category. There is also the need to enhance the differences between the in-group and out-group while bolstering the similarities among the self and in-group members

on stereotypic dimensions in order to increase group belonging (K. Johnston & White, 2003). There has been a lack of strong support for subjective norms in attitude-behaviour studies and this may have been attributable to the role of norms in this context not being clearly theorised. It could be that subjective norm may be an inadequate measure to capture the impact of social influence on behaviour (Hogg & Reid, 2006; Terry & Hogg, 1996; Terry et al., 1999). As such, consideration of the effects of group membership on behaviour as outlined by SIT may provide a more comprehensive explanation of the role of social influence relating to norms (K. Johnston & White, 2003). Adolescents often engage in behaviours that are risky such as binge drinking and these behaviours could be aimed at constructing a distinctive, favourable and adaptive social identity and sense of self in the face of uncertainty (Hogg, Siegel, & Hohman, 2011). A key way of ‘finding oneself’ could be to identify with a group of people which involves perceiving self and others in terms of group prototypes – sets of attitudes and behaviours that define a group, differentiate it from other groups, and prescribe how group members should think, feel and act (Grant & Hogg, 2012). They may adopt in-group normative behaviours and a stronger self-identity involving group prototypes. Self-identity refers to the salient part of an individual which relates to a particular behaviour (Conner & McMillan, 1999). Sparks and Shepherd (1992) found self-identity as a green consumer to predict intentions to consume organically grown vegetables independently of other TPB variables. This strong need to identify with a group could lead to participating in risky behaviours in order to be included as a member in a particular group (e.g. undergraduates). This could mean, for example, that if an individual identifies strongly with a UEA undergraduate identity or considers binge drinking a key normative group behaviour (group norm), they would be more likely to participate in binge drinking. Social identity constructs such as UEA identity, group norms and self-identity then should explain additional variance above that of the TPB by predicting intentions to binge drink and addressing the issues of weaker normative influence on behaviour such as subjective norms. Therefore these measures of social identity were used in this research to gain an understanding of whether identity played a role in undergraduates’ decisions to binge drink over a one week period.

5.2.4 Descriptive norms

As discussed previously in section 4.2.3, descriptive norms could be a useful addition to the TPB model. They have been defined as what significant others do regarding their actual or perceived behaviour. In the case of binge drinking descriptive norms would be for example whether peers, parents or best friends binge drink and are based largely on observations of how people consume alcohol in discrete drinking situations (Borsari & Carey, 2003). The subjective norms component of the TPB is also considered a type of injunctive social norm because it is concerned with the perceived social pressure (what significant other think the person ought to do) whereas descriptive norms refer to the perceptions of significant others’ own attitudes and behaviours in the domain (Rivis & Sheeran, 2003). It has been suggested that adolescence is associated with heightened

sensitivity to social influence (Pasupathi, 1999) and a key life task during this stage is establishing one's identity through processes like seeking information and guidance from peers (Erikson, 1994; Sebald, 1989). This may make descriptive norms more salient to young people and may be more important in motivating decisions to engage in risky health behaviours (like binge drinking) than health promoting behaviours (Rivis & Sheeran, 2003). Young people typically overestimate peer approval of binge drinking and peer binge drinking behaviour leading to a belief their own drinking may be less risky than their peers (Larimer et al., 2004). This misperception could be leading young people to drink at riskier levels and some evidence has shown that normative campaigns educating young people on actual peer behaviour could be effective at reducing risky levels of drinking (Larimer et al., 2004).

Table 5.4 – *Studies of the relationship between descriptive norms and behavioural intentions.*

Authors	Behaviour	Sample	Measures	N	Effect size
Rivis and Sheeran (2003)	Binge drinking	Undergraduate students	Significant other's binge drinking	183	.70
Conner and McMillan (1999)	Cannabis use	Undergraduates	Best friend and family's cannabis use	249	.56
Donald and Cooper (2001)	Cannabis and ecstasy use	Undergraduate students	Friends' (from home and university) cannabis and ecstasy use	130	.62
Grube, Morgan, and McGree (1986)	Cigarette smoking	Primary school children	Mother, father, best friend and other friends' cigarette use	752	.29
McMillan and Conner (2003a)	Illicit drug use	Undergraduate students	Best friend and family's illicit drug use	494	.62
White, Terry, and Hogg (1994)	Condom use	Undergraduates	Significant others' condom use	211	.56
Conner, Martin, Silverdale, and Grogan (1996)	Dieting	Early and pre-adolescents	Best friend's dieting	231	.41

The effect size describes the direction and strength of the relationship between descriptive norms and behavioural intentions with a range of -1.0 and 1.0.

Table 5.4 was drawn from Rivis and Sheeran (2003) and shows the characteristics and effects sizes obtained from various studies of the descriptive norm-intention relationship including the authors,

sample, and health behaviour measured. Descriptive norms have been shown to be related to one's own drinking behaviour (Perkins, Meilman, Leichliter, Cashin, & Presley, 1999) and has been suggested to be predictive of one's future drinking behaviour (Sher, Bartholow, & Nanda, 2001). Descriptive norms have been used in TPB research to address the comparative weakness of the subjective norm-intention relation (Armitage & Conner, 2001) and we expect it to independently explain additional variance beyond the traditional TPB model through predicting intentions to binge drink.

5.2.5 Summary of expanding the TPB

In summary, using the theory of planned behaviour as a tool to understand the decision making process to binge drink could be useful but some variance in predicting behavioural intentions may be left unexplained (Ajzen, 2011). Additional variables have been explored in previous research to address this issue and some have been found to be effective with health and ingestive behaviours such as habit, impulsivity, social identity and descriptive norms. Habit has been an important predictor of behaviour as it has shown when a behaviour is performed often and repeated, the action then requires little conscious thought and becomes more automatic (Norman, 2011). This automatic aspect of behaviour is not covered by the TPB which assumes deliberative conscious thought when making decisions. This is what makes habit a valuable addition to the model. Impulsivity, associated with the inability to wait, has also been an important part of personality to add to the TPB as it has been positively correlated with risky behaviours such as binge drinking (Churchill et al., 2008). Impulsivity may encompass individual differences and personality which may help contribute to explaining additional variance above and beyond that of the TPB. Social identity has sometimes been used within the TPB to explore additional normative influences as well as how group membership may impact the decision making process to binge drink (K. Johnston & White, 2003; Terry et al., 1999). Finally, descriptive norms have been used to address criticisms of the subjective norms measures as they seek to capture the influence of significant others' perceived/actual behaviour (Rivis & Sheeran, 2003). This first study will employ the TPB with the additions of habit, impulsivity, social identity and descriptive norms to understand the decision making process of undergraduate students at UEA to binge drink. It was expected that attitudes, perceived behavioural control and subjective norms would predict intentions to binge drink and in turn for intentions to predict self-reported binge drinking behaviour. It was also expected that the added variables would explain additional variance above that of the TPB variables showing that habit, impulsivity, social identity and descriptive norms played some role in explaining binge drinking behaviour in young people.

5.2.6 Central research questions

The aim overall was to evaluate the extent to which an expanded TPB could predict and explain self-reported binge drinking intentions and behaviour.

5.2.6.1 Hypotheses

1. The basic TPB variables (attitude, subjective norms and PBC) with the additional variables (habit, impulsivity, social identity and descriptive norms) will predict intentions to binge drink in the next week, measured at time 1.
 - a. Positive attitudes will be independently predictive of greater intentions to binge drink in the next week.
 - b. Increased subjective norms will be independently predictive of greater intentions to binge drink in the next week.
 - c. Greater PBC will independently predict greater intentions to binge drink in the next week.
 - d. Higher habit scores will be independently predictive of greater intentions to binge drink in the next week.
 - e. Increased impulsivity levels (lack of premeditation, urgency, sensation seeking and lack of perseverance) will independently predict greater intentions to binge drink in the next week.
 - f. Greater UEA identity will be independently predictive of greater intentions to binge drink in the next week.
 - g. Higher group norms scores will be independently predictive of greater intentions to binge drink in the next week.
 - h. Stronger self-identity as someone who binge drinks will be independently predictive of greater intentions to binge drink in the next week.
 - i. Descriptive norms will independently predict intentions to binge drink in the next week.
2. TPB measures (intentions and PBC) with the additional variables of habit and impulsivity will predict self-reported binge drinking behaviour measured at time 2.
 - a. Greater intentions to binge drink in the next week will independently predict increased self-reported binge drinking behaviour measured at time 2.
 - b. Greater PBC will independently predict increased self-reported binge drinking behaviour measured at time 2.
 - c. Higher habit scores will independently predict increased self-reported binge drinking behaviour measured at time 2.
 - d. Higher impulsivity levels (lack of premeditation, urgency, sensation seeking and lack of perseverance) will independently predict increased self-reported binge drinking behaviour measured at time 2.

5.3 Methods

5.3.1 Participants

An opportunistic sample of 229 undergraduate students from the University of East Anglia took part in the time 1 online questionnaire and 168 took part in the time 2 online behaviour questionnaire (one week after time 1), a retention rate of 73%. The undergraduates were recruited through SONA, email and social media. The students were at least 18 years of age and included both male (n=68) and female (n=161) undergraduate students at UEA. The mean age for the participants was 20.51 years (SD = 3.28), median of 20, mode of 19 and 70.3% were female and 29.7% were male.

5.3.2 Design

Data was gathered in a prospective correlational study with time 1 and time 2 being 1 week apart. The study was ethically approved by the School of Psychology UEA Ethics Committee. The data were analysed using PASW (SPSS) 18. The study was run during the spring term of 2013 (from February to April). The dependent variables were intentions to binge drink, attitude, subjective norms, PBC, habit, impulsivity, social identity and descriptive norms. There were no independent variables.

5.3.3 Materials

The time 1 online questionnaire which consisted of demographics (e.g. age, gender, year of study), components of the theory of planned behaviour (behavioural intentions, attitudes, subjective norms and perceived behavioural control), habit, impulsivity, social identity and descriptive norms in relation to binge drinking was available on SurveyMonkey. All measures, excluding demographics, were measured on a 7-point Likert scale. The participants were asked to select one of 7 bubbles corresponding to the labels (numbers 1-7 with scale labels at either end) above it indicating their answer. The time 2 questionnaire assessing self-reported binge drinking behaviour one week later was also available on SurveyMonkey. See Appendices B and C for a full copy of the time 1 and time 2 questionnaires. Examples of the consent forms, briefing sheets, debriefing sheets and recruitment flyer can be found in Appendices G, F, H and A respectively.

5.3.3.1 Behaviour

At time two, one week after the first questionnaire, similar to K. Johnston and White (2003), the participants completed measures about their drinking behaviour during the prior week such as, "I participated in a binge drinking session in the last week; definitely no (1-7) definitely yes." A combination of five, 7-point Likert-type questions (numbers 1-7 with labels at either end) and two numerical-answer questions were used. The numerical-answer questions asked how many times

the participant drank under the binge drinking limit and how many times they drank more than the limit. Two items regarding whether the participant drank alcohol in the last week but less than the binge drinking limit (I drank alcohol in the last week but not more than 4/5 alcoholic drinks in a single session: definitely no/definitely yes; and In the last week, I stopped drinking before I was drunk: definitely no/definitely yes) were excluded from the scale during analysis as removing them improved the reliability of the self-report binge drinking behaviour measure. The Cronbach's alpha for the behaviour scale was .89 and a higher behaviour score indicated greater occurrence of binge drinking in the previous week.

5.3.3.2 Intention

Intentions were measured using nine items with a 7-point Likert-type scale similar to Cooke et al. (2007). Some examples of the items include: 'I intend to participate in at least one binge drinking session in the next week (strongly agree - strongly disagree)'; 'I would like to binge drink in the next week (definitely no - definitely yes)'; and 'In the next week do you intend to stop drinking before you are drunk (definitely no - definitely yes).' The item 'I plan to drink less than 4/5 alcoholic drinks in a single session in the next week (definitely agree - definitely disagree)' was excluded from the scale as the inter-item correlations were low and the alpha was improved by its removal. The Cronbach's alpha for the intentions scale with the eight remaining items was .95 and higher scores were indicative of greater intentions to binge drink in the next week.

5.3.3.3 Attitude

Attitudes were measured by ratings on five 7-point semantic differential scales as in McMillan and Conner (2003b). The students were asked to indicate how they felt about drinking alcohol on the following bipolar dimensions: bad to good, unpleasant to pleasant, unenjoyable to enjoyable, foolish to wise and harmful to beneficial. The Cronbach's alpha for this scale was .88 and higher scores were indicative of more positive attitudes towards binge drinking.

5.3.3.4 Subjective Norm

Subjective norms were measured similar to McMillan and Conner (2003b) by asking the students to indicate to what extent the person they considered to be their best friend, those who were important to them and whose opinions they valued approved of their drinking alcohol on a 7-point scale. They also rated the importance they placed on the opinions of their best friends and those who were important to them (1 = not at all important, 7 = very important) though these were not included in the subjective norms scale. The Cronbach's alpha for the scale was .73 and higher scores were indicative of greater normative support or perceived approval of binge drinking from best friends and significant others.

5.3.3.5 Perceived Behavioural Control

Perceived behavioural control was assessed by three items with a 7-point Likert-type scale measuring the students' perception of control over participating in a binge drinking session in the next week as in Williams and Hine (2002). 'Whether I do or do not binge drink is entirely up to me'; 'How much control do you feel you have over binge drinking in the next week?'; 'I would like to binge drink in the next week but I don't really know if I can.' The third item was excluded from the scale as the alpha was significantly improved by its removal. The Cronbach's alpha for PBC was .81 and higher scores were indicative of greater perceived control over binge drinking in the next week.

5.3.3.6 Habit

Habit was measured using the Self-Report Habit Index as in Gardner et al. (2012). It included twelve items using a 7-point Likert scale relating to three characteristics of habitual action where the participants rated their (dis)agreement: automaticity (e.g. [Binge drinking is something...] I have no need to think about doing), frequency (e.g. ...I do frequently), and relevance to self-identity (e.g. ...that's typically me). The Cronbach's alpha for habit was .94 and higher habit scores indicated greater binge drinking habit strength.

5.3.3.7 Impulsivity

Impulsivity was measured using the 45 question UPPS impulsive behaviour scale which consisted of four subscales: urgency (12 items), lack of premeditation (11 items), lack of perseverance (10 items), and sensation seeking (12 items) with a Likert-type 7-point scale (Whiteside & Lynam, 2001). The Cronbach's alphas for urgency was .92 and higher score indicated a greater tendency to give into strong impulses when distressed. The Cronbach's alphas for lack of premeditation was .93 and higher score indicated a greater tendency to give little attention to the potential outcomes of behaviour. The Cronbach's alphas for lack of perseverance was .87 and higher score indicated a greater tendency to be easily distracted. Finally, the Cronbach's alphas for sensation seeking was .91 and higher score indicated a greater preference for excitement and stimulation.

5.3.3.8 Social identity

The social identity constructs were measured through UEA identification, group norms and self-identity. These constructs are discussed in more detail in the following sections.

5.3.3.8.1 UEA identification and group norms

UEA identification (13 items) and group norms (12 items) were assessed using measures adapted from K. Johnston and White (2003) such as: ‘How much do you feel you identify with other UEA students?’; ‘With respect to your general attitudes and beliefs, how similar do you feel you are to other UEA students?’; ‘Is drinking alcohol something university students do often?’; and ‘In general, how well do you feel you fit in with other UEA students.’ All items were measured on a 7-point scale ranging from 1-7 with labels at either end. The Cronbach’s alpha for UEA identity was .93 and higher UEA identity scores indicated stronger identification as a UEA undergraduate. The Cronbach’s alpha for group norms was .85 and higher group norms scores indicated greater perceptions that binge drinking was part of being a typical university student.

5.3.3.8.2 Self-identity

Self-Identity was measured using 2 items adapted from Hagger and Chatzisarantis (2006): “Drinking more than 4/5 alcoholic drinks in a single session in the next week is an important part of who I am”; and “ I think of myself as the type of person who would drink more than 4/5 alcoholic drinks in a single session in the next week”. Both of these used a 7-point scale ranging from 1 to 7. The Cronbach’s alpha for self-identity was .81 and higher self-identity scores indicated stronger identification as someone who binge drinks.

5.3.3.9 Descriptive norms

Descriptive norms were measured using 2 items adapted from Ravis and Sheeran (2003) using a 7-point Likert scale. The 2 items were: ‘How often does your best friend have at least one drink of alcohol in a week?’ and ‘How often does your best friend binge drink in a week?’ The Cronbach’s alpha for descriptive norms was .77 and higher scores indicated greater perceptions of binge drinking as a peer normative behaviour.

5.3.4 Procedure

After following the link provided on a flyer, poster or website, the participants were taken to an information screen explaining instructions, providing information about the researcher, the study, the participant rights and a definition of binge drinking alongside a brief drinks guide to units included in various well known drinks. Examples of all of these materials are included in the Appendices. They then chose ‘continue’ at the bottom of the page to take part or closed the window to exit.

The participants selecting ‘continue’ were taken through to complete the electronic questionnaire. At the bottom of each screen the participants chose ‘next’ to continue or ‘back’ to move to a

previous page. They were free to move backwards and forwards through the questionnaire and all questions were optional. Participants could have chosen to leave some of the questions unanswered. This did not keep them from submitting when they finished. Upon reaching the end of the questionnaire, the participants were taken to a screen stating that if they are happy with the data they had provided to be used then they should select 'submit' but that if they did not wish to submit their data they could exit by closing the window. After selecting 'submit' the participants were taken to a debriefing screen separate from the questionnaire, thanking them for participation and provided information about safe drinking practice and sources of support for any who may be concerned about alcohol use. The participants were also asked to provide an email contact to receive a reminder 24 hours in advance of the time-2 questionnaire. The reminder email contained the link to the time-2 questionnaire. They were explicitly informed that completion of both time 1 and time 2 questionnaires was required in order to be entered into the prize draw and that any contact information provided by them would be stored separately from the data and destroyed after the reminder message had been sent. The time one questionnaire took approximately 30 minutes to complete. One week after completing the first questionnaire, the participants followed the link for the time-2 questionnaire provided to them via email and procedures were the same as time 1. The time-2 questionnaire took approximately 5 minutes to complete. A comment section was made available on both time 1 and time 2 questionnaires for the participants to ask questions, express concerns or to simply make a statement. After finishing the time 2 questionnaire, the participants were taken to a prize draw entry form separate from the questionnaire where they could provide their email for entry if they chose.

Those choosing to participate were able to complete the time 1 questionnaire any time before 19th April 2013. Only those providing contact details at time 1 were provided the link for the time-2 questionnaire in the email reminder. All time 1 data was used in the prediction of intentions to binge drink in the next week and the data for time 2 was used in predicting binge drinking behaviour. Using the emails provided during the time-2 questionnaire, a randomly selected participant was drawn to win 100 pounds of Amazon vouchers. A participant was only eligible for the prize draw if they had completed both time 1 and time 2 questionnaires. This rule was clearly stated to the participants before they took part in any of the research. The draw took place on 1st May 2013. The winner was contacted and arrangements were made to collect their prize. After collection, all contact details for all participants were deleted. Electronic data was password protected and was stored on a memory stick in a locked filing cabinet in a restricted access room in Elizabeth Fry Building.

5.4 Results

5.4.1 Overview of results

This section describes the results in relation to variables predicting intentions to binge drink and binge drinking behaviour. Preliminary analysis were carried out to account for missing and outlying data before conducting correlations and regression analysis. Results have been reported in order of hypotheses listed. Descriptive and correlational data of the measures are discussed and are shown in table 5.5 and 5.6. Correlations among the TPB components, habit, impulsivity and social identity components are shown in table 5.7. Data pertaining to the predictive utility of the TPB is presented followed by an examination of the extent to which the predictive utility of the TPB was affected by including measures of descriptive norms, habit, impulsivity and SIT. Multiple hierarchical forced entry linear regressions of attitudes, subjective norms, PBC, habit, impulsivity and social identity onto intentions and intentions onto self-reported binge drinking behaviour are presented (shown in tables 5.8 and 5.9). This was done in line with previous research entering the variables in prescribed steps (Churchill et al., 2008; Norman & Conner, 2006).

5.4.2 Preliminary analysis

Before collecting data, power analysis was conducted to determine the sample size. For TPB studies using multiple regression, this has been an accepted method for determining sample size and it suggested an n of 80 as sufficient (Cohen, 1988). But, response rates could have approached 50% and for this reason the recruitment goals were to collect data for 200 participants at time 1. At time 1, the sample included 229 participants and with an attrition rate of 27% time 2 retained 168 participants.

Tests for normal distribution were run using skewness and kurtosis values (included in Appendix D), assessments of visual aids such as graphs and data were checked for outliers. Outliers were found for PBC with some reporting lower perception of control over binge drinking than most but this should not be considered abnormal or out of the realm of possibility in terms of the way the scale was measured on a Likert-type scale. Most variables were normally distributed with the exceptions of intentions, PBC and self-identity. Intentions, with a z -score of kurtosis = -3.62, had a flat light-tailed distribution. PBC, with a z -score of kurtosis = 4.99 and a z -score of skewness = -9.68, had a heavy-tailed distribution with a build-up of higher scores suggesting reporting of greater control over binge drinking in the next week. Self-identity, with a z -score of skewness = 3.93, had a build-up of lower scores suggesting less self-identification as someone who binge drinks. Some consideration should be given to the larger sample size (200+) as it likely produced small standard errors which could have resulted in the significant values from even small deviations from normality (Field, 2013).

To examine collinearity diagnostics, convergent validity of measures were assessed by examining inter-correlation of items measuring the same variable (see table 5.6 for Cronbach's alpha of all

the variables). For discriminant validity of variables it was important to ensure the correlations did not exceed $r=.85$ as this could have indicated definitional overlap of concepts (Borsboom, Mellenbergh, & van Heerden, 2004). This boundary has been considered a functionally sufficient test of discriminant validity (Bertea & Zait, 2011) and all variables met these requirements (see table 3.2 for correlations).

Options were explored to transform the data into a normal distribution using Log transformations (Field, 2013) but this was ineffective at changing the distribution of the data. Regression analysis was conducted with the original untransformed data.

To determine if there were significant differences between those participants completing both time 1 and time 2 questionnaires and those only taking part in time 1, independent samples t-tests were run to identify any significant mean differences between the groups. The results, shown in Table 5.5, showed no significant differences in means across all variables measured.

Table 5.5 - Differences between participant groups completing Time 1 and those completing Time 1 and Time 2

<i>Variable</i>	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>	<i>Mean Diff</i>	<i>Std. Error Diff</i>
<i>Intentions</i>	-.450	214	.653	-.11972	.26610
<i>Attitude</i>	-.645	215	.520	-.13596	.21093
<i>SN</i>	.949	219	.344	.17251	.18176
<i>PBC</i>	.821	226	.413	.14079	.17149
<i>Habit</i>	-1.551	215	.122	-.35777	.23067
<i>Imp – pre</i>	-.567	219	.571	-.100	.176
<i>Imp – urge</i>	-.635	220	.526	-.120	.189
<i>Imp – ss</i>	-.758	217	.449	-.156	.206
<i>Imp – per</i>	-1.520	218	.130	-.226	.149
<i>UEA ID</i>	.772	217	.441	.13382	.17343
<i>Group norms</i>	-1.019	213	.309	-.11658	.11438
<i>Self-identity</i>	-1.675	224	.095	-.40447	.24153

5.4.3 Descriptive data

Table 5.6 shows the means, standard deviations and Cronbach's alphas for all variables. All scales had alphas above .70. A higher proportion of participants had intentions to binge drink in the next week. Overall, participants reported somewhat neutral explicit attitudes towards binge while subjective norms scores with regards to binge drinking were above the scale mid-point of 3.5 suggesting there were slightly greater perceived approval from significant others of respondents' binge drinking behaviour. Participants reported having high perception of control over binge drinking in the next week and binge drinking habit scores were low suggesting fewer participants reported binge drinking often.

Table 5.6 - Means, standard deviation and Cronbach's Alphas for all variables

	Alpha	Mean	SD	
Behaviour	.89	2.7	1.5	(BEH1-3, BEH6-7)
Intentions	.95	3.7	1.8	(INT1-6, INT8, INT9)
Attitude	.88	3.4	1.4	(ATT1-ATT5)
Subjective Norms	.73	4.0	1.3	(SN1, SN5, SN6)
PBC	.81	6.2	1.2	(PBC1 & 2)
Habit	.94	2.9	1.6	(HAB1-12)
Imp – Premeditation	.93	4.7	1.2	(IMPpre1-11)
Imp – Urgency	.92	3.4	1.3	(IMPu1-12)
Imp – Sens Seeking	.91	4.4	1.4	(IMPss1-12)
Imp – Perseverance	.87	4.7	1.0	(IMPpers1-10)
UEA Identity	.93	4.6	1.2	(GI1-13)
Group Norms	.85	5.5	0.8	(GN1-12)
Self-Identity	.81	2.8	1.7	(SI1, SI2)
Descriptive Norms	.77	4.5	1.7	

Three of the impulsivity subscales had scores that were high (lack of premeditation, sensation seeking and lack of perseverance) showing greater tendency to give little attention to the potential outcomes of behaviour, to be easily distracted and preference for excitement and stimulation. The impulsivity subscale of urgency was just below the scale mid-point suggesting participants were

more likely to only sometimes have tendencies to give into strong impulses when distressed. UEA student identity was high showing participants identified more strongly as a UEA undergraduate. Binge drinking as part of group norms was high meaning binge drinking was perceived as a more normative behaviour for undergraduates. Self-identity scores were much lower suggesting participants were less likely to report binge drinking as something that was part of who they were. The undergraduates also reported stronger descriptive norms regarding binge drinking indicating they thought significant others were more likely to binge drink.

5.4.4 Correlations of variables

Table 5.7 features the bivariate correlations among the variables of interest (behaviour, intentions, attitudes, subjective norms, PBC, habit, impulsivity, UEA identity, group norms, self-identity and

Table 5.7 - *Bivariate correlations for self-reported binge drinking behaviour, TPB components (intentions, attitude, subjective norms and perceived behavioural control), habit, impulsivity (lack of premeditation, urgency, sensation seeking and lack of perseverance), UEA identity, group norms, self-identity, and descriptive norms.*

	Int	Att	SN	PBC	Habit	Imp-Pr	Imp-U	Imp-SS	Imp-Pe	UEA-I	GN	SI	DN
Beh	.68**	.51**	.40**	-.25**	.61**	.10	.36**	.23**	-.14	.22**	.19*	.56**	.36**
INT		.65**	.45**	-.19**	.57**	-.26**	.25**	.40**	-.09	.42**	.19**	.67**	.38**
ATT			.47**	-.16*	.35**	-.09	.16*	.21**	.01	.31**	.15*	.50**	.27**
SN				-.17*	.40**	-.15*	.14*	.22**	-.07	.23**	.22**	.41**	.44**
PBC					-.32**	.09	-.46**	-.20**	.07	.01	-.12	-.37**	-.16*
HAB						-.27**	.50**	.30**	-.13	.26**	.23**	.73**	.44**
Imp-Pr							-.14*	-.38**	.32**	-.27**	.10	-.21**	-.01
Imp-U								.16*	-.25**	.03	.23**	.45**	.29**
Imp-SS									.04	.24**	.13	.36**	.17*
Imp-Pe										.04	.00	-.17*	-.06
UEA ID											.08	.38**	.16*
GN												.21**	.25**
SI													.38**

** . Correlation significant at the 0.01 level (2-tailed)

* . Correlation significant at the 0.05 level (2-tailed)

descriptive norms). Attitude ($r = .65, p < .01$) subjective norms ($r = .43, p < .01$) and PBC ($r = -.19, p < .01$) all correlated with intentions to binge drink as the theory proposed. Intentions, attitude, subjective norms, PBC, habit, some components of impulsivity (urgency and sensation seeking) and all social identity constructs were correlated with binge drinking behaviour ($p < .05$). Intercorrelations among these variables were also present, although they ranged from small effect size associations (PBC and attitudes) to large associations (habit and intentions).

5.4.5 Predicting binge drinking intentions – hypotheses 1

Forced entry hierarchical multiple linear regression analysis was used to predict intentions to engage in a binge drinking session over a week (Table 5.8). The variables were entered into five blocks similar to K. Johnston and White (2003) to assess each construct's individual contribution to the model. The five steps were: (1) attitude, subjective norms and PBC, (2) habit, (3) impulsivity (premeditation, urgency, sensation seeking and perseverance), (4) social identity (UEA identity, group norms and self-identity), and (5) descriptive norms. The TPB variables were able to explain 46% of the variance in binge drinking intentions (adjusted $R^2 = .45, F(3, 158) = 44.34, p < .001$).

Table 5.8 - Predicting binge-drinking intentions using TPB variables, habit, impulsivity, social identity and descriptive norms ($N=229$).

Step	Variable	Beta				
		Step 1	Step 2	Step 3	Step 4	Step 5
1	Attitude	0.59***	0.50***	0.50***	0.41***	0.40***
	SN	0.14*	0.07	0.05	0.02	0.02
	PBC	-0.05	0.04	0.06	0.06	0.06
2	Habit		0.38***	0.32***	0.15	0.14
3	Imp – Pre			-0.06	-0.06	-0.07
	Imp – Urg			0.00	0.00	0.00
	Imp – SS			0.16**	0.11	0.11
	Imp – Pers			-0.05	-0.05	-0.05
4	UEA ID				0.13*	0.12*
	GN				0.05	0.05
	SI				0.27**	0.27**
5	DN					0.02
R ² Adjusted		0.447	0.556	0.581	0.632	0.629
R ² Change		0.46***	0.11***	0.04**	0.06***	0.00

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

Attitudes and subjective norms had significant beta scores. The addition of habit in step 2 produced a significant increase in the amount of variance explained (adjusted $R^2 = .56$, R^2 change = .06, $F(4, 157) = 51.35$, $p < .001$) in binge drinking intentions to 56%. Attitude and habit had significant beta weights. The addition of the impulsivity components at step 3 produced a significant increase of 4% in the amount of variance explained (adjusted $R^2 = .60$, $F(8, 153) = 28.96$, $p < 0.001$). Attitude and habit maintained a significant beta weights and the impulsivity subscale sensation seeking was predictive of intentions to binge drink in the next week.

The addition of the social identity variables at step 4 significantly added 6% (R^2 change = .06) to the amount of variance explained in binge drinking intentions (adjusted $R^2 = .66$, $F(11, 150) = 26.10$, $p < .01$) while habit and sensation seeking no longer maintained a significant beta weights. At step 5, descriptive norms did not explain additional variance in intentions to binge drink in the next week. Together the variables under consideration were able to explain 66% of the variance in binge drinking intentions (adjusted $R^2 = .63$, $F(12, 149) = 23.80$, $p < .001$). Attitudes towards binge drinking were predictive of intentions to binge drink. UEA identity and self-identity were predictive of intentions to binge drink. This was supportive of the hypotheses: components of the TPB (attitude, subjective norms and PBC) would be predictive of binge drinking intentions; the addition of habit would account for additional variance in behavioural intentions at time 1 over and above the contribution of attitude, PBC and subjective norms; and the addition of identity variables would account for additional variance in behavioural intentions at time 1 over and above the contribution of attitude, PBC, subjective norms and habit.

5.4.6 Predicting binge drinking behaviour – hypothesis 2

To assess predicting self-reported binge drinking behaviour at time 2, a second forced entry hierarchical multiple linear regression was performed shown in Table 5.9. The variables were entered into the regression similar to Norman and Conner (2006) with the variables in four blocks: (1) intentions, PBC, (2) habit, (3) impulsivity (premeditation, urgency, sensation seeking and perseverance), (4) attitude, subjective norms, UEA identity, group norms, self-identity and descriptive norms. At step 1, 46% of the variance was explained (R^2 adjusted = .45, $F(2, 110) = 47.43$, $p < .001$) though intentions was the only variable that significantly added to the model at this stage. At step 2, habit contributed an additional 6% to the amount of variance explained in self-reported binge drinking behaviour (R^2 adjusted = .51, $F(3, 109) = 40.19$, $p < .001$). Impulsivity in step 3 explained an additional 6% of the variance (R^2 adjusted = .55, $F(7, 105) = 20.98$, $p < .01$). Premeditation was the only subscale of impulsivity that was a significant predictor of behaviour. The remaining variables in step 4 did not contribute to the explained variance. Together the variables under consideration were able to explain 60% of the variance in binge drinking intentions. This supported the hypothesis that binge drinking intentions, impulsivity and habit would be predictive of binge drinking behaviour.

Table 5.9 - Predicting binge-drinking behaviour using TPB variables, habit, impulsivity, UEA identity, group norms, self-identity and, descriptive norms (N=168).

	Beta			
	Step 1	Step 2	Step 3	Step 5
1 Int	0.66***	0.47***	0.52***	0.48***
PBC	-0.10	-0.05	-0.03	-0.04
2 Habit		0.32***	0.33***	0.35**
3 Imp – Pre			0.22**	0.22*
Imp – Urg			0.08	0.07
Imp – SS			-0.04	-0.02
Imp – Pers			-0.03	-0.04
4 Att				0.12
SN				-0.01
UEA ID				-0.01
GN				-0.01
SI				-0.12
DN				0.06
R ² Adjusted	0.453	0.512	0.552	0.544
R ² Change	0.46***	0.06***	0.06**	0.02

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

5.4.7 Summary of results for an expanded TPB model

To summarise the results beginning with preliminary analysis, a goal of 200 participants was set and 229 participants were recruited. We saw a 27% attrition rate between time 1 and time 2, maintaining 168 participants. Most of the variables assessed were normally distributed with the exception of intentions, PBC and self-identity. Attempts to address the non-normally distributed data, such as log transformations (Field, 2013), were not effective therefore the original untransformed data were used in the analysis. All variables also met the boundary of $r = .85$ considered sufficient for testing discriminant validity and no significant differences were found between those completing only time 1 and those completing both time 1 and time 2. Scale reliability for all variables were high with Cronbach's alphas all about .70. The data showed a higher proportion of respondents had intentions to binge drink in the next week and most held relatively neutral attitudes towards binge drinking. There was greater perceived approval of participants' binge drinking from significant others and very high perceptions of control over binge drinking in the next week. Low binge drinking habit scores were found while we saw a greater tendency to give little attention to potential outcomes of behaviour, to be easily distracted

and greater preference for excitement and stimulation. Participants reported somewhat agreeing that they had tendencies to give into strong impulses when distressed. Regarding identity, we saw high UEA identity and group norms scores meaning the undergraduates identified quite strongly as a UEA undergraduate and saw binge drinking as a normative undergraduate behaviour. Self-identity scores were low suggesting fewer participants saw binge drinking as a part of their identity. Descriptive norms scores showed that significant others were more likely to drink. Attitudes, subjective norms and PBC were correlated well with intentions as the theory suggested while self-reported binge drinking behaviour was correlated with all variables except the impulsivity subscales of lack of premeditation and lack of perseverance. The TPB, specifically attitudes, significantly predicted intentions to binge drink with the additional variables of UEA identity and self-identity helping to explain additional variance. Self-reported binge drinking behaviour was predicted by intentions but not PBC. The variables of habit and impulsivity (premeditation) explained additional variance in binge drinking behaviour above that of the TPB variables.

5.5 Discussion

The present study applied an expanded theory of planned behaviour (TPB) containing separate measures of habit, impulsivity, social identity constructs and descriptive norms to the prediction of binge drinking intentions and behaviour among a sample of UEA undergraduate students over a 1-week period. Altogether, this study used a sample that was diverse in cultural, social and economic background even among the specific group of undergraduates at UEA. The findings of non-normal distribution in intentions, PBC and self-identity were likely due to the sample size where small deviations appeared significant as the model was quite robust. Though, another reason may be the nature of the questions asked where participants reported being very sure they intend to binge drink or not and sure they did binge drink or not one week later. This produced numbers at either end of the scales rather than a normal distribution. Therefore, analyses were run with intentions and behaviour data unaltered as transforming did not change the distribution. Attitudes were predictive of binge drinking intentions in the next week as hypothesised and the additional variables of UEA identity and self-identity explained variance above that of the traditional TPB variables. Binge drinking intentions was predictive of self-reported binge drinking behaviour alongside habit and the impulsivity subscale lack of premeditation.

5.5.1 TPB predicting binge drinking intentions

Looking at hypothesis 1 which was partially supported, the TPB was found to be predictive of intentions to engage in a binge drinking session over a week, explaining 46% of the variance in intention scores with attitudes emerging as a significant predictor. Attitudes and subjective norms (the theory of reasoned action) have accounted for 33% to 50% of the variance in intentions (Armitage & Conner, 2001; Beck & Ajzen, 1991) and the addition of perceived behavioural control has typically increased the explained variance in intentions by 5% to 12%. Earlier research

has shown attitude, subjective norms and PBC to be predictive of alcohol use intentions (Conner & Armitage, 1998; Conner, Warren, Close, & Sparks, 1999; McMillan & Conner, 2003b; Norman & Conner, 2006). The results of this study at 46% of explained variance in intention were somewhat higher than previous applications of the TPB which have found the TPB typically predicting between 19% and 38% of the variance (Rivis & Sheeran, 2003). This high percentage was likely due to the short time interval of 1 week as intentions change when time increases and you would expect to find intentions to be less predictive when asking about behavioural intentions two weeks, 6 months or a year in advance (Ajzen, 1985).

5.5.1.1 Attitudes predicting intentions – hypothesis 1a

In the current study, attitudes were the only variable in the TPB that significantly explained intentions supporting hypothesis 1(a). Previous studies (Cooke et al., 2007; K. Johnston & White, 2003; Norman & Conner, 2006) have shown attitudes to be a consistent predictor of intentions to binge drink. More positive attitudes towards binge drinking were positively associated with greater intentions to binge drink. Cooke et al. (2007) showed that attitudes to limit drinking are significantly linked to intention to limit drinking, however, most research that has often aimed at reducing binge drinking behaviour focused on reducing perceptions that heavy alcohol consumption was the norm (Campo et al., 2003) rather than focusing on changing the attitudes themselves. These results support a move towards looking at attitude change as a possible tool to reducing binge drinking intentions and behaviour.

5.5.1.2 Subjective norms predicting intentions – hypothesis 1b

Though there was evidence to support hypothesis 1(b) where participants with higher subjective norms scores had greater intentions to binge drink and in step 1 of the regression analysis subjective norms appeared as a significant predictor of intentions, in the larger model they did not appear as a significant predictor alongside the additional variables. This led to rejecting hypothesis 1(b) that subjective norms would be predictive of binge drinking intentions. Cooke et al. (2007) had similar findings and a meta-analysis by Armitage and Conner (2001) showed that the subjective norm-intention correlation was weaker than the attitude-intention and perceived behavioural control-intention relationships. This relationship between subjective norms and intentions may suggest intentions are influenced more primarily by personal factors, however, other evidence suggests that the narrow conceptualisation of the normative component in the TPB may be responsible for the attenuation of the subjective norm-intention relation (Armitage & Conner, 2001; Rivis & Sheeran, 2003).

5.5.1.3 PBC predicting intentions – hypothesis 1c

PBC did not appear as a significant predictor of binge drinking intentions rejecting hypothesis 1(c) but in most applications of the TPB to alcohol related studies, a negative relationship has been

found between PBC and intentions. This study also showed a negative relationship which suggested low perceptions of control may have been associated with strong alcohol-use intentions. This effect also appeared in both correlation and regression analyses, suggesting that it was not merely a statistical artefact (Conner and Norman, 2006). Though opposite in direction to that predicted by the TPB and found in many other applications, the negative relationship between perceptions of control and intentions was in line with other work which has suggested that problem drinkers may have a more external locus of control than non-problem drinkers (Donovan & O'Leary, 1978; Norman & Conner, 2006). In this context, it was possible that intentions to engage in binge drinking may have been the result of external pressures to drink over which the individual had less control (e.g. friend's going away party). Norman, Bennett, and Lewis (1998) reported that binge drinkers were more likely to cite a range of factors, such as celebrating an event and being at a party as important influences on their behaviour. Similarly, McMillan and Conner (2003b) found the perceptions of many facilitating factors and few inhibiting factors were related to stronger intentions to drink over the next six months. This could mean that collecting information surrounding each binge drinking occasion, such as reasons and location, using methods like a drinking diary or self-report could provide data about external influences of drinking behaviours and improve the control measurements in the TPB.

5.5.2 Additional variables predicting binge drinking intentions

5.5.2.1 *Habit predicting intentions – hypothesis 1d*

Habit strength significantly increased the amount of explained variance in binge drinking intentions by 6% supporting hypothesis 1(d). This was in line with other research showing habit strength having an additive effect in health related behaviours and intentions (de Bruijn et al., 2008; de Bruijn & Rhodes, 2011; Gardner et al., 2012). Those with higher habit strength had greater intentions to binge drink in the next week. When the identity constructs were added as part of the complete expanded model habit was no longer a significant predictor.

5.5.2.2 *Impulsivity predicting intentions – hypothesis 1e*

Impulsivity components explained an additional 4% of the variance in intention to binge drink in the next week with the impulsivity subscale sensation seeking appearing as a significant predictor showing limited support for hypothesis 1(e). Churchill et al. (2008) had similar findings and though they did not assess the role of impulsivity on intention, it was inserted as a variable into the model and urgency and sensation seeking added 8% to the explained variance in intentions to binge drink. For this study premeditation, urgency and sensation seeking were positively correlated with binge drinking intentions meaning more impulsive individuals were more likely to have higher intentions to binge drink. When considered as part of the larger model, sensation seeking was not predictive of binge drinking intentions which could indicate that some components of impulsivity may play a role in decisions to binge drink at some level but other

variables were more proximal determinants of intentions to binge drink in the next week. The research findings have a number of important theoretical implications. Mainly, that sensation seeking can predict intentions over and above the traditional TPB model which suggests that for some risky health behaviours, measures that assess the extent to which people act on impulse may be an important independent predictor of behaviour and intentions alongside other factors that reflect a more deliberative processing model.

5.5.2.3 Social identity predicting intentions – hypothesis 1f-1h

The social identity components UEA identity and self-identity were predictive of binge drinking intentions showing support for hypotheses 1(f) and 1(h). UEA identity and self-identity were important in the model after considering all other variables explaining an additional 6% of the variance in intention to binge drink. This suggested that how strongly undergraduates identified with their UEA undergraduate group and how strongly they identified as someone who binge drinks explained additional variance in intentions to binge drink above and beyond that of the TPB. Identity appeared to play an important role in binge drinking intentions and may be an important focus for interventions looking at altering identity or making alternative identities salient to affect intentions and possibly behaviour (Berger & Rand, 2008).

Existing research has emphasised the importance of normative variables in predicting binge drinking behaviour and intentions (K. Johnston & White, 2003). As mentioned above, only some weak evidence was found for subjective norms as predictors of intentions in this first study but additional group norms were assessed as well. The group norms component of the social identity construct also did not predict intentions rejecting hypothesis 1(g). This showed in a university context that whether students perceived binge drinking as part of an undergraduate normative behaviour did not significantly influence their intentions to binge drink directly. Group norms may have effected intentions and behaviour less directly possibly through UEA identity.

5.5.2.4 Descriptive norms predicting intentions – hypothesis 1i

Descriptive norms were added to the model to address the issue of an often weaker subjective norms component (Armitage & Conner, 2001; Sheeran & Orbell, 1999a) but no evidence was found to show that descriptive norms were predictive of intentions to binge drink leading to the rejection of hypothesis 1(i). This was in contrast to Ravis and Sheeran (2003) findings that descriptive norms contributed an additional 5% to the variance in intention after the traditional TPB variables have been taken into account which suggested that the descriptive norm construct warranted inclusion in the model. There may be reason to explore the relationship between group identification, descriptive norms and intention as some research has found that the relationship between descriptive norms and intentions was stronger for individuals that identified with a behaviourally relevant reference group (Terry & Hogg, 1996). More detailed research would need

to be done to draw meaningful conclusion about this relationship in the future as sample sizes were not large enough here to compare weak identifiers with strong identifiers.

5.5.3 TPB predicting binge drinking behaviour

5.5.3.1 Intentions predicting behaviour – hypothesis 2a

As predicted in hypothesis 2(a), intentions were predictive of self-reported binge drinking behaviour. Intention to binge drink in the next week explained 46% of the variance in self-reported binge drinking behaviour. Undergraduates intending to binge drink in the next week were more likely to participate in a binge drinking session than those not intending to do so. This was in line with previous research (Cooke et al., 2007; Norman, 2011; Norman et al., 1998; Norman & Conner, 2006; Todd & Mullan, 2011).

5.5.3.2 PBC predicting behaviour – hypothesis 2b

Hypothesis 2(b) was not supported with PBC not predicting binge drinking behaviour directly. This indicated that perception of control over whether the participants could binge drink or not in the next week did not explain a significant amount of variance in actual binge drinking behaviour. These findings were in line with previous research on the TPB and binge drinking (K. Johnston & White, 2003) where perceptions of control lacked predictive utility regarding behaviour. This may be due to perceptions of control influencing behaviour only via intentions and not directly (Terry & O'Leary, 1995)

5.5.4 Additional variables predicting binge drinking behaviour

5.5.4.1 Habit predicting behaviour – hypothesis 2c

When looking at binge drinking intentions above, habit strength was not predictive as part of the expanded model but the same was not true when considering self-reported binge drinking behaviour. Habit was predictive of binge drinking behaviour explaining an additional 6% of the variance upholding hypothesis 2(c). Though the habit construct was supported in this data, the practical application needs consideration. Previous studies have suggested that environmental aspects play a key role where habits are conceived (Aarts & Dijksterhuis, 2000; Verplanken & Aarts, 1999; Verplanken & Melkevik, 2008). It could be that drinking may be reinforcing for some if alcohol is readily available, reduces anxiety and boosts their confidence. Behavioural responses are often brought on by environmental cues and having a highly salient environment for binge drinking behaviours such as a party, a night out or friends who are drinking could be a very important factor to consider (de Bruijn & Rhodes, 2011).

5.5.4.2 Impulsivity predicting behaviour – hypothesis 2d

In line with Churchill et al. (2008) these findings suggested that some elements of impulsivity contributed to the prediction of binge drinking behaviour over and above an extended TPB model as in hypothesis 2(d). Lack of premeditation appeared as a significant predictor of binge drinking explaining an additional 6% in the variance of self-reported binge drinking behaviour. The data showed those scoring high on the impulsivity dimension lack of premeditation reported more binge drinking behaviour. Lack of premeditation remained a significant predictor throughout the model even after all constructs were considered as part of the model. The predictive utility of the TPB could be increased in future by including measures of impulsivity with the traditional TPB variables.

5.5.4.3 Residual effects on behaviour by remaining variables

The remaining variables including attitude, subjective norms, UEA identity, group norms, self-identity and descriptive norms were added to the regression analysis to test if there were residual effect on self-reported binge drinking behaviour. None of these explained a significant amount of additional variance in binge drinking behaviour which suggested that these variables' influence on behaviour was most likely through intentions.

5.5.5 Conclusions

Some elements of the theoretical framework were well supported by the data. Attitudes predicted intentions and in turn intentions predicted self-reported binge drinking behaviour. An important key section did fail to contribute as planned: PBC. As a key component of the TPB, it should have been a significant predictor of binge drinking intentions based on literature and was not. It did significantly correlate with intentions and may have appeared to be a non-significant contributor due to the methods of gathering the data or structuring of the online questionnaires. There also may be concerns regarding the theory itself considering elements such as PBC have been weak or non-significant predictors in a few studies. Like Cooke et al. (2007), the mean for PBC (6.17) was high and had a standard deviation of 1.2 which suggested a lack of variation in responses, and likely undermined the impact of PBC in analysis. It may be that for undergraduates, the availability of alcohol and control over participating in binge drinking occasions has less of an impact on decision making than other health related behaviours. The weaknesses in the TPB involving PBC and subjective norms measures has been a driving factor for improvements and expansions to the TPB (Ajzen, 2011). It was for this reason that habit, impulsivity, identity constructs and descriptive norms were tested in this study. UEA identity and self-identity significantly increased the explained variance in binge drinking intentions showing that elements of social influence affect intentions. Habit and lack of premeditation were predictive of self-reported binge drinking behaviour indicating elements of automaticity and impulsivity play a more direct role in predicting

behaviour. The following section will discuss some of the methodological strengths and limitations of the research before moving on to a discussion of future implication.

5.5.5.1 Strengths and limitations of Study 1

One of the major strengths of this study was the successful use of social cognitive models to explain the decision making process of young people to binge drink. A high proportion of the variance was explained in intentions and behaviour at least matching or exceeding that of previous research. Another strength includes the use of online questionnaires as research has shown online questionnaires actually have lower non-response rates than paper questionnaires (Denscombe, 2009) making them a useful tool for collecting data in this instance. This method of gathering data provided quick and easy access for the participants to complete the study from their phone, tablet or computer. Another strength was the success of the varied recruitment techniques (flyers, social media, emails and SONA systems). A large university wide sample was gathered consisting of a diverse group of participants.

When interpreting the findings of this study, note should be taken of potential methodological limitations. First, the measures used were all self-report. Though, this is nearly unavoidable for constructs such as attitudes, it could be of use to gather objective measures of alcohol use as well to examine the power of the TPB to predict such a behavioural measure. Much of the TPB literature has indicated that the theory significantly predicts objectively observed behaviours, although the level of prediction is often lower than for self-report measures of behaviour (Rivis & Sheeran, 2003). We might then have expected weaker but similar relationships if we had used objective measures of alcohol use. Another limitation included the majority of participants being female undergraduates at UEA. A broader sampling of the wider student population at UEA as well as from other universities might have improved the research making it more applicable to the general undergraduate population in the UK. But, for the purposes of this research assessing the undergraduate population at UEA was the aim for reasons already outlined in Chapter 2. It was also possible, regarding the lack of success with the norms measures and binge drinking, that young people felt as though they could not report being influenced by their peers (and associated normative behaviours) because it may have made them appear less independent (Nash et al., 2005). This problem could be solved by finding ways to measure social influences and norms indirectly (Ajzen, 2002a). On the other hand, the research does support the TPB model and was in line with previous research suggesting that social identity and habit along with components of the TPB are predictive of binge-drinking intentions and behaviours in young people.

5.5.6 Future implications

To discuss future implications and directions, this work showed explicit attitudes and identity were important predictors of intentions to binge drink over a one week period but normative measures still appeared weaker. Therefore, future research could build on these findings and consider further

variables such as implicit attitudes, identity manipulations and wider social norms. Taking into account intentions are important in predicting behaviour (and one possible way to look at behavioural changes as a way to reduce drinking is through self-regulatory strategies) implementation intentions (Gollwitzer, 1999) could be one approach warranting further research. Implementation intentions are intentions to specify the environmental cues associated with behavioural performance (I intend to go to the gym next Friday at 4pm). These have been shown to increase intention-behaviour consistency and increase behavioural performance (Sheeran & Orbell, 1999b). The addition of an implicit measure of alcohol attitudes may also be useful (H. Gray, LaPlante, Bannon, Ambady, & Shaffer, 2011) as explicit attitudes may have been influenced by self-report bias. Considering UEA identity and self-identity were predictive of intentions, these could be a focus of effective ways to change behaviours, such as using an identity manipulation (Berger & Rand, 2008). This method uses associating an out-group identity with an unwanted behaviour for the purposes of creating behavioural avoidance. These methods could have an impact in real world situations if brought in and implemented on university campuses. Equipping students with tools to change binge-drinking intentions and behaviours as well as offering an altered perception of the social norms could be effective ways of reducing the amount of risky drinking, improving the overall health and safety of the students. The upcoming study will incorporate an implicit measure of binge drinking attitudes and an identity manipulation to test if associating binge drinking with an out-group could affect attitude (both implicit and explicit) and intention.

6 Chapter 6: How does identity influence attitude and behaviour? Testing a social identity association intervention

6.1 Chapter Overview

Chapter 6 will outline the details of the second study. It is based on the findings from the first study which explored the use of the theory of planned behaviour (Beck & Ajzen, 1991) to predict binge drinking intentions and behaviour. Study 1 included the basic TPB model (explicit attitudes, subjective norms and PBC) as well as the additional variables of habit, impulsivity, UEA identity, group norms and descriptive norms. Explicit attitudes and social identity measures were predictive of intentions to binge drink in the next week; and intentions, sensation seeking (impulsivity) and habit were predictive of binge drinking behaviour at a 1-week follow-up. Moving forward from these findings this study will use the same expanded TPB model as study 1 with the additional measures of implicit attitudes while testing an intervention which assesses how social identity associations influence the decision making process to binge drink.

The chapter will begin with an introduction about implicit attitudes as additions to the TPB model. This is an important consideration as explicit measures of attitudes were used in the first study, and though well supported in binge drinking research have often been criticised as susceptible to self-presentation bias of which the participants may or may not be aware. Inclusion of implicit measures should increase accuracy in measuring attitudes toward alcohol. One aim of the research will be to assess how well the additional measures of implicit attitudes towards alcohol predicts intentions and/or behaviour in comparison with the explicit measures of attitude traditionally used.

Then, as the previous findings showed social identity was predictive of intentions to binge drink and could potentially be a target for designing interventions to change behaviour, we will explore how social identity associations influence a range of social and individual factors that contribute to young people's decisions to binge drink (e.g. attitude, and intentions) through a social identity association intervention.

The details of the methods will be outlined followed by the results of the study. 122 UEA undergraduates (male n=27, female n=95) take part in a longitudinal study (1 week follow-up). Of those, 110 complete the behaviour questionnaire at time 2. The ability of each TPB variable (explicit attitude, subjective norm and PBC) as well as additional variables (implicit attitude, habit, impulsivity, social identity and descriptive norm) to predict intentions and/or behaviour will be examined. Correlation analysis will be carried out to identify significant associations while a series of logistic regression analyses will be conducted to determine which of the additional variables predict intentions and/or behaviour independently to the traditional TPB variables. ANOVAs will be run to assess the impact of the social identity association intervention on all variables.

Finally, the chapter will conclude with a discussion of the strengths and limitations, and future implications of the findings. Some of the major strengths of the research include employing an

identity association intervention and using robust established measures such as the TPB alongside novel additions to the model such as implicit measures of attitude.

6.2 Introduction to Study 2: Assessing the influence of an identity association on an expanded TPB model including binge drinking attitudes, both implicit and explicit, habit, impulsivity, social identity and descriptive norms

It has been well established that the TPB can be extended if other variables are found to contribute to the prediction of behaviour after controlling for the existing components (Beck & Ajzen, 1991). Previous research has suggested that implicit cognitions in regards to alcohol could be an interesting addition to the TPB model as they measure the strength of a person's automatic, unconscious associations between mental representations of objects (Houben, Havermans, & Wiers, 2010). For example, an individual may have grown up in a society where it was socially unacceptable to consume alcohol but enjoys drinking and though they may explicitly say it's a positive experience when asked they may also unconsciously feel as though they are behaving contrary to social norms. Implicit cognitions include several aspects such as implicit attitudes, attentional bias and implicit arousal (these will be defined and discussed in the following section 5.2.1). The addition of IATs in this study addresses the criticism that the TPB lacks consideration of automatic influence on intention and behaviour (Ajzen & Fishbein, 2000). As in the first study, a measure of habit will again be included to cover one aspect of automaticity, but additionally two implicit associations tests (arousal and alcohol-identity), or IATs, will be used to measure implicit positive and negative alcohol associations and associations of alcohol with the self, compared to others. The IAT is designed to access the participants' responses to alcohol related stimuli without deliberative thought (unlike the explicit measure of binge drinking attitudes used in the traditional TPB). Additionally, social identity is a significant predictor of intentions to binge drink as highlighted in the first study therefore, it is a variable on which to focus for designing an intervention based experiment. This second study will assess how using identity associations, or associating binge drinking with an in-group or out-group, will influence behavioural determinants and change behavioural outcomes (Berger & Rand, 2008). This intervention could lead to a change in not only implicit and explicit binge drinking attitudes and intentions but actual self-reported behaviours. The main purposes of this study are to examine how social identity interventions can affect antecedents of binge drinking (i.e. explicit attitudes, subjective norms, PBC and intentions and identity) and how implicit measures of alcohol-identity and arousal add to the TPB model. The following sections will define implicit cognitions including implicit attitudes (6.2.1.1), attentional bias (6.2.1.2) and implicit arousal (6.2.1.3) while discussing the best way in which to measure implicit cognitions and how they may be an important addition to the TPB.

6.2.1 Implicit cognitions as an addition to the TPB

It is important to consider decisions are not always influenced by deliberative rational processing and may be effected by an experiential system of underlying automatic cognitive factors such as

habits and implicit associations (Ostafin & Palfai, 2006; Thush & Wiers, 2007). This is where measuring implicit cognitions could be an important additive component to the TPB model. Implicit cognitions are assumed to be automatic, less available to conscious awareness and typically assessed using indirect measures involving reaction times, attentional bias tasks, arousal and memory associations (Rooke, Hine, & Thorsteinsson, 2008). Several aspects of implicit cognitions that may affect substance use decisions and behaviours include implicit attitudes, attentional bias and implicit arousal (Rooke et al., 2008). These three aspects of implicit cognitions will be defined and methods for measuring them, as well as how such measures will be incorporated into the present study will be discussed. Finally, key research employing implicit methods in alcohol research will be reviewed and a summary of implicit cognitions will conclude this section.

6.2.1.1 What are implicit attitudes?

Implicit attitudes are evaluations that occur without conscious awareness towards an attitude object or the self and these are often positive or negative associations (Greenwald & Banaji, 1995). They are traces of past experience that mediate favourable or unfavourable feelings, thought or action towards social objects and may have an influence on behaviour that the individual may not be aware of (Gawronski & Payne, 2011). Some evaluations towards attitude objects may be socially unacceptable, for example racial stereotyping; this may lead individuals to employ behavioural regulations to avoid exposing the socially unwanted attitudes. When asked to explicitly state what attitude an individual holds towards an object, they have the opportunity to assess the socially appropriate responses, deliberately form an attitude at a conscious level and reply in a manner that is socially acceptable. This can be problematic in research as it makes finding the automatic, unconsciously formed associations difficult.

Regarding implicit attitudes and alcohol more specifically, dual process models imply that alcohol use is related to implicit as well as explicit cognitive processes and addictive behaviour is determined by the interplay of two qualitatively different systems: an impulsive system with automatic appraisal of stimuli and a slower, reflective system which includes controlled processes related to conscious deliberations (Houben et al., 2010; Larsen, Engels, Wiers, Granic, & Spijkerman, 2012). With regular alcohol use, the impulsive system undergoes changes in its associative network and through experience it automatically assigns stronger positive affect and increased motivational value to alcohol related cues, for example, alcohol relieving anxiety may encourage increased consumption (Houben et al., 2010). These automatic processes are activated whenever alcohol-related cues are encountered and generate strong impulses to drink alcohol via the automatic activation of behavioural schemas; this is consistent with the idea that alcohol is implicitly associated with positive affect, therefore stronger implicit alcohol-positive associations reliably predict increased levels of alcohol use (Houben et al., 2010; Jajodia & Earleywine, 2003; McCarthy & Thompsen, 2006). The most important advantage of these indirect measures is that

they are less susceptible to self-presentation or deception and might reveal cognitions that are not available to conscious awareness (De Houwer, Crombez, Koster, & Beul, 2004). A measure of implicit associations would benefit the model, help to avoid any self-presentation bias and increase accuracy in measurement. This could give an indication which implicit associations, either more positive or negative, undergraduates have with binge drinking and whether positive associations can predict greater intentions to binge drink or increased self-reported binge drinking behaviour.

6.2.1.1.1 How are implicit attitudes measured?

One way of measuring implicit attitudes is through Implicit Association Tests or IATs (Greenwald, McGhee, & Schwartz, 1998). IATs employ categorisation tasks to assess the relative strength of associations between a target stimulus and contrasting stimulus. They show a target and a contrast response category, for example alcohol and soft drinks, on opposite sides of a computer screen with one response category appearing with a positive attribute word (e.g. alcohol and good) and the other with a negative attribute word (e.g. soft drinks and bad). An example of how these response categories appear on screen in an IAT can be seen in Figure 6.1 on the following page. Participants then assign stimuli that appear in the centre of the screen to one of the two categories as quickly as possible. The response times reflect how strongly the two concepts are associated in memory meaning more congruent associations will produce shorter response times. For example, shorter response times to the 'alcohol and good' response category would indicate more positive implicit associations with alcohol in comparison to soft drinks.

An IAT is one way of measuring implicit associations but they have been criticised for only measuring in a bipolar way and not considering that some individuals possess both positive and negative implicit associations with a stimulus (Gawronski & Payne, 2011). One example of this may be when an individual associates eating cake with gaining weight (negative) and also with reducing stress (positive). Another issue with the original IAT (Greenwald, Nosek, & Banaji, 2003) is that attitudes are only assessed in relation to contrast category creating problems when certain stimuli do not have an obvious contrast category such as cocaine. Some have suggested a unipolar IAT that assesses positive and negative attitudes separately (McCarthy & Thompsen, 2006); a single target IAT which measures the strength of evaluative associations with a single attitude object (Wigboldus, Holland, & van Knippenberg, 2004); and the Go/No-Go Association Task which compares a single target category with contrasting groups (Nosek & Banaji, 2001). Though these methods have been shown to be effective when there is no clear contrasting category we believe that alcohol has an easily understandable contrasting category (non-alcoholic beverages or soft-drinks) making the IAT a useful tool when assessing implicit association regarding alcohol.



Figure 6.1. Example of IAT stimulus and response categories

Another example of a measure for implicit associations that relies on response times is the Extrinsic Affective Simon Task (De Houwer, 2003) which requires participants to classify white adjectives based on their valence and coloured target and contrast stimulus words based only on their colour. A few other methods of measuring implicit attitudes include affective priming, expectancy accessibility, word association techniques and the stimulus-response compatibility task. Though IATs have some weaknesses they are a robust well-tested method of testing implicit association and their predictive validity has been demonstrated in a wide range of domains including alcohol and drugs use behaviour (Greenwald, Poehlman, Uhlmann, & Banaji, 2009) which is why they will be used as an addition to the basic TPB model in this study. Next, another facet of implicit cognitions, attentional bias, will be discussed.

6.2.1.2 What is attentional bias?

Another aspect of implicit cognitions are attentional bias, or tendency of perception to be affected by recurring thoughts, and this may guide substance use including binge drinking behaviour at a preconscious level (Cox, Fadardi, & Pothos, 2006; Reinout W Wiers & Stacy, 2006). An attentional bias is said to be present when a stimulus source has more impact on cognitive life and behaviour than might otherwise be expected (Bruce & Jones, 2006). Either due to natural inclination or past learning experiences, possibly even addiction, individuals may be more likely

to have their attentional focus automatically captured by substance-related cues (e.g. alcohol advertising) in the environment. Once it is captured, the environmental cues (e.g. night out with friends) are thought to have greater influence on behaviour. For example, people who frequently think about binge drinking pay more attention to the binge drinking of others and may be more likely to binge drink in the future. Attentional bias can be measured several ways and these are discussed in the upcoming section.

6.2.1.2.1 How is attentional bias measured?

The most commonly used measure of attentional bias is the Addiction-Stroop Test (Bruce & Jones, 2006; Cox et al., 2006). This test assesses the degree to which individuals are distracted by drug cues by measuring the speed and accuracy the participants name the colours of neutral versus drug-related words. Another often used approach to measuring attentional bias is the visual focus localisation task, a computer based task assessing the speed with which participants detect the appearance of a dot (dot probe task), a symbol (visual probe task) and or a change (flicker paradigm) (MacLeod, Mathews, & Tata, 1986). It works by detecting the location of the participant's visual attention using eye tracking, to show if they more quickly identify a stimulus change in the location of a drug stimulus on a computer screen relative to the location of a neutral stimulus. Quicker responses for the drug stimulus would indicate they have an attentional bias toward the drug stimuli. Though this component of implicit cognitions could be useful in substance use research, for ease of measure and simplicity of using the IATs alongside the TPB, attentional bias regarding binge drinking and alcohol will not be measured in this study. Keeping demands on the participants reasonable and promoting good retention in what will be a prospective study is important. The third aspect of implicit cognitions, implicit arousal, will be defined and ways of measuring implicit arousal will be discussed in the following section.

6.2.1.3 What is implicit arousal?

Implicit arousals are another aspect of implicit cognitions to consider. Whereas implicit attitudes may refer to the semantic association between the object and the concept of good or bad (e.g. soft drink and good, or alcohol and bad), implicit arousal may refer to the affective component of the aroused affective association between the object and active and passive concepts (e.g. alcohol and excited, or soft drinks and relaxed) (De Houwer et al., 2004; Reinout W Wiers & Stacy, 2006). T. E. Robinson and Berridge (1993) suggest that substance use is related more to 'wanting' (arousal) than to 'liking' (attitude). This form of arousal to substance-related cues (e.g. faster associations with alcohol and active words) is linked to heavier alcohol consumption and implicit sedation (e.g. faster associations with alcohol and passive words) with lighter use of substances (Dunn & Earleywine, 2001; Goldman et al., 1999).

6.2.1.3.1 How is implicit arousal measured?

Implicit arousal can be measured through psychophysiological measures such as electrocardiographic, electro dermal activity and galvanic skin response. Implicit arousal can also be measured through indirect measures with an arousal IAT using words associated with arousal (e.g. excited) and sedation (e.g. relaxed) in place of the traditional positive or negative words used in the original IAT. An arousal IAT like the one found in De Houwer et al. (2004) will be used alongside the basic TPB model in this study to measure implicit alcohol arousal associations. The following section will discuss specific key literature pertaining to implicit measures in alcohol research, giving an indication how these measures have been used previously and how they will be used in this research.

6.2.1.4 Key relevant studies of implicit measures in alcohol research

Houben et al. (2010) suggested that implicit cognitions in regards to alcohol may be an interesting addition to the TPB model as they measure the strength of a person's automatic, unconscious associations between mental representations of objects. Using implicit measures in alcohol research such as IATs may address the criticism that the TPB lacks consideration of automatic influence on intention and behaviour (Ajzen & Fishbein, 2000). This section will discuss four key empirical examples of the role of implicit measures in alcohol related research including a meta-analysis, an intervention study and two examples of using IATs: Rooke et al. (2008), Houben et al. (2010), De Houwer et al. (2004) and H. Gray et al. (2011).

6.2.1.4.1 Implicit cognitions and substance use: A meta-analysis

Highlighting the connection between implicit measures and substance use, a meta-analysis by Rooke et al. (2008) estimated the magnitude of the relationship between substance-related implicit cognitions (including implicit attitude, arousal, attentional bias and semantic associations) and the use of legal and illegal substances. The main objectives were: to explicitly compare the predictive validity of different implicit cognition measures; to determine whether there was a reliable relationship between implicit cognition and substance use; to quantify the magnitude of this relationship; and to determine whether four methodological factors (facet of implicit cognition, measurement approach, participant age and substance type) would operate as moderators. They aimed to provide insights into whether all facets of implicit cognitions, including implicit attitudes and implicit arousal, were equally robust predictors of substance use behaviour. They also wanted to aid future researchers and practitioners through identifying the implicit measures that exhibited the best concurrent and predictive validity all through a meta-analysis of existing research.

Table 6.1 shows the moderator analysis for four facets of implicit cognitions (attitude, arousal, attentional bias and semantic associations) drawn from Rooke et al. (2008). The results showed studies employing semantic memory associations produced the largest average effects size ($r=.38$)

followed by studies assessing implicit attitudes ($r=.27$) and attentional bias ($r=.26$), although the 95% confidence intervals for these three overlapped considerably. Interestingly, the average effect size for studies using implicit arousal was not significantly different from 0, but this result appeared to be due to the inclusion of unipolar measures of sedation. When these unipolar measures were removed, the implicit arousal effect sizes were significant ($r=.24$).

Table 6.1 – Moderator analysis for facet of cognition

Cognition aspect	n	r	-----CI 95%-----		p	-Homogeneity Analysis -		
			Lower	Upper		Q	df	p
Attitude ^a	72	.27	.21	.31	<.001	50.81	71	.97
Arousal ^b	12	.11	-.02	.24	.09	12.75	11	.31
Attentional bias ^{ab}	26	.26	.17	.35	<.001	9.37	25	.99
Semantic assoc. ^a	28	.38	.31	.45	<.001	35.81	27	.12

Note. Homogeneity analysis based on Fisher's r , r values based on inverse transformation of Fisher's r . Categories with differing superscripts are significantly different from each other. CI = confidence interval.

All of the measures employed significantly predicted substance use behaviour with the exception of the Extrinsic Affective Simon Task (De Houwer, 2003) or EAST (a modified version of an IAT which is based on a comparison of performance on trials of a single task rather than a comparison of performance on different tasks). They concluded implicit cognitions were reliably associated with substance use and the association was moderate in magnitude. The results did show the effect sizes for the IAT were all similar and unfluctuating; this was possibly due to the small number of unipolar sedation measures and unipolar negative valence measures positively correlating with substance use. This reduced the overall effect size for the IAT and suggested that bipolar IATs may obscure the implicit cognitive processes they attempt to measure. Some limitations were that some of the subgroups within moderator variables had been employed in few studies providing a lack of evidence to draw reliable conclusions. Also, the effect sizes in the analysis were derived from correlational data therefore no causal conclusions concerning the overlap between implicit cognitions and substance use can definitively be drawn. The meta-analysis could be improved by having different guidelines for choosing studies and by having more research to consider. The meta-analyses reinforces the importance of considering the role of implicit cognition in the initiation and maintenance of drug use and of developing drug use interventions specifically targeting affect and various types of automatic cognitive responses. Overall, it showed significant positive relationships between substance-related implicit cognition and self-reported substance use which suggests using implicit measure of attitude such as the IAT may be a useful addition to this

expanded TPB study as a predictor. Next, we will discuss a study testing whether implicit attitudes can be affected through an intervention.

6.2.1.4.2 Learning to dislike alcohol: conditioning negative implicit attitudes towards alcohol and its effect on drinking behaviour

A key intervention study by Houben et al. (2010) tested whether implicit associations with alcohol can be influenced through an intervention. They suggested evaluative conditioning (EC) may be an effective tool in changing implicit attitudes toward alcohol. EC is based on the idea that repeated pairings of an attitude object (e.g. binge drinking) with objects of positive affective value (e.g. smiling face) or negative affective value (e.g. frowning face) can change the implicit attitude in the direction of the objects with which it is paired. 116 students from a Dutch university participated in an EC task first followed by contingency awareness (measuring awareness of the stimulus pairings in the EC) and a standard IAT measuring whether alcohol was associated more strongly with negative affect (e.g. sorrow, war, depression) or with positive affect (e.g. love, sunshine, peace). They also completed explicit alcohol-related expectancies and attitude measures and an alcohol use measure. Participants performing an EC task that consistently paired alcohol-related stimuli with general negative pictures showed stronger negative implicit attitudes toward alcohol when compared to control participants who were not exposed to the critical alcohol-negative pairings. The EC intervention effectively reduced positive implicit attitudes toward alcohol but they could not clarify whether the EC increased negative implicit associations with alcohol or simply reduced positive implicit alcohol associations. These findings suggest that interventions can be effective at changing implicit attitudes and may be a useful tool to change implicit alcohol-related cognitions and possibly drinking behaviour. This is why we may see an identity intervention (like the one discussed later in section 6.2.2) be effective at changing implicit attitudes in this study. The following section will discuss another key study testing two alcohol-related IATs.

6.2.1.4.3 Implicit alcohol-related cognitions in a clinical sample of heavy drinkers

In another example of employing IATs in an alcohol context, De Houwer et al. (2004) investigated and replicated previous research on implicit attitudes by testing 2 IATs (attitudes and arousal) and the Extrinsic Affective Simon Task (EAST). All three tasks used names of alcoholic drink (i.e. beer, whisky and vodka) and names of soft drinks (water, cola and orange juice). The attitude IAT and EAST used participants' individually selected liked and disliked items whereas the arousal IAT used active words (i.e. excited, cheerful and lively) and passive words (i.e. relaxed, calm and quiet). Participants consisted of men and women who were either hospitalised or undergoing follow-up treatment after being hospitalised at an alcohol-rehabilitation clinic. There was evidence of the sample expressing more negative implicit attitudes toward alcohol than toward soft drinks. Also, they possessed stronger implicit alcohol arousal associations. The evidence was supported

not only by the IATs but also by the EAST which allowed separate analysis of alcohol and soft drinks. The separate analysis using the EAST showed that participants held more positive implicit attitudes toward soft drinks but more ambivalent implicit attitudes towards alcoholic drinks. These ambivalent findings could be due to the fact that there were positive and negative valence associated with alcohol especially for those in an alcohol-rehabilitation clinic and more research should be done regarding ambivalent attitudes and alcohol in a student population. This research showed indirect measures of alcohol-related cognitions could be used in a meaningful way in a clinical sample providing a step toward a broader use of these techniques. It also replicated results of other research providing further support that implicit attitudes toward alcohol are more negative than those toward soft drinks in both the IAT and the EAST. They found evidence for heavy drinkers treated for alcohol abuse have more negative implicit attitudes toward alcohol than toward soft drink and the patients implicitly associate arousal more with alcohol than with soft drinks. For the purposes of this study, these findings show that the IATs could be an effective tool for assessing implicit alcohol associations in the context of the planned study. The following section will discuss a second key study employing an IAT while incorporating identity.

6.2.1.4.4 Development and validation of the alcohol identity implicit association test (AI-IAT)

A further key study by H. Gray et al. (2011) used alcohol specific IATs and introduced the concept of alcohol identity in a longitudinal experiment. Alcohol identity was defined as the extent to which an individual perceived drinking alcohol to be a defining characteristic of their self-identity. Because people are motivated to maintain consistency in self-views, the concept of self-identity has been a powerful determinant of behaviour and alcohol identity could provide a more specific antecedent to risky drinking practices. This alcohol identity concept was incorporated into an IAT to measure implicit alcohol identity associations to avoid relying on introspective awareness or requiring self-reflection and deliberation. This included a self-relevant category (e.g. self, mine, me) and other-relevant category (e.g. others, them, they) to which the participants would assign alcohol or non-alcohol related images. They developed and validated this easily administered implicit measure of alcohol identity and measured prospectively its association with future risky college drinking practices. They carried out a longitudinal experiment with a sample of 141 students from an American university. The students completed an autophotoessay, which asked the participant to take a series of pictures that together represented an answer to the question, "Who are you?" The participants then completed an Alcohol Identity Implicit Attitudes Test (AI-IAT). Reaction times were recorded for participants' selection of words in associations with alcoholic/non-alcoholic images. Alcohol consumption was measured and risky college drinking practices were measured at the 3 and 6-month assessments. The results suggested that the AI-IAT was a valid measure of alcohol and its role in identity and that alcohol identity measured at the implicit level were associated with future engagement in risky drinking activities. Some limitations include the lack of measures for intentions to drink as it was unclear whether alcohol

identity had a direct or an indirect influence on behaviour. The TPB could have improved the research but the findings do support existing research as it concluded that alcohol identity contributes to the development of risky drinking habits. This research provided an effective example of employing the use of an IAT with social identity and will be the basis for the AI-IAT for this study.

6.2.1.5 Summary of implicit cognitions as an addition to the TPB

Measuring implicit cognitions could be an important additive component to the TPB model as decisions are not always influenced by deliberative processing (Thush & Wiers, 2007). Implicit cognitions use an experiential system of underlying automatic cognitive factors and are made up of several facets including attitudes, attentional bias and arousal (Reinout W Wiers & Stacy, 2006). These three facets of implicit cognitions discussed above are by no means an exhaustive list of implicit cognitions but for the scope of this thesis these are the most important and relevant because they are well established constructs and have been researched in an alcohol context (Banaji, Roediger III, Nairne, Neath, & Surprenant, 2001; De Houwer et al., 2004; de Liver, van der Pligt, & Wigboldus, 2007; Greenwald & Banaji, 1995). Implicit attitudes have been defined as evaluations that occur without conscious awareness towards an attitude object (e.g. binge drinking) or the self and these are often positive or negative associations (Greenwald & Banaji, 1995) making them quite different from explicit attitudes which are consciously drawn upon. Implicit attitudes are the most commonly researched and most often used IATs in assessments. As this thesis uses a social psychological approach to understanding decision making, there will not be an investigation of attentional bias as a way of understanding implicit cognition's role in explaining behaviours but arousal will be of interest and can be measured using a similar method (e.g. IATs) to that of implicit attitudes. Using IATs to measure implicit alcohol identity and arousal will create a simplified way to measure two separate aspects of implicit cognitions not only for data analysis but also for ease of the participants completing the experiment. Overall, the key research discussed above showed implicit alcohol identity and implicit arousal have a significant positive relationship with self-reported substance use. This reinforces the importance of considering the role of implicit attitudes and implicit arousal in the maintenance of drug use and development of drug use interventions targeting automatic cognitive responses. IATs have shown somewhat ambivalent association with alcohol are commonly held and have been used often in alcohol research (Rooke et al., 2008). Manipulating identity salience or identity associations could be useful tools in changing implicit cognitions towards alcohol and tailoring IATs to include important elements such as self-identity or alcohol identity (while using them to also assess positive or negative alcohol associations) could help to explain drinking intentions and behaviours. The following section will discuss using a social identity intervention to explore how a social identity association will influence the decision making process of young people to binge drink.

6.2.2 Social identity manipulation

As social identity was an important predictor of intentions to binge in the first study of this thesis, it has become a focus for testing an intervention in binge drinking behaviour in the current study. As discussed in Chapter 4 (section 4.3), the Social Identity Theory (SIT) (Hogg & Abrams, 1988) is a theory of group processes and intergroup relations that distinguishes group phenomena from interpersonal phenomena. According to Abrams and Hogg (1999) an important component of the self-concept is derived from memberships in social groups and categories where individuals define and evaluate themselves in terms of a self-inclusive social category. There is a need to maintain a positive social identity by accentuating differences between the in-group and out-group while strengthening the similarities among the self and in-group members on stereotypic dimensions (K. Johnston & White, 2003). This concept has been used to create identity manipulations for interventions to change many behaviours (e.g. a negative health behaviours such as binge drinking) by associating the health behaviour with an out-group to decrease positive attitudes and frequency of behaviour and an in-group to increase them (Berger & Rand, 2008). An out-group association could lead to avoidance of the unwanted health behaviours and in the case of risky behaviours like binge drinking, avoidance could have health benefits. Two key studies discussing research employing these methods are outlined below.

6.2.2.1 Terry, Hogg et al. (2000): Attitude-behaviour relations: The role of in-group norms and mode of behavioural decision making

The first key experimental social identity research by Terry et al. (2000) employed two separate experiments to examine the effects of in-group norms, salience of group membership and mode of behavioural decision-making on attitude-behaviour relations. A total of 235 first year psychology students at an Australian university participated for course credit. Two experiments assessed how a social identity association influenced attitudes towards different career choices in psychology. The first experiment assessed levels of normative support (either congruent or incongruent in-group norms) and the mode of behavioural decision-making (either spontaneous or deliberative). The salience of group membership was tested as strength of identification with the group membership under consideration. The second experiment extended the first by manipulating rather than measuring the salience of group membership; and employing an ability rather than a motivational (deliberative rather than spontaneous) procedure to manipulate mode of behavioural decision making. The participants rank-ordered their career preferences in psychology, completed demographic and background info and a self-description task. The self-description task required them to think about themselves as a psychology student, to describe what they shared in common with other psychology students and how they differed from non-psychology students. The participants were assigned to groups with a congruent in-group norm or a no-norm condition. According to group assignment, they received normative information of either congruent information to what their career preference was or support for other options. They

then chose to attend an information session on a particular career and after choosing, they filled out a willingness to perform behaviours questionnaire. The second experiment manipulated the salience of the group membership and employed an ability (rather than a memory-based) manipulation of mode of behavioural decision-making. It was expected that participants agree with other in-group members thus when exposed to an attitudinally incongruent norm from a self-inclusive group or salient group, they would adjust their attitudes so that they will be in line with the salient group norms. The effect was expected to be strongest for the higher salience participants who made their behavioural decision under deliberative rather than spontaneous decision-making conditions. The central hypothesis was supported where the results of the second study indicated that the extent of attitude-behaviour consistency was influenced by the attitudinal congruence of in-group normative information. Regarding the measure of attitude-behaviour inconsistency, an incongruent group norm produced greater behavioural deviance from a previously expressed attitude than exposure to a congruent group norm. Further analyses revealed that the attitude-behaviour consistency in the norm incongruent condition emulated movement towards the pole represented by the group norm. The results of all the experiments taken together provided support for the proposed reconceptualization of the role of norms in attitude-behaviour relations along the lines suggested by social identity/self-categorisation theories. This research is important as it showed how using an identity manipulation can influence TPB variables. This can then be used to build identity based interventions in an attempt to reduce risky health behaviours like binge drinking. Another key study using an identity intervention is discussed in the following section.

6.2.2.2 Berger and Rand (2008): Shifting signals to help health, using identity signalling to reduce risky health behaviours

In a test of how identity can be used in an intervention in an American university context, Berger and Rand (2008) ran three identity-based intervention experiments. The goals of the three studies were to examine how identity-based interventions could improve consumer health and whether campaigns that linked risky health behaviours to avoidance groups could enhance the health of populations. They examined whether identity-avoidance manipulations can actually shift identity associations. The first experiment involved a pre-test to identify an out-group of the participants. Then, 50 undergraduate students completed two studies as part of a larger lab session. The participants were randomly assigned to groups to read an article in which they were told they would have to analyse the writing style (each article differed in content). The difference between conditions was the social group that the articles linked to junk food consumption, with the in-group identity being 'undergraduates' and the out-group being 'graduate students'. They then completed filler surveys and a food choice task of selecting either healthy or unhealthy foods. Overall, the first experiment showed associating junk food with an out-group lead people to make healthier choices with participants in the out-group signal condition choosing less junk food. In the second experiment, 87 undergraduates were recruited from two all-freshman (first years) dormitories. Flyers promoting responsible drinking were posted in restrooms and on bulletin

boards throughout the first dormitory and an out-group association flyer linking alcohol consumption with graduate students were placed in the second dormitory. This flyer depicted a graduate student holding an alcoholic beverage and suggested, “Lots of graduate students at (uni) drink...and lots of them are sketchy. So think when you drink...Nobody wants to be mistaken for this guy.” The control flyer (promoting responsible drinking) did not address social identity, only provided information and detailed the negative health effects of alcohol. After a two week period of exposure the participants were invited via email to take part in a short online questionnaire which asked them to report the amount of alcohol they consumed in the past week, their perception of how frequently members of other groups drank and whether they wanted others to think they were akin to members of various other groups. The findings of this second experiment showed that the out-group association (linking alcohol consumption with graduate students) seemed to decrease reported alcohol consumption compared to control participants. There was a significant effect of identity association among people who wanted to avoid others thinking they were akin to graduate students. Participants not wanting to be confused with graduate students reported drinking less when a manipulation linked graduate students to alcohol consumption. The third experiment tested the concepts of the first two experiments in a real world scenario by stopping participants on the way into a campus eatery and having them read similar materials to the first study. Then they monitored the participants’ food choices after having read the article. Participants in the avoidance group (out-group association) condition selected items perceived as healthier. Also, among high self-monitors (individuals with high public self-consciousness) there was an effect of junk food appeal. When they were exposed to information linking junk food consumption to a dissociative out-group they chose options perceived as healthier. There was a self-monitoring and junk food appeal interaction. All of this research demonstrated the utility of identity-avoidance campaigns to mitigate risky consumer behaviours. Identity associations can influence a wide variety of health decisions and identity-based interventions could be useful in improving consumer and student health particularly with regards to binge drinking. Though, careful consideration should be given when choosing an out-group as it could have adverse effects on those who identify with that group. Some weaknesses in the research included a small sample size limited to one university making it quite hard to apply the findings to a wider population or even to those populations outside the US. A test of the intervention in the UK with a larger population could address some of these issues. The methods employed in this key study will be used to build an identity intervention for this second study to test whether an in-group/out-group association can change binge drinking attitudes and behaviour. Before discussing the central research questions, we will discuss the stability of attitudes.

6.2.3 Attitude Stability

An attempt to create attitude change through an identity association intervention should take into account how attitudes are formed and whether they are stable or flexible variables somewhat dependent on situational influence. Attitudes have been defined as evaluations that refer to

associations between an attitude object and an evaluative category such as good vs bad (Albarracin, Wang, Li, & Noguchi, 2008). According to Prislin (1996), our attitudes and beliefs have been regarded as relatively stable representations one can easily access through conscious thought. Alternatively, Walton and Banaji (2004) suggested that attitudes were not consistent and their expression could depend on contextual circumstances such as the significant others (friends or family) surrounding the person. This was a crucial argument, as attitude rigidity could possibly be an important factor regarding attitude change interventions. As suggested by tests such as the IAT (Greenwald et al., 2009) we may not always be aware of our attitudes, they may be implicit and automatic operating outside of conscious awareness or control. Attitudes also have a memory component that involves evaluative thoughts or mental representations generated about an object at a particular time and place showing they are activated when elicited (Albarracin et al., 2008). Attitude activation, defined as the retrieval of one's evaluation of the attitude object from memory, influences perception of the attitude object and the situation in which it was encountered (Bargh, Chaiken, Gower, & Pratto, 1992). This provides further support that attitudes are less stable and retrieved according to the situation.

There has also been evidence that we treat our attitudes and beliefs as if they were valued possessions, as important social markers of our identity and what we value (Abelson, 1986). Although attitudes have been shown to appear as part of 'who we are' and easily accessible at times, they have not necessarily always been stable constructs according to some research (Bem & McConnell, 1970; Goethals & Reckman, 1973; Gross & Ellsworth, 2001). They are often highly dependent on the condition in which they retrieved, for example, if a particular group identity is more salient (e.g. a Chelsea football supporter at a football match) then attitudes congruent with the group norms are likely to be stronger. This highlights attitudes could also be dependent not only on the significant others and relevant norms but the associated salient identity. If attitudes are relatively stable and unchanging as Prislin (1996) claims, they would not comprise a desirable construct on which to build an intervention. But, if they are determined situationally and easily shaped by the immediate environment, significant others or relevant norms then attitudes would be an ideal focal point for behaviour change (Bryan, Walton, Rogers, & Dweck, 2011; Gelman & Heyman, 1999). Therefore, like Walton and Banaji (2004) this study will consider attitudes not as stable representations recalled at any time but unstable ones whose expression would be influenced by a wide variety of cognitive and social factors which will be tested through an identity association intervention. The following section will outline the central research questions of this study.

6.2.4 Central research questions

The overall aim is to evaluate the extent to which an identity association intervention impacts an expanded TPB explaining binge drinking intentions and behaviour while assessing how the

addition of implicit attitudes tested through two separate IATs (alcohol-identity and arousal) can improve the ability to predict intentions and behaviour.

6.2.4.1 Hypotheses

1. The out-group identity association will produce less positive explicit attitudes toward binge drinking, decreased implicit alcohol-identity and decreased alcohol implicit arousal.
2. The in-group identity association will produce more positive explicit attitudes toward binge drinking, increased implicit alcohol-identity and increased alcohol implicit arousal.
3. The basic TPB variables (attitude, subjective norms and PBC) with the additional variables (implicit alcohol identity, implicit alcohol arousal, habit, impulsivity, social identity and descriptive norms) will predict intentions to binge drink in the next week, measured at time 1.
 - a. Positive attitudes will be independently predictive of greater intentions to binge drink in the next week.
 - b. Increased subjective norms will be independently predictive of greater intentions to binge drink in the next week.
 - c. Greater PBC will independently predict greater intentions to binge drink in the next week.
 - d. Stronger implicit alcohol-identity will independently predict greater intentions to binge drink in the next week.
 - e. Increased alcohol implicit arousal will independently predict greater intentions to binge drink in the next week.
 - f. Higher habit scores will be independently predictive of greater intentions to binge drink in the next week.
 - g. Increased impulsivity levels (lack of premeditation, urgency, sensation seeking and lack of perseverance) will independently predict greater intentions to binge drink in the next week.
 - h. Greater UEA identity will be independently predictive of greater intentions to binge drink in the next week.
 - i. Higher group norms scores will be independently predictive of greater intentions to binge drink in the next week.
 - j. Stronger self-identity as someone who binge drinks will be independently predictive of greater intentions to binge drink in the next week.
 - k. Descriptive norms will independently predict intentions to binge drink in the next week.

4. TPB measures (intentions and PBC) with the additional variables of implicit alcohol-identity, implicit alcohol arousal, habit and impulsivity will predict self-reported binge drinking behaviour measured at time 2.
 - a. Greater intentions to binge drink in the next week will independently predict increased self-reported binge drinking behaviour measured at time 2.
 - b. Greater PBC will independently predict increased self-reported binge drinking behaviour measured at time 2.
 - c. Stronger implicit alcohol-identity will independently predict increased self-reported binge drinking behaviour measured at time 2.
 - d. Increased alcohol implicit arousal will independently predict increased self-reported binge drinking behaviour measured at time 2.
 - e. Higher habit scores will independently predict increased self-reported binge drinking behaviour measured at time 2.
 - f. Higher impulsivity levels (lack of premeditation, urgency, sensation seeking and lack of perseverance) will independently predict increased self-reported binge drinking behaviour measured at time 2.

6.3 Methods

6.3.1 Participants

An opportunistic sample of 122 undergraduate students from the University of East Anglia took part in time 1 of this research. 110 completed the time 2 behaviour questionnaire, a 90 per cent retention rate. Participants were recruited through social media, emails, flyers and SONA. The students were at least 18 years of age and included both male ($n=27$) and female ($n=95$) students. The mean age for the participants was 20.39 years ($SD = 6.68$), median of 19, mode of 19 and 77.9% were female and 22.1% were male.

6.3.2 Design

Data was gathered in a longitudinal study with time 1 and time 2 being a week apart and analysed using PASW (SPSS) 18. The data was gathered during 2013-14 (from September to April). The dependent variables were intentions to binge drink, attitude, subjective norms, PBC, habit, impulsivity, self-identity and social identity constructs. The independent variables were the 4 levels of the social identity manipulations: control, in-group, out-group and health campaign.

6.3.3 Materials

At time 1, an E-Prime computer task was available for participants to complete only in a computer lab on campus. It consisted of a social identity association intervention, an Alcohol-Identity IAT,

an arousal IAT and an extended TPB questionnaire. Examples of materials can be found in the Appendices.

6.3.3.1 Identity manipulation

At the start of Time 1, the identity manipulation portion of the task, similar to Berger and Rand (2008), was presented. Each participant was asked to read and comment on the writing style of three separate short articles. Above each article was a picture advert relating to that article (found in Appendix I) and below was a text box to allow for their responses. The three articles included for each participant were: a manipulation article; an elephant poaching article discussing how poaching for ivory could lead to the extinction of elephants; and an economy article discussing how underemployment could have long term damage on the economy. The elephant poaching and economy articles were added to ensure that the participants were less aware of the purpose of the study. The specific manipulation article that appeared for each participant was dependent on which experimental group they were randomly assigned. The experimental groups were: an in-group association; an out-group association; and a negative alcohol campaign. The in-group association linked binge drinking with UEA undergraduates, framing it as a behaviour UEA undergraduates carried out often. The out-group association linked binge drinking with University of Essex undergraduates, framing it as a behaviour Essex undergraduates carried out often. The negative alcohol campaign did not associate binge drinking with any group of people but provided facts about the negative impacts alcohol can have on the health of individuals. A fourth group, or control group, skipped the article section of the experiment altogether.

6.3.3.2 Implicit Association Tests

The first IAT tested implicit arousal toward alcohol as seen in De Houwer et al. (2004) and the second was an alcohol identity IAT as in H. Gray et al. (2011). These were both counterbalanced. The alcohol –identity IAT was developed using the standard procedures for the IAT (Greenwald et al., 1998). The stimuli were alcohol-related pictures, drinking water-related pictures, self-relevant words (i.e. ‘self,’ ‘me,’ ‘my,’ ‘mine,’ ‘myself’) and other-relevant words (i.e. ‘they,’ ‘them,’ ‘theirs,’ ‘others,’ ‘other’). The congruent blocks had each participant pair alcohol-related pictures with self-relevant words and water-related pictures with other-relevant words. For example, each participant would see an image of a pint of lager and need to assign it either to the joint category ‘alcohol or me’ or the joint category ‘water or not me.’ An example of what appeared on screen can be found in Figure 6.1. Assigning the pint of lager to the ‘alcohol or me’ category would be considered the correct response for the congruent blocks. For the incongruent blocks, participants paired alcohol-related pictures with other-relevant words and water-related pictures with self-relevant words. Participants would need to assign the image of a pint of lager to the category ‘alcohol or not me’ rather than the category ‘water or me’ for a correct response. The

arousal IAT used the same procedure as the alcohol-identity IAT though in place of alcohol or water-related pictures were alcohol (i.e. beer, whisky, vodka, wine, cider) and non-alcohol (i.e. cola, orange juice, water, tea, milk) related words. Also, in place of self or other-relevant words were arousal words either good (i.e. success, peace, beautiful, love and kindness) or bad (i.e. murder, war, hate, pain and violence). Participants responded using the 'Q' and 'P' keys on a QWERTY keyboard. This was followed by a questionnaire assessing components of the theory of planned behaviour (behavioural intentions, explicit attitudes, subjective norms and PBC), habit, impulsivity, social identity, descriptive norms and questions assessing variables such as demographics were available on a lab based computer. All words were presented in black on a grey background and written in uppercase letters.

6.3.3.3 Behaviour

At time two, one week after the first questionnaire, like in the first study and similar to K. Johnston and White (2003) the participants completed measures about their drinking behaviour during the prior week such as, "I participated in a binge drinking session in the last week: definitely no (1-7) definitely yes." A combination of four, 7-point Likert-type questions and two numerical-answer questions were used in this portion of the measure similar to the first study. The numerical-answer questions asked how many times the participant drank over the binge drinking limit in a single session and how many days they drank more than the limit. The participants were also asked to describe the binge drinking situation, if one had occurred, as much as possible including reason and location. A comment section was made available on both time 1 and time 2 questionnaires for the participants to ask questions, express concerns or to simply make statements. Again, as in the first study, two items regarding whether the participant drank alcohol in the last week but less than the binge drinking limit (I drank alcohol in the last week but not more than 4/5 alcoholic drinks in a single session: definitely no/definitely yes; and In the last week, I stopped drinking before I was drunk: definitely no/definitely yes) were excluded from the scale during analysis as removing them improved the reliability of the self-report binge drinking behaviour measure. The Cronbach's alpha for the behaviour scale was .89 and a higher behaviour score indicated greater occurrence of binge drinking in the previous week.

6.3.3.4 Intention

Intentions were measured using the same 7-point scales as the first study including: 'I intend to participate in at least one binge drinking session in the next week (strongly agree - strongly disagree)'; 'I would like to binge drink in the next week (definitely no - definitely yes)'; and 'In the next week do you intend to stop drinking before you are drunk (definitely no - definitely yes).' The item 'I plan to drink less than 4/5 alcoholic drinks in a single session in the next week (definitely agree - definitely disagree)' was again like in the first study excluded from the scale as

the inter-item correlations were low and the alpha was improved by its removal. The Cronbach's alpha for the intentions scale with the eight remaining items was .94 and higher scores were indicative of greater intentions to binge drink in the next week.

6.3.3.5 Attitude

Explicit attitudes towards binge drinking were measured in the same way as the first study on five 7-point semantic differential scales. The students were asked to indicate how they felt about drinking alcohol on the following bipolar dimensions: bad to good, unpleasant to pleasant, enjoyable to unenjoyable, foolish to wise and harmful to beneficial. Scales were labelled at either end with the attitude labels and numbers representing the mid-points of the scales. The Cronbach's alpha for this scale was .87 and higher scores were indicative of more positive attitudes towards binge drinking.

6.3.3.6 Subjective Norm

Subjective norms were measured in the same way as the first study by asking the students to indicate to what extent their close friends approved of their drinking alcohol on a 7-point scale. They also rated the importance they placed on the opinions of significant others (1 = not at all important, 7 = very important) though these were not included in the subjective norms scale. The Cronbach's alpha for the scale was .88 and higher scores were indicative of greater normative support or perceived approval of binge drinking from best friends and significant others.

6.3.3.7 Perceived Behavioural Control

Perceived behavioural control was assessed by three items addressing the students' ability to resist peer pressure to consume alcohol as in Williams and Hine (2002). 'Whether I do or do not binge drink is entirely up to me'; 'How much control do you feel you have over binge drinking in the next week?'; 'I would like to binge drink in the next week but I don't really know if I can.' The third item was excluded from the scale as the alpha was significantly improved by its removal. The Cronbach's alpha for PBC was .87 and higher scores were indicative of greater perceived control over binge drinking in the next week.

6.3.3.8 Habit

Habit was measured using the same Self-Report Habit Index used in the first study. There were twelve questions relating to three characteristics of habitual action where the participants rated their (dis)agreement: automaticity (e.g. [Drinking is something...] I have no need to think about doing), frequency (e.g. ...I do frequently), and relevance to self-identity (e.g. ...that's typically

me). The Cronbach's alpha for habit was .91 and higher habit scores indicated greater binge drinking habit strength.

6.3.3.9 Impulsivity

Impulsivity was measured using the same 45 question UPPS impulsive behaviour scale used in the previous study (Whiteside & Lynam, 2001). It consisted of four subscales: urgency (12 items), lack of premeditation (11 items), lack of perseverance (10 items), and sensation seeking (12 items) with a Likert-type 7-point scale. The Cronbach's alphas for urgency was .85 and higher score indicated a greater tendency to give into strong impulses when distressed. The Cronbach's alphas for lack of premeditation was .91 and higher score indicated a greater tendency to give little attention to the potential outcomes of behaviour. The Cronbach's alphas for lack of perseverance was .87 and higher score indicated a greater tendency to be easily distracted. Finally, the Cronbach's alphas for sensation seeking was .91 and higher score indicated a greater preference for excitement and stimulation.

6.3.3.10 Social identity

The social identity constructs were measured in the same way as the first study through UEA identification, group norms and self-identity.

6.3.3.10.1 UEA identification and group norms

UEA identification (13 items) and group norms (12 items) were assessed using measures adapted from K. Johnston and White (2003) such as: 'How much do you feel you identify with other UEA students?'; 'With respect to your general attitudes and beliefs, how similar do you feel you are to other UEA students?'; 'Is drinking alcohol something university students do often?'; and 'In general, how well do you feel you fit in with other UEA students.' All items were measured on a 7-point scale ranging from 1-7 with labels at either end. The Cronbach's alpha for UEA identity was .94 and higher UEA identity scores indicated stronger identification as a UEA undergraduate. The Cronbach's alpha for group norms was .90 and higher group norms scores indicated greater perceptions that binge drinking was part of being a typical university student.

6.3.3.10.2 Self-identity

Self-Identity was measured using 2 items adapted from Hagger and Chatzisarantis (2006): "Drinking more than 4/5 alcoholic drinks in a single session in the next week is an important part of who I am"; and "I think of myself as the type of person who would drink more than 4/5 alcoholic drinks in a single session in the next week". Both of these used a 7-point scale ranging

from 1 to 7. The Cronbach's alpha for self-identity was .75 and higher self-identity scores indicated stronger identification as someone who binge drinks.

6.3.3.11 Descriptive norms

Descriptive norms were measured in the same way as study 1 using 2 items adapted from Ravis and Sheeran (2003) using a 7-point Likert scale. The 2 items were: 'How often does your best friend have at least one drink of alcohol in a week?' and 'How often does your best friend binge drink in a week?' The Cronbach's alpha for descriptive norms was .86 and higher scores indicated greater perceptions of binge drinking as a peer normative behaviour.

6.3.4 Procedure

After arriving at the lab at the appointed/selected time, the participants sat at a computer and were given a participant number, briefing sheet and consent form to sign. The participants hit 'spacebar' to continue and take part. Assignments to the four groups were random and counterbalanced. For the first 3 groups, brief instructions came up stating, 'Please read the following articles and comment on the writing style of each.' There was a text box for them to leave their comments situated below each article. They pressed 'spacebar' to continue. This portion took approximately 15 minutes to complete.

Table 6.2 - Overview of the Alcohol-identity IAT employed in this study

Block		N trials	Left key	Right key
1	Training 1	20	Alcohol	Water
2	Training 2	20	Not me	Me
3	Incongruent 1	20	Alcohol + Not me	Water + Me
4	Incongruent 2	40	Alcohol + Not me	Water + Me
5	Training 3	20	Water	Alcohol
6	Congruent 1	20	Water + Not me	Alcohol + Me
7	Congruent 2	40	Water + Not me	Alcohol + Me

Participants pressing ‘spacebar’ were then lead to a screen with brief instructions on how to complete the implicit associations tests on alcohol (this is where the 4th group began their sessions). All groups and participants were asked to complete both IATs first the AI-IAT followed by the arousal IAT. The participants were told that positive and negative words, and names of alcoholic drinks and soft drinks would be presented one by one on the screen and the task would be to press a left (Q) or right (P) key based on the category to which the words belonged (alcohol or soft drink/positive or negative). The category was assigned to response, varying from block to block. Details of the alcohol-identity IAT can be found in Table 6.2 while Table 6.3 shows the details of the arousal IAT.

Table 6.3 - *Overview of the Arousal IAT employed in this study*

Block		<i>N</i> trials	Left key	Right key
1	Training 1	20	Alcohol	Soft drink
2	Training 2	20	Positive	Negative
3	Incongruent 1	20	Alcohol + Positive	Soft drink + Negative
4	Incongruent 2	40	Alcohol + Positive	Soft drink + Negative
5	Training 3	20	Soft drink	Alcohol
6	Congruent 1	20	Soft drink + Positive	Alcohol + Negative
7	Congruent 2	40	Soft drink + Positive	Alcohol + Negative

Block 1 consisted of 20 trials; each positive and negative item was presented twice. In Block 2, each alcohol and soft drink item was presented twice in 20 trials. Block 3 consisted of 20 trials combining blocks 1 and 2. Block 4 repeated Block 3, but with 40 trials. Block 5 reversed the side of the screen each associated category was displayed and, like Block 2, showed alcohol and soft drink items. Then, Block 6 and 7 followed on the same as Blocks 4 and 5. During each block, the labels of the categories that were assigned to the left key will be presented in the top left corner whereas the labels of the categories that were assigned to the right key will be displayed in the top right corner of the screen. The order of the trial was randomized for each block of trials and each participant separately. Each trial started with the presentation of an item at screen centre until a

valid response was given. The next trial started 400ms after a response. There were no error response feedback messages given. Both IATs were methodologically identical but the self- and other-relevant words were replaced with good and bad words; and the representative pictures of alcohol and water were replaced with alcohol and soft drink related words. The IAT portion of the experiment took approximately 20 minutes. Both IATs were counterbalanced. After they were offered time to take a break by an onscreen prompt, they pressed 'spacebar' to continue. This was then followed by an expanded TPB questionnaire where participants pressed a number between 1 and 7 to indicate their responses to each question as it appeared on the screen. This time 1 TPB questionnaire took approximately 10 minutes. Upon reaching the end of the questionnaire, the participants were given a debriefing sheet thanking them for participation and providing information about safe drinking practice and sources of support for any who may be concerned about alcohol use. The participants were also asked to provide an email contact to receive a reminder 24 hours in advance of the time-2 questionnaire. The reminder email contained the link to the time-2 questionnaire. They were explicitly informed that completion of both time 1 and time 2 questionnaires was required in order to be entered into the random prize draw of a single £250 Amazon voucher and that any contact information provided by the them would be stored separately from the data and destroyed after the reminder message had been sent. The exception to this was the participants assigned to manipulation one (suggesting that students drink more), as they were fully debriefed at the end of time 1. They were told in the time 1 debrief that students do not drink terribly much and that people think others drink more than they actually do. This was done as not to risk increasing the drinking prevalence in the participants. In total, the first portion took approximately 45 minutes to complete.

One week after completing the first questionnaire, the participants followed the link for the time-2 questionnaire provided to them via email. They were taken to the information screen. After reading the instruction and information, they then chose 'continue' at the bottom of the page to take part or closed the window to exit. The participants selecting 'continue' were taken through to complete the questionnaire items. At the bottom of each screen the participants chose 'next' to continue or 'back' to move to a previous page. They were free to move backwards and forwards through the questionnaire and all questions were optional. Participants could have chosen to leave some of the questions unanswered. This did not keep them from submitting when they finished. Upon reaching the end of the questionnaire, the participants were taken to a screen stating that if they were happy with the data they had provided to be used then they should select 'submit' but that if they did not wish to submit their data they could exit by closing the window. After selecting 'submit' the participants were taken to a prize draw entry form separate from the questionnaire where they could provide their email for entry if they chose. By clicking 'next' on this screen, they were taken to a debriefing screen thanking them for participation and provided information about safe drinking practice and sources of support for any who might have been concerned about

alcohol use. The time-2 questionnaire took approximately 5 minutes to complete. Those choosing to participate were able to complete time 1 starting in September 2013 and any time before 30th March 2014. Only those providing contact details at time 1 were provided the link for the time-2 questionnaire in the email reminder. Using the emails provided during the time-2 questionnaire, a randomly selected participant was drawn to win £250 of Amazon vouchers. A participant was only eligible for the prize draw if they had completed both time 1 and time 2 questionnaires. This rule was clearly stated to the participants before they took part in any of the research. The winner was contacted and arrangements were made to collect their prize. After collection, all contact details for all participants were deleted. Electronic data was password protected and was stored on a memory stick in a locked filing cabinet in a restricted access room in Elizabeth Fry Building.

6.4 Results

6.4.1 Overview of results

This section will discuss the results in relation to the identity association intervention, implicit alcohol-identity, implicit arousal and the expanded TPB predicting binge drinking behaviour. Preliminary analysis were completed to account for missing and outlying data before conducting correlations and regression analysis and the results will be reported in order of hypotheses listed. This section will begin with descriptive and correlational data of the measures used. Table 6.4 shows the descriptive data and Table 6.5 the correlational data for the TPB components, habit, impulsivity, social identity components and the IATs. Then, there are comparisons of the experimental groups followed by data pertaining to the predictive utility of the TPB. Results for the IATs including how they were scored are discussed. Multiple hierarchical forced linear regressions of the IATs, TPB measures, descriptive norms, habit, impulsivity and social identity onto intentions and intentions, IATs and habit onto self-reported binge drinking behaviour are presented (shown in Table 6.7 and Table 6.8).

6.4.2 Preliminary analysis

As in the first study, the goal for sample size was to have a minimum of 80 participants. Tests for normal distribution were run using skewness and kurtosis values. Assessments of visual aids such as graphs and data were checked for outliers. At time 1, the sample included 122 participants with an attrition rate of 10% retaining 110 participants for time 2 meeting the minimum required participants overall. Convergent validity of measures were assessed by examining inter-correlation of items measuring the same variable (see table 6.4 for Cronbach's alpha of each variable). With a functionally sufficient test of discriminant validity set at correlations not exceeding $r=.85$ as used in the previous study, all of the variables met the requirements (see Table 6.5 for correlations of all variable). Findings for distribution of each variables were similar to the first study and the data here was treated in the same way where regression analysis was conducted with the original untransformed data. To determine if there were significant differences between those participants

completing both time 1 and time 2 questionnaires and those only taking part in time 1, independent samples t-tests were run to identify any significant mean differences between the two groups. The results showed that all variables had no significant differences in means except for UEA identity where those completing both time 1 and time 2 had a mean of 4.95 and those only completing time 1 had a mean of 5.71. As only 12 participants did not return to complete the time 2 questionnaire, a small group compared to those who completed both (n=110), a small difference in scores could have changed the mean making the group comparisons less reliable. The 12 participants' data is included in all of the analysis with the exception of the regression analysis for binge drinking behaviour.

6.4.3 Descriptive data

Table 6.4 - Means, standard deviation and Cronbach's Alphas for all variables. All scales ranged from 1-7 (with the exception of both IATs which were measured on a continuous scale).

	Alphas	Mean	SD
Intentions	.94	3.6	1.8
Attitude	.87	3.5	1.4
Subjective Norms	.88	3.4	1.6
PBC	.87	6.4	0.9
Descriptive Norms	.86	4.8	1.8
Habit	.91	2.5	1.3
Imp – Premeditation	.91	5.1	1.0
Imp – Urgency	.85	3.4	1.0
Imp – Sens Seeking	.91	4.5	1.4
Imp – Perseverance	.87	5.0	1.1
UEA Identity	.94	5.0	1.2
Self-Identity	.75	2.5	1.4
Group Norms	.90	5.6	0.8
Behaviour	.89	2.0	1.4
AI-IAT		0.67	1.3
Arousal IAT		0.75	1.3

Descriptive data for all variables are shown in Table 6.4. Overall, participants reported neutral explicit attitudes towards binge drinking and subjective norms were similar. They reported having quite high perceptions of control over binge drinking and a slightly higher proportion of participants had intentions to binge drink in the next week. Young people reported stronger descriptive norms regarding binge and higher impulsivity scores. Habit scores were low as were the self-identity scores. Group norms and UEA were high. Cronbach's Alphas for all scales had alphas above .70.

6.4.4 Correlations of variables

Table 6.5 features the bivariate correlations of all the variables of interest (intentions, PBC, subjective norms, habit, UEA identity, group norms, self-identity and impulsivity). It does not include the AI-IAT or arousal IAT scores as they did not correlate with any other variable other than each other ($r = .45, p < .01$).

Table 6.5 - *Bivariate correlations for self-reported binge drinking behaviour, TPB components (intentions, attitude, subjective norms and perceived behavioural control), habit, impulsivity (lack of premeditation, urgency, sensation seeking and lack of perseverance), UEA identity, group norms, self-identity, and descriptive norms.*

	Int	Att	SN	PBC	Habit	Imp-Pr	Imp-U	Imp-SS	Imp-Pe	UEA-ID	GN	SI	DN
BEH	.66**	.33**	.19*	-.25**	.58**	-.29**	.19*	.20*	-.30**	.39**	.10	.67**	.32**
INT		.63**	.44**	-.29**	.64**	-.24**	.15	.16	-.23*	.42**	.24*	.80**	.41**
ATT			.57**	-.16	.42**	-.20*	-.10	.12	-.19*	.27**	.25**	.47**	.34**
SN				-.17	.29**	-.10	.02	.08	-.09	.21*	.35**	.33*	.31**
PBC					-.26**	.13	-.25**	-.03	.21*	-.17	-.02	-.29**	-.05
HAB						-.30**	.34**	.17	-.17	.34**	.16	.72**	.35**
Imp-Pr							-.11	-.41**	.47**	-.06	-.07	-.35**	-.03
Imp-U								.13	-.02	.11	.09	.24**	.08
Imp-SS									-.17	.10	.11	.20*	-.04
Imp-Pe										-.08	.07	-.20*	-.15
UEA ID											.09	.38**	.19*
GN												.22*	.18*
SI													.37**

**Correlation significant at the 0.01 level, *Correlation significant at the 0.05 level (2-tailed)

Attitude ($r = .63, p < .01$), subjective norms ($r = .44, p < .01$) and PBC ($r = -.29, p < .01$) all correlated with intentions to binge drink as the theory postulates. Intentions, PBC, subjective norms, attitude, habit, all components of impulsivity, UEA identity and self-identity were correlated with binge drinking behaviour ($p < .05$). Intercorrelations among these variables were also present, although they did range from small effect size associations (subjective norms and UEA identity) to large associations (habit and intentions).

6.4.5 Identity manipulations – hypothesis 1 and 2

A One-way Analysis of Variance (ANOVA) was used to examine the question of whether university undergraduates, after participating in an identity manipulation, would report differently on expanded TPB variables, namely explicit attitudes and identity measures, and IATs in regards to binge drinking. The four groups included the two identity groups (in-group and out-group), the health campaign (alcohol has negative impacts on health) and a control with no information on alcohol or identity. The hypotheses stated that the in-group/out-group comparisons should be significantly different. The ANOVA compared means for all the expanded TPB model variables (with a range of 1 to 7) and the two IATs (with a range of -3.29 to 4.70). The descriptive statistics for all variables including sample size, means and standard deviation by group are shown in Table 6.6.

Considering the between groups comparisons, the ANOVA was run to examine whether group means differed. The assumption of independence was met as random sampling was used to select university students and assign them to each of the four groups. Levene's test, run to assess equal variances across samples, were significant for intentions ($p < .001$), subjective norms ($p < .05$), descriptive norms ($p < .05$), PBC ($p < .01$) and the AI-IAT ($p < .001$).

For all other remaining variables, the assumptions that the variances of the groups were not significantly different were met. Welch's F are reported for the variables with significant Levene's scores. The ANOVA showed a significant effect of identity manipulation on attitude [$F(3, 118) = 6.4, p < .05$] and intention [Welch's $F(3, 64.7) = 4.13, p < .05$]. We can conclude that at least two of the four manipulation groups differed significantly on their average scores for attitude and intentions. For attitude, approximately 28% ($r = .28$) of the total variance was accounted for by the identity manipulation. Approximately 27% ($w = .27$) of the total variance in intentions was accounted for by the identity manipulation. Further analysis to assess which of the four groups significantly differed from each other were run for both of these variables and are discussed in the following sections.

Table 6.6 – *Descriptives including N, means, standard deviation for all variables of interest by experimental group (control, health campaign, out-group, in-group). All scales ranged from 1-7 with the exceptions of both IATs.*

DV	Group	N	Mean	SD
Behaviour	Control	26	2.4	1.4
	Health	25	2.1	1.5
	Out-group	30	1.7	1.5
	In-group	29	1.8	1.2
AI-IAT	Control	28	1.0	1.9
	Health	28	0.7	0.8
	Out-group	33	0.6	1.2
	In-group	33	0.7	1.0
Arousal IAT	Control	28	0.6	1.3
	Health	28	0.5	1.3
	Out-group	33	0.7	1.1
	In-group	33	0.7	1.5
Attitude	Control	28	4.2	1.1
	Health	28	3.2	1.4
	Out-group	33	3.3	1.4
	In-group	33	3.3	1.5
Subjective Norms	Control	28	3.7	1.3
	Health	28	3.3	1.9
	Out-group	33	3.5	1.7
	In-group	33	3.1	1.5
Descriptive Norms	Control	28	5.3	1.4
	Health	28	4.9	1.7
	Out-group	33	4.4	2.2
	In-group	33	4.6	1.7
UEA Identity	Control	28	5.4	0.9
	Health	28	5.0	1.3
	Out-group	33	4.6	1.4
	In-group	33	5.1	1.0
Self-Identity	Control	28	3.1	1.4
	Health	28	2.3	1.1
	Out-group	33	2.4	1.5
	In-group	33	2.2	1.4

6.4.5.1 Attitude group comparisons

Tukey HSD post hoc procedure was used as the homogeneity of variance assumption were met for the attitude variable. Using an a priori alpha level of .05 for the comparisons, the control vs. the health campaign (mean difference = 1.000) is significant, $p < .05$. The control vs. the out-group (mean difference = 0.934) is significant, $p < .05$. The control vs. the in-group (mean difference = 0.892) was not significant but marginal, $p = .063$. The health campaign vs. the out-group (mean difference = 0.066) was not significant, $p = .998$. The health campaign vs. the in-group (mean difference = 0.108) was not significant, $p = .990$. The in-group vs. the out-group (mean difference = 0.042) was not significant, $p = .999$.

6.4.5.2 Intentions group comparisons

Games-Howell post hoc procedure was used as the homogeneity of variance assumption were not met for the intention variable. Using an a priori alpha level of .05 for the comparisons, the control vs. the health campaign (mean difference = 1.013) is significant, $p = .050$. The control vs. the out-group (mean difference = 1.025) is not significant, $p = .077$. The control vs. the in-group (mean difference = 1.075) was not significant but marginal, $p = .053$. The health campaign vs. the out-group (mean difference = 0.012) was not significant, $p = 1.0$. The health campaign vs. the in-group (mean difference = 0.061) was not significant, $p = .999$. The in-group vs. the out-group (mean difference = 0.049) was not significant, $p = 1.0$.

6.4.5.3 Summary of ANOVA findings

These results indicated the control group ($M = 4.2$, $SD = 1.1$) had a significantly higher average explicit attitude score than the health campaign group ($M = 3.2$, $SD = 1.4$) and the out-group association ($M = 3.3$, $SD = 1.4$). In regards to undergraduates intentions to binge drink in the next week, the control group ($M = 4.4$, $SD = 1.2$) had significantly higher self-reported intention scores than the health campaign group ($M = 3.4$, $SD = 1.7$). Overall, there were no differences between the in-group and out-group identity associations therefore providing no support for hypotheses 1 and 2.

6.4.6 Implicit cognitions identity and arousal scores

IAT effects were calculated using the improved scoring algorithm of Greenwald et al. (2003) and D -scores were calculated for both the Alcohol Identity IAT and Arousal IAT measures. On average, participants produced positive AI-IAT scores, indicating relatively greater association of the congruent blocks of 'alcohol and me' compared to the incongruent blocks of 'water and me.' They also produced positive arousal IAT scores suggesting relatively greater association of 'alcohol and good' compared to 'non-alcohol and good.'

A one sample t-test showed that the arousal IAT effect was significant ($t(121) = 5.60, p < 0.001$) and was moderate to strong ($D = 0.67$). The mean reaction times on trials for the arousal IAT was 761 (SD = 192) in Task 1 or congruent task (press left for alcohol and good; press right for non-alcohol and bad) and 891 (SD = 265) in Task 2 or incongruent task (press left for non-alcohol and good; press right for alcohol and bad). This data provided evidence for strong alcohol-arousal associations. This arousal IAT effect was not correlated with the explicit measure of attitudes towards binge drinking in the TPB and did not contribute to the prediction of binge drinking intentions but importantly appeared as a predictor of binge drinking behaviour (Table 6.8) which is discussed further in section 6.1.8.

A one sample t-test showed that the alcohol identity IAT effect was also significant, ($t(121) = 6.60, p < 0.001$) and was moderate to strong ($D = 0.75$). The mean reaction times on trials for the alcohol identity IAT was 677 (SD = 159) in the congruent task (press left for alcohol and me; press right for water and not me) and 804 (SD = 233) in non-congruent task (press left for water and me; press right for alcohol and not me). This data suggested participants associated alcohol more with the self in comparison to others. The alcohol identity IAT effect did not contribute to the prediction of binge drinking intentions or behaviour (Table 6.7 and Table 6.8).

6.4.7 Predicting binge drinking intentions – hypothesis 3

Forced entry hierarchical multiple linear regression analysis was used to predict intention to engage in a binge drinking session over a week (Table 6.7). The variables were entered into six blocks in a similar fashion to study 1. These blocks were: (1) attitude, subjective norms and PBC, (2) AI-IAT and arousal IAT, (3) descriptive norms and habit, (4) impulsivity (premeditation, urgency, sensation seeking and perseverance), (5) SIT (UEA identity and group norms), and (6) self-identity.

The TPB variables were able to explain 43% of the variance in binge drinking intentions (adjusted $R^2 = .42, F(5, 116) = 18.07, p < .001$). Attitude and PBC had significant beta weights. The AI-IAT and the arousal IAT did not explain a significant amount of additional variance. The addition of habit and descriptive norms at step 3 produced a significant increase of 16% in the amount of variance explained (adjusted $R^2 = .57, F(7, 114) = 24, p < .001$) in binge drinking intentions to 60%. Attitude and habit had significant beta weights at this step. The addition of the impulsivity components at step 4 did not produce a significant increase in the amount of variance explained. Attitude and habit maintained significant beta weights. In step 5, UEA identity appeared as a significant predictor of intentions alongside attitudes and habit explaining an additional 2% of variance (adjusted $R^2 = .58, F(13, 108) = 13.71, p < .05$) to a total of 62%. And finally at step 6, self-identity was a significant predictor of intentions to binge drink and produced a significant increase in the amount of variance explained by 13% (adjusted $R^2 = .72, F(14, 107) = 22.94, p$

< .001). Attitude did remain significant alongside self-identity but importantly habit and UEA identity did not. The full model explained 75% of the variance in intentions to binge drink over a one week period.

Results for the regression analysis predicting binge drinking intentions using an alcohol identity IAT, an arousal IAT, attitudes, subjective norms, PBC, impulsivity, habit, UEA identity, group norms, self-identity and descriptive norms can be found in Table 6.7

Table 6.7 - Predicting binge-drinking intentions using AI-IAT, arousal IAT, TPB variables, impulsivity, habit, SIT (UEA identity and group norms) and self-identity (N=122).

Variable - Step 1	Beta					
	Step 2	Step 3	Step 4	Step 5	Step 6	
1 Att	0.54***	0.55***	0.37***	0.36***	0.34***	0.26***
PBC	-0.18**	-0.19**	-0.11	-0.10	-0.10	-0.04
SN	0.10	0.10	0.06	0.06	0.03	0.04
2 AI-IAT	-0.07	-0.03	-0.03	-0.03	-0.03	-0.01
Arousal IAT	0.07	0.02	0.02	0.02	0.06	0.05
3 DN		0.12	0.12	0.11	0.11	0.04
Habit		0.40***	0.39***	0.36***	0.36***	0.08
4 Imp – Pre			0.02	0.01	0.01	0.10
Imp – Urg			0.01	0.00	0.00	-0.01
Imp – SS			0.05	0.03	0.03	0.02
Imp – Pers			-0.04	-0.05	-0.05	-0.07
5 UEA ID				0.16*	0.16*	0.09
GN				0.07	0.07	0.03
6 SI						0.57***
R ² Adj	0.42	0.41	0.57	0.56	0.58	0.72
Change	0.43***	0.01	0.16***	0.00	0.02	0.13***

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

6.4.8 Predicting binge drinking behaviour – hypothesis 4

To assess predicting binge drinking at time 2, a second forced entry hierarchical multiple linear regression was performed in the same way as the first study with the addition of the implicit measures and the variables entered into two blocks. First, variable expected to predict self-reported

binge drinking behaviour were entered in block 1: intentions, PBC, AI-IAT, arousal IAT impulsivity variables (lack of premeditation, urgency, sensation seeking and lack of perseverance) and habit. Second, the remaining variables were entered in block 2: explicit attitudes, subjective norms, descriptive norms, UEA identity, group norms and self-identity. The details for this regression can be found in Table 6.8.

Table 6.8 - *Predicting self-reported binge drinking behaviour using intentions, PBC, AI-IAT, arousal IAT, impulsivity, habit, explicit attitudes, subjective norms, descriptive norms, UEA identity, group norms and self-identity (N=110).*

		Beta	
		Step 1	Step 2
1	Intentions	0.48***	0.36**
	PBC	-0.02	-0.03
	AI-IAT	0.05	0.11
	Arousal IAT	-0.17*	-0.20*
	Imp – Pre	-0.07	-0.05
	Imp – Urg	0.05	0.00
	Imp – SS	0.03	0.05
	Imp – Pers	-0.10	-0.09
	Habit	0.20*	0.12
2	Att		-0.10
	SN		-0.08
	DN		0.11
	UEA ID		0.10
	GN		-0.09
	SI		0.26
	R ² Adj	0.48	0.51
	Change	0.52***	0.06

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

At step 1, 52% of the variance in binge drinking behaviour (R^2 adjusted = .48, $F(9, 100) = 11.97$, $p < .001$) was explained and intentions, arousal IAT and habit significantly added to the model at this stage. At step 2 none of the remaining variables contributed to the amount of variance explained in self-reported binge drinking behaviour though the arousal IAT maintained significance alongside intentions. Overall, the whole model explained 57% of the variance in self-reported binge drinking behaviour.

6.4.8.1 Summary of an expanded TPB predicting binge drinking intentions and behaviour

Young people's attitudes and PBC significantly predicted intentions to binge drink over a one week period initially but when the TPB was expanded to include additional variables attitude remained the only significant predictor. Of the additional variables, habit, UEA identity and self-identity significantly increased the amount of variance explained. When the entire expanded model was considered, only self-identity was a significant predictor alongside attitude. These were very similar findings to the first study though we did not see UEA identity as a significant predictor in this second study. Self-reported binge drinking behaviour was predicted by implicit arousal associations and intentions. The findings will now be discussed in the following section.

6.5 Discussion

The present study examined if identity based interventions could affect antecedents of decisions to binge drink, namely attitudes and identity constructs, and how implicit association measures would contribute to explaining binge drinking behaviour. It also applied an expanded theory of planned behaviour (TPB) containing separate measures of habit, impulsivity and social identity constructs to the prediction of binge drinking intentions and behaviour among a sample of undergraduate students over a 1-week period. The study used a widely diverse sample even among such a specific group of undergraduates at UEA by including participants from different schools, years, social and economic backgrounds, ages and cultures. As in Study 1 of this thesis, analyses were run with intentions and behaviour data unaltered as transforming did not normalise distribution. The results regarding the identity manipulations will be discussed first, followed by implicit associations and the expanded TPB results. The section and chapter will then finish with the conclusions.

6.5.1 Identity manipulations

A One-way Analysis of Variance (ANOVA) of the manipulation groups (control, health campaign, in-group and out-group) did appear to have an effect for two of the variables tested: attitude ($F(3,118) = 6.4, p < .05$) and intentions (Welch's $F(3, 64.7) = 4.13, p < .05$). Post hoc analysis showed the participants in the control group, with no identity or health information, reported more positive explicit attitudes than the participants in the health campaign and the out-group association but not the in-group association. The health campaign and out-group identity manipulation were different from the control ($r = .28$) but not each other and, as they both shared a general alcohol negative health impact message, the difference in explicit attitudes were likely due to the awareness of the impacts of alcohol and not to identity associations. Even with the in-group association nearly reaching significance ($p = .063$) when compared to the control it was not significantly different from the out-group ($p = .999$) suggesting further that identity did not play of a role in changing explicit attitudes. Participants in the control group also reported having

greater intentions to binge drinking over the next week compared to those in the health campaign group ($p = .05$) but neither the out-group nor the in-group identity associations (though they did approach significance with $p = .077$ and $p = .053$ respectively). This suggested that the health campaign was slightly more effective at reducing intentions to binge drink over the next week compared with identity associations even though the three did not differ from each other significantly on intentions. The findings regarding the identity manipulation did not support hypothesis 1 and 2 which was contrary to other findings such as Berger and Rand (2008) where they found identity associations could influence a wide variety of health. The contrasting results could be due to some methodological or design issue which will be discussed in the conclusion section. It is also possible that regarding binge drinking in particular, identity associations are less effective at influencing the decision making process than other health related behaviours or even other alcohol consumption behaviours (e.g. drinking with a meal).

6.5.2 **Implicit associations and alcohol**

This study also investigated the contribution of implicit alcohol-related associations in predicting binge drinking. The mean reaction times on trials for the arousal IAT in Task 1 (press left for alcohol and good; press right for non-alcohol and bad) was quicker than in Task 2 (press left for non-alcohol and good; press right for alcohol and bad), which suggested that participants had more favourable automatic associations toward 'alcohol and good' than 'non-alcohol and good.' The mean reaction times on trials for the alcohol identity IAT in Task 1 (press left for alcohol and me; press right for water and not me) was quicker than in Task 2 (press left for water and me; press right for alcohol and not me), which suggested that participants associated alcohol more with the self than they did water. The arousal IAT was a consistent predictor of unique variance in binge drinking similar to Lindgren, Foster, Westgate, and Neighbors (2013) but the AI-IAT findings did not match as we did not find them to be predictive.

6.5.3 **TPB predicting binge drinking intentions**

To address hypothesis 3, the TPB was partially found to be predictive of intentions to engage in a binge drinking session over a week, explaining 43% of the variance in intention scores with attitude and perceived behavioural control emerging as significant predictors. These results were broadly in line with Study 1 and other previous applications of the TPB in relation to alcohol consumption, which have found the TPB to predict between 39% and 46% of the variance in alcohol use intentions (Armitage, Conner, Loach, & Willetts, 1999; K. Johnston & White, 2003; Norman & Conner, 2006). Previous studies have also shown all components of the TPB to be predictive of alcohol use intentions (Conner & Armitage, 1998; McMillan & Conner, 2003b) but subjective norms did not appear in this study as a significant predictor of intentions leading to the rejection of hypothesis 3(b). This was in line with the findings of Study 1 and Cooke et al. (2007).

As in Study 1, a negative relationship was found between PBC and intentions. This suggests low perceptions of control were associated with strong alcohol-use intentions. This effect also appeared in both correlation and regression analyses, suggesting that it was not merely a statistical artefact (Norman & Conner, 2006). An interesting finding in this study that was different from Study 1 was that PBC was actually a predictor of binge drinking intentions at step 2 of the model supporting hypothesis 5(c).

Explicit attitudes appeared as a significant predictor of binge drinking intentions again supporting hypothesis 5(a). This finding was similar to that of Study 1 and further supports attitudes as the main predictor of intentions in the TPB. More positive explicit attitudes towards binge drinking were associated with: greater intentions to binge drink in the next week; believing significant others are more likely to approve of the participant's binge drinking and binge drink themselves; viewing binge drinking as part of the UEA student identity and their own identity; and higher levels of self-reported binge drinking behaviour.

6.5.4 Additional variables predicting binge drinking intentions

6.5.4.1 Normative measures as part of the expanded model

Interestingly, descriptive norms and group norms were not significant predictors of intentions to binge drink. When considering the overall model, this leads to rejecting hypotheses 6(a) and 6(e). The correlations of descriptive norms with intentions ($r = .41$) does support other research (McMillan & Conner, 2003b) showing the importance of salient others perceived alcohol use. For example, Marcos, Bahr, and Johnson (1986) found that having drug-using friends was the best predictor of drug use out of parental, religious and educational attachment, conventional values and drug-using friends. Though McMillan and Conner (2003b) found other normative measures such as moral norms and injunctive norms were not significant predictors of intentions to use alcohol, it was important to consider different forms of normative influences within the context of the TPB as descriptive norms appeared to be a possible normative predictor in relation to intentions to binge drink. Future theoretical development could consider different sources of normative influences impacting intentions for example the importance of behaviour to group identity playing an important role in determining the injunctive influence of that group. This could be of use in any interventions designed to alter drinking behaviours in young people. The findings that norms did not predict intentions is interesting as Beck and Ajzen (1991) stated that attitudes, subjective norms and PBC vary in their importance depending on the behaviour. It is possible that subjective, descriptive and group norms are not important predictors of binge drinking though it is unlikely they have no impact. As Cooke et al. (2007) show, it may also be possible that participants were confused about whose approval they were being asked about where participants sometimes struggle to answer items which use the phrase 'most people who are important to me' partly

because there could be a disagreement between important people (e.g. friends wanting to drink and parents who do not). The norm measures were significantly positively correlated but lacked predictive utility. A suggestion to improve the measurement would be to ask the participant to specifically identify who in their life is important to them and then answer the questions based on whom they identified. Several norm measures were tested in this instance though and not all were measured in the same way using significant others so their failure to predict intentions may not only be due to problems with measurement but also possibly due to number of participants or participants unwillingness to report peer influences affecting behaviour.

6.5.4.2 Impulsivity and the TPB

In contradiction with the findings in Study 1 and Churchill et al. (2008) where lack of premeditation, and to some degree urgency and sensation seeking, were predictive of intentions and behaviour, none of the individual impulsivity components contributed to the prediction of binge drinking intentions or behaviour over and above the extended TPB model. Another discrepancy is that lack of premeditation and perseverance scales of impulsivity appeared as significantly negatively correlated with self-reported binge drinking behaviour in Study 2 but not 1, meaning those less likely to give attention to potential outcomes of behaviour and be easily distracted reported higher levels of binge drinking. Impulsivity was measured in the same way in both studies though the group manipulations did significantly affect perseverance particularly for the identity groups compared to the control and the health campaigns. This suggested that identity played some role in changing participants' responses to how easily distracted they reported being. The research findings have a number of important theoretical implications. Mainly, suggesting that for some risky health behaviours such as binge drinking, measures that assess the extent to which people act on impulse may not be an important independent predictor of behaviour and intentions when considered alongside other factors that reflect a more deliberative processing model but can be influenced by identity salience.

6.5.4.3 Habit as an additional construct

Habit strength significantly increased the amount of explained variance in binge drinking intentions by 16% supporting hypothesis 6(b). This was in line with Study 1 and other research supporting habit strength having an additive effect in health related behaviours and intentions (de Bruijn et al., 2008; de Bruijn & Rhodes, 2011; Gardner et al., 2011). Those with higher habit strength had greater intentions to binge drink in the next week. When considered as part of the complete expanded model it was no longer predictive of intentions. Though the habit construct was partially supported in this data, the practical application needs consideration. Previous studies (Verplanken & Aarts, 1999; Verplanken & Melkevik, 2008) suggested that environmental aspects play a key role. Habits are conceived as behavioural responses brought on by environmental cues and having a highly salient environment for binge drinking (e.g. party or on a night out, friends

who drink) may be key for habit formation. They are also thought to stem from behaviours with reinforcing properties and ease of access. Therefore, it could be that drinking may be reinforcing for some if alcohol is readily available, reduces anxiety and boosts their confidence. Habit and identity significantly increased the explained variance of binge drinking intentions showing that elements of automaticity affect intentions. As many health behaviours are repetitive and can lead to the formation of habits and self-identification, habit and identity are similar and while strongly correlated they were not markers of a unitary latent construct but were conceptually distinct (Gardner et al., 2012).

6.5.5 Predicting binge drinking behaviour

On their own the traditional variables of the TPB that were expected to predict behaviour, intentions and PBC, were able to explain 45% of variance in self-reported binge drinking behaviour. Intentions were the only one of the two which appeared as a significant predictor. This was similar to the findings in study 1 (47%). The arousal IAT was predictive of binge drinking behaviour as well. Though habit did appear as a significant predictor in step 1, when all variables were entered it was no longer significant similar to the regression findings for predicting intentions.

An interesting finding was that the implicit arousal associations had a negative relationship which suggested greater associations of alcohol with 'good' was predictive of lower frequency of binge drinking behaviour. This finding was opposite to what was expected theoretically where it was thought greater associations of alcohol with good would predict more binge drinking behaviour but from examinations of previous work (H. Gray et al., 2011; Reinout W. Wiers, Van Woerden, Smulders, & De Jong, 2002) it is not completely unusual to see this trend of those who drink alcohol having more negative associations. This type of associations has also been shown in other behaviours such as smoking (Swanson, Swanson, & Greenwald, 2001). It could be that similar to a stigmatised behaviours such as smoking, binge drinkers may consciously reconcile their performance of the behaviour with their negative knowledge of it (Halpern, 1994) and as they may confront disapproval from others or health campaigns about the negative health effects it is possible they are not able to resolve this inconsistency at the implicit level.

Overall, the model was able to explain 57% of variance in binge drinking behaviours with implicit arousal associations and intentions as significant predictors. As expected, alcohol arousal associations and having intentions to binge drink over the next week predicted self-reported binge drinking behaviour. Self-identity did approach significance ($p=.06$) when explaining behaviour suggesting that some elements of identity and associating alcohol with the self may be important. Clearly, some variance was left unexplained and other variables not examined in the scope of this project likely contribute. It also may be that the remaining variance in behaviour was due to

changing variables that are less constant and measurable such as unplanned parties or emotional events like dealing with a death in the family.

6.5.6 Conclusions

6.5.6.1 *Strengths of the study*

A strong feature of this study was that it achieved a relatively low attrition rate compared to the first study (10% vs 27%). It was required to be physically present at a computer lab on campus for time 1 and then follow up a week later by filling out an online questionnaire about subsequent binge drinking behaviour. The physical presence of the participants compared to only an online approach made a difference and this fact enhances the applied value of the study as well as providing useful theoretical insights. Other strengths include: the longitudinal nature with an experimental session and a follow-up online behavioural questionnaire one week later; complex experimental design testing identity interventions where participants were randomly allocated to groups; and further expansion of the well-established TPB to include constructs we know are important such as implicit associations, impulsivity and automaticity.

As binge drinking can often be seen as negative, there was concern about the accuracy of reported amounts of binge drinking behaviour. Another strength of this research was that steps were taken to minimize this affecting self-report measures. One way this was done was through anonymizing the data collection providing respondents a space to report their instances of binge drinking as honestly as possible. The participants were assured that data they provided would be confidential and not linked to them in any way. During time 1 of data collection in the computer labs, dividers were set up to completely separate and isolate each participant while shielding their screen and hiding their responses. Also, the online method of reporting their behaviour at time 2 allowed them to complete the questionnaire anywhere they felt appropriate with any device on which they were capable of accessing the internet (e.g. phone, tablet and laptop).

Another strength of this study was the inclusion of implicit measures regarding alcohol associations. This was done to address the question of possible bias in answering explicit questions about attitudes towards binge drinking and gain insight to true automatic associations towards the behaviour. There has been an interest in more implicit assessments of cognitive variables in alcohol research (Reinout W. Wiers et al., 2002). Alcohol arousal implicit associations interestingly predicted binge drinking behaviour over a one week period. This relationship, where those associating alcohol words with positive or 'good' words reported binge drinking more, is understandable as automatic associations could be expected to influence explicit attitudes and beliefs and it is well established that attitudes and beliefs play an important role in predicting health behaviours. This further supports the focus on attitudes as a target for alcohol interventions.

6.5.6.2 *Limitations of the study*

A few key elements of the theoretical framework have been supported with the data such as attitudes and self-identity predicting intentions. But, the present study has a number of limitations that should be noted. Not as predicted though similar to the first study, subjective norms alongside additional norms measures failed to contribute to the model. The norms measures did significantly correlate with intentions though and may have appeared to be non-significant due to measures, the methods of gathering the data or structuring of the questionnaires. It is also possible that for risky health behaviours such as binge drinking the approval of significant others, such as parents of best friends, is less important compared with other more proximal constructs like attitude and self-identity. Considering elements such as PBC have been weak or non-significant predictors in other studies (Norman & Conner, 2006) and again here suggests that other constructs are more predictive of binge drinking intentions and behaviour. As with Study 1, the mean for PBC (6.4) was high and standard deviation (0.9) was relatively low suggesting there was a lack of variation in participants' responses, likely undermining the impact of PBC in the analysis. UEA undergraduates seem to believe they have quite a lot of control over whether they are able to binge drink or not over a one week period. This weakness of the PBC and norms measures have been a driving factor for improvements and expansions to the TPB. It was for this reason that habit, impulsivity and identity constructs were tested in this study.

Further, there was no consideration of social desirability or likelihood to report what is viewed as socially acceptable (Stöber, 2001). Binge drinking can often be viewed as socially unacceptable behaviour which may lead to underreporting. The addition of a measure of social desirability could help explain and control for this phenomenon when considering the expanded TPB model. The research overall did support the TPB model and was in line with previous research suggesting that identity and habit along with components of the TPB are predictive of binge drinking behaviours in young people.

Regarding the failure of the in-group and out-group identity manipulations to differ, it could be that the students were thinking of a superordinate student identity when completing the task causing the lack of differences between groups. There is a possibility that the groups, Essex University undergraduates versus UEA undergraduates, were not different enough or that the out-group was ineffective at eliciting avoidance of intentions or the behaviour. More could be done to study which out-groups for UK undergraduates would be more suitable for an identity manipulation study such as this. A questionnaire assessing the liking and desire to be part of a list of groups could be one way of achieving this goal.

In regards to the use of both IATs, the key assignments in the tasks were not fully counterbalanced. The left key (Q) was assigned to positive and self-words and the right key (P) to negative and other words. This could have biased the results to some extent but other steps were taken to minimise issues. For example, the order of the 2 IATs were counterbalanced to minimise any carry-over effects from the other task as suggested in Lindgren et al. (2013). Another improvement on previous research (De Houwer et al., 2004) was the inclusion of a direct measure of attitudes making it possible to determine whether the indirect measures provided information that was provided by direct measures. The findings that the AI-IAT was not predictive of binge drinking outcomes was in contradiction to Lindgren et al. (2015) but the measures of behaviour were not comparable and their IATs used only words not pictures which may be why the results were not the same.

Another weakness in methodology may be the way in which the manipulations were delivered. The participants were only asked to read through and comment on the articles carrying the identity or health campaign message on the computer screen immediately before completing the IATs and TPB questionnaires. The brevity of the encounter with the manipulation may not have been sufficient to impact the other variables. Alternatively, the articles could be turned into posters or flyers that were distributed in dormitories similar to Berger and Rand (2008) or via emails to the participants before the lab experiment, even multiple times to be sure there was adequate exposure to the messages.

6.5.6.3 Future implications

To discuss future implications and directions, this work showed self-identity and explicit attitude were important predictors of intentions to binge drink over a one week period and alcohol arousal implicit associations, intentions and self-identity were important predictors of binge drinking behaviour. Therefore, future research can build on these findings and consider further variables such as wider social norms, alternative measures of alcohol identity and social desirability. Though the identity manipulation on its own did not appear to decrease binge drinking behaviour, the general message of alcohol having a negative health impact seemed to influence antecedents of binge drinking significantly suggesting health campaigns may be an area of interest when creating future interventions. These methods could have an impact in real world situations if brought in and implemented on university campuses.

The findings regarding implicit associations further indicated that drinking associations can be a reliable predictors of alcohol related behaviours (Lindgren et al., 2013). Future TPB and alcohol research may benefit from including alcohol-related arousal IATs and considering methods of changing arousal associations as an interventions target.

As self-identity was particularly predictive in this study and consistent with a recent reformulation of the TPB (Fekadu & Kraft, 2001) it could be interesting to build an experiment manipulating the strength in which an individual identifies binge drinking as part of their self-concept. This could be done in different ways, but one way that has been shown to be effective is through language and identity labels like in Walton and Banaji (2004). These types of manipulations may provide students with tools to change binge-drinking intentions and behaviours as well as offering an altered perception of the social norms. This could be an effective way of reducing the amount of risky drinking, improving the overall health and safety of the students.

7 Chapter 7: Decisions to Binge Drinking: The Effects of Language on Attitudes and Identity

7.1 Chapter Overview

Chapter 7 will outline the details of third study undertaken. This study is based on the findings from studies 1 and 2 both exploring the use of the theory of planned behaviour (Beck & Ajzen, 1991) to predict binge drinking behaviour and examining how social identity influences the decision making process. Study 1 included the basic TPB model (attitudes, subjective norms and PBC) with the added variables of habit, impulsivity, social identity and descriptive norms. Study 2 employed the same expanded TPB model with the addition of implicit measures of attitudes toward alcohol as part of an identity-based experimental model. Explicit attitudes and self-identity were predictive of intention to binge drink over a one week period in both studies while intentions appeared as a significant predictor of self-reported binge drinking behaviour at the 1-week follow-up on both occasions. Moving forward from these findings, this study will use a similar expanded TPB model but excluding the UPPS impulsivity measure and adding a measure of social desirability and drinking-identity. Also, an intervention which assesses how self-descriptive language can influence the decision making process in regards to binge drinking in young people will be tested.

The chapter will begin with an introduction about self-descriptive language and how it may influence the decision making process. Self-descriptive language is used when describing the self and could be an important consideration when looking at manipulating identity. Self-identity has appeared in the earlier studies as an important predictor of intention to binge drink. Therefore, manipulating identity with language (i.e. noun or verb labels) may have some impact on behaviour through intentions and other behavioural antecedents. One aim of this study will be to examine if noun labels strengthens the identity and increases intentions compared with verb labels. Further additions to the TPB (drinking identity and social desirability) will be discussed. As the previous findings showed self-identity was predictive of intentions to binge drink, it was thought important to find and test a specific measure of drinking identity, or measure of how much an individual considers drinking to be a part of who they are. To also address criticisms of self-report bias a measure of social desirability will be used. The introduction will conclude with the central research questions.

Following the introduction, the details of the methods will be outlined and the results of study 3 will be reviewed. 313 undergraduates (male n=83, female n=229) at UEA completed a longitudinal study (1-week follow-up). Of those, 242 completed the behaviour questionnaire at time 2. The ability of each TPB variable (explicit attitude, subjective norm and PBC) as well as additional variables (habit, social identity, descriptive norms, drinking identity and social desirability) to predict intentions and/or behaviour will be examined. Correlation analysis will be carried out to identify significant associations while a series of logistic regression analyses will be conducted to

determine which of the additional variables predict intentions and/or behaviour independently to the traditional TPB model. ANOVAs will be run to assess the impact of the self-descriptive language intervention on hypothesised variables. Finally, the chapter will conclude with a discussion of the strengths and limitation, and future implications of the research findings. Some of the major strengths of the research include a larger sample size, employing a language intervention and using robust established measures such as the TPB alongside novel additions to the model such as drinking identity and social desirability.

7.2 Introduction to Study 3: Exploring other cognitive and social factors that may influence binge drinking behaviour

The basic foundations of the previous studies in this thesis have been the Theory of Planned Behaviour (Beck & Ajzen, 1991) and the Social Identity Theory (Tajfel & Turner, 1979). The TPB states that a behaviour is predicted by an individual's intentions to perform the behaviour whereas attitudes, subjective norms, and perceived control are important predictors of intentions. SIT suggests that individuals gain a sense of who they are from their group membership. The findings so far have implied that attitudes and social identity play an important role in predicting intentions to binge drink. As discussed in section 4.3, when self-concept (a collection of beliefs about the self) is formed from group membership, this creates a basic framework of normative attitudes and behaviours for each individual to construct their self-identity (Haslam, Jetten, Postmes, & Haslam, 2009). Importantly, the actual language we use to describe ourselves and construct our identity can also influence the strength of our attitudes and how strongly we identify with particular groups and their associated behaviours (Walton & Banaji, 2004). Self-descriptive language can also give a reflective view of how we see ourselves. The decision making process is very complex and research is continuously looking to add to theories attempting to explain behaviours and considering self-descriptive language as an element of how we construct our identity and associated attitudes could lead to improvements in understanding and changing decisions to binge drink (Ajzen, 2011). Therefore, the present study will focus on whether self-descriptive language manipulation can significantly influence TPB variables and social identity variables particularly attitudes and drinking-identity. If the manipulation were to be successful in changing social-cognitive components such as attitudes, this could be an effective method on which to build interventions for behaviour change to reduce risky drinking.

The following section will begin with a discussion of self-descriptive language as a tool to manipulate attitude and identity which will include defining self-descriptive language and outlining key empirical research in the area. This will be followed by sections regarding social desirability and drinking-identity as additions to the TPB. The introduction will conclude with an outline of the central research questions.

7.2.1 Self-descriptive language as a tool to manipulate attitude and identity

7.2.1.1 What is self-descriptive language?

One way of concentrating on an aspect of cognitive and social context is through self-descriptive language or the specific language a person uses to express his or her attitudes and identity. As discussed in the previous chapter (section 6.2.3), the proposal that attitudes about oneself are subject to linguistic influence is more plausible if attitudes are viewed as temporary constructions shaped by the context in which they are elicited rather than as stable internal representations (Walton & Banaji, 2004). Walton and Banaji (2004) believe that from this perspective, the linguistic form used to describe one's attitude, influences how that attitude is constructed bottom-up. They also stated some linguistic forms suggest greater strength and stability or essentialist language, whereby inducing such a form should lead to the perception that the attitude is relatively strong. It can mean the difference in considering the behaviour as an essential part of the self or the behaviour as simply something 'I' do. This is also supported by other research (Bryan, Master, & Walton, 2014; Bryan et al., 2011; Gelman, 2004; Gelman & Heyman, 1999). Basically, using essentialist language that associates the behaviour more strongly with the identity of the individual should have a greater effect on the strength of the attitude when formed, whether negative or positive, compared to language that indicates the behaviour is an action carried out by the individual. The following section will outline key empirical research informing this study.

7.2.1.2 Key empirical examples of the use of self-descriptive language manipulations

In some of the previous research, this expression of one's attitude using language has been manipulated with a small variation of grammatical form, either with a noun (e.g. I am a chocolate-lover) label or a verb (e.g. I eat chocolate a lot) label (Gelman & Heyman, 1999; Walton & Banaji, 2004). This sections will discuss two key empirical examples of research employing the use of self-descriptive language as a tool to affect the decision making process: Gelman and Heyman (1999) and Walton and Banaji (2004). They provide important theoretical information and methodology that will be employed in this study.

7.2.1.2.1 Carrot-eaters and creature-believers: The effects of lexicalization on children's inferences about social categories.

Gelman and Heyman (1999) investigated whether the linguistic form, either a verb label such as 'She eats carrots' or a noun label such as 'She is a carrot-eater', is sufficiently powerful to produce inferences of stability of a characteristic. They tested this by using the novel normalised phrases like eating carrots to remove the possibility of contaminating effect of familiar labels that might have caused listeners to retrieve predetermined meanings, hypothesising that labels would imply greater stability of the characteristics. Participants included two groups of children, one 5 and one

7 years old, randomly assigned to one of the two label groups. The participants read a description of a character using the noun label or a verb label as follows: ‘Rose is 8 years old. Rose eats a lot of carrots. She is a carrot-eater (noun label)/She eats carrots whenever she can (verb label).’ Other items concerned a boy who thinks creatures live on other planes (a creature-believer), a boy who wakes up early (an early-waker) and a girl who really loves guinea pigs (a guinea-pig-lover). After reading the character descriptions, the participants completed four test questions concerning the stability of the key properties (e.g. eating carrots). The results showed that children judge personal characteristics as more stable when they are referred to by a noun than by a verb label. The participants in the noun condition predicted that characteristics would be more stable over time (e.g. more likely to be retained in the future) and more stable over adverse environmental conditions (e.g. more likely to be retained even when there is no family support). This result is consistent with other findings showing people possess strong stereotypes of social categories encoded in labels (Darley & Fazio, 1980) and that the nouns are particularly important when implying that a category is richly structured (D. Hall & Moore, 1997). Importantly, these findings showed the effects even with relatively novel characteristic labels implying that children were not retrieving well remembered meanings but rather made up of a general rule that applied to these novel phrases. This led them to conclude that lexicalisation in the form of a noun provided essentialist information to children regarding property stability. Though this research focused on a younger population, the implications of the research could mean using novel labels such as ‘binge-drinker’ with an undergraduate population could be effective in conveying essentialist information about characteristics regarding social identity in a similar way.

7.2.1.2.2 Being what you say: The effects of essentialist linguistic labels on preferences

Walton and Banaji (2004) examined the effects of essentialist linguistic labels on perceptions of preferences of others and of the self by carrying out three experiments. The first experiment was designed to test the idea that variation in linguistic form (noun or verb) can influence the perceived strength of others’ preferences and assessed whether the findings of Gelman and Heyman (1999) extend to adults as well. Using participants over the age of 18, they employed a similar experiment to Gelman and Heyman (1999) by manipulating the noun and verb framing. For example, participants read either, ‘Jennifer is a classical music-listener’ or ‘Jennifer listens to classical music a lot.’ They were also asked to answer questions on the strength, stability and resilience of the preferences of the fictitious individual. Findings from this first study suggested in adults, noun labels rather than verb labels used in the description of others’ attitudes lead to greater perceived strength and stability of the attitude. Experiments 2 and 3 sought to understand whether similarly minor variations in language that tap essentialist attributes could also affect assessments of the self. Experiment 2 tested whether speakers employed cues embedded in their own language to evaluate their attitudes. The undergraduate participants filled in blanks in two types of self-descriptive sentences featuring a noun label designed to portray a preference as a central aspect of

one's identity (e.g. I am a football fan) or a descriptive action verb designed to minimise the importance (e.g. I watch football a lot). The participants' evaluations of the strength, stability and resilience of their own preferences were then tested. The results for this experiment demonstrated that linguistic forms can influence an individual's own attitudes though these effects were not as large as those obtained in the first experiment on perception of others. The third experiment sought to replicate the findings of experiment 2 with changes to address the possible issue of selection effects of the choice of targets. The experimenters allowed the participants to select the targets of their preference before receiving the experimental manipulation. The study was disguised as an investigation of handwriting styles and had the participants rewrite each sentence describing each preference three times. The strength of their preferences were then measured. The results suggested a convergence with the findings of experiment 2 and additionally that the results cannot be attributed to the selection of attitude objects (targets). Overall, they found that when people described their preferences using abstract noun labels, they judged those preferences stronger and more stable than when described using descriptive action verbs. This offers a portrayal of attitudes as malleable constructs subject to variations in the form in which they are elicited which may be useful in manipulating identity involving binge drinking in young people.

7.2.1.3 A summary of employing a self-descriptive language manipulation

Previous research has demonstrated abstract linguistic forms or labels, and not just well established forms, convey relatively essentialist information; that people view characteristics described using nouns as stronger, more enduring and more central to the identity than those described using descriptive action verbs. When processing a statement about another individual, a noun label intuitively tells more about what a person is, not just about what a person is like. For example, using the verb label could be construed as temporary states ('Bob did not wash dishes today.') whereas the noun label may seem more enduring and fundamental when expressed ('Bob is a slob') (Gelman & Heyman, 1999). Initially, it was thought that this phenomenon applied to social perception and perception of others only, because the opportunity to directly access a rich network of internalised self-knowledge would make variation in linguistic form irrelevant to assessments of one's own preferences (Walton & Banaji, 2004). But, crucially, Walton and Banaji (2004) have established attitudes regarding the self are constructed in part on a momentary basis from contextual cues rather than merely deriving from stable internal representations, as with social perception. And, if one's own self-view is subject to subtle linguistic influence, it supports the idea that familiar well-worn attitudes and preferences vary with contextually provided input.

Therefore, if attitudes can be viewed as temporary constructs shaped by the context in which they are elicited, as previously discussed in Chapter 6 and further supported in this chapter, then a proposal that attitudes are subject to linguistic influence should be possible (Smith, 1996). This alternative view regarding attitudes could also have important implications for how attitude as a

construct plays a role in the TPB which will be discussed in Chapter 8. Based on these findings that people perceive essentialism in the grammatical form of noun labels, this study will use essential linguistic labels in an attempt to manipulate the strength of attitude and identity associated with binge drinking in young people by making parts of the participants' identity salient during testing. If attitudes can be influenced, and attitudes have been shown to be the best predictors of intentions to binge drink in the previous studies and in turn intentions predict behaviour, it can be hypothesised that behaviours could be influenced through this pathway by using a linguistic label to make binge drinking identity salient. The next section will discuss drinking-identity as an addition to the TPB model.

7.2.2 Drinking-identity: a tailored measure of self-identity

The TPB has been open to additions for explaining additional variance in behaviour as previously discussed, and a focus in this study was how social identity plays a role in the decision making process to binge drink. Foster, Yeung, and Neighbors (2014) proposed that predictive validity of intent and behaviour improve with the addition of self-identity which has been described as the salient part of the self that is related to a behaviour. This claim has been supported in the previous studies of this thesis and by other researchers (Conner & Armitage, 1998; Gardner et al., 2012) showing people are driven to maintain consistent self-views and engage in identity-compatible behaviour as a means of maintenance. A self-identity measure regarding drinking alcohol consisting of two questions has been used in study 1 and 2, but using a tailored measure of identity in regards to alcohol specifically is important making the self-reported drinking-identity (SRDI) by Foster et al. (2014) especially relevant concerning the present research. In their research using the SRDI, Foster et al. (2014) found the measure was positively associated with alcohol consumption which would be consistent with recent reformulations of the TPB model (Fekadu & Kraft, 2001) that demonstrate including measures of identification with a behaviour will increase the predictability of that behaviour. For these reasons, the SRDI will be used as the measure of self-identity for this study. The following section will discuss social desirability as an additional measure for predicting decision to binge drink alongside the traditional TPB variables.

7.2.3 Social desirability predicting intentions to binge drink

7.2.3.1 What is social desirability?

As discussed in Chapter 2, binge drinking has often been associated with adverse health outcomes and can potentially reflect poorly on a person's character. These negative associations surrounding alcohol and binge drinking could possibly lead to underreporting of drinking behaviours in self-report research. Though the previous 2 studies have shown positive explicit attitudes toward binge drinking, it is worth considering, when asked about binge drinking behaviours if an individual is likely to report the truth or alternatively report what they might think is more socially acceptable. This concept, termed social desirability, is defined as the desire to present oneself in a positive

light and is sometimes associated with over-reporting of positive characteristics such as helpfulness and height, and under-reporting of negative characteristics such as weight or alcohol consumption (Fleming & Zizzo, 2011; Larson, 2000). If participants are likely to misrepresent themselves, it would be wise to take into account a social desirability distortion. There are two components of social desirability: impression management and self-deception. Impression management reflects a tendency to self-attribute saintly or virtuous characteristics and deny socially deviant impulses or behaviours, for example 'I always pick up my litter on the street' (Davis, Thake, & Vilhena, 2010). Self-deception reflects a tendency to unconsciously exaggerate desirable qualities, for example 'My first impressions always turn out to be right' (Paulhus, 2002). Regarding alcohol and those caring about the impressions they make on others, it would be expected they sometimes underreport the extent to which they consume alcohol or experience the harms from use. 'Impression-managers' would avoid appearing to have problematic drinking behaviours as it would be seen as stigmatising and unattractive and there is no reason to believe self-deception would lead to understating consumption (Davis et al., 2010). Though if one does engage in self-deception it could be motivated unconsciously by a desire to deny the experience of harmful consequences as drinking outcomes may be difficult to integrate into the positive self-view leading to decreased self-report even when anonymity is guaranteed in the research (Davis et al., 2010; Fleming & Zizzo, 2011). Considering social desirability may impact the decision making process, and it could be useful to incorporate this construct in an expanded TPB model.

7.2.3.2 Social desirability as an addition to the TPB

Research suggests social desirability shows conformity to social norms and that socially desirable responding (SDR) has a role in behavioural choices (Crowne & Marlowe, 1960) but it has also been implicated in risk perceptions for socially unacceptable hazards like drinking alcohol (Fleming, Townsend, Lowe, & Ferguson, 2007). Considering social desirability in the prediction of intentions and behaviour could be useful in explaining some variance in decisions to binge drink while also assessing the impact it has on questionnaire responses (Armitage & Conner, 1999). Using a measure by Stöber (2001), Social Desirability-17, with a Likert scale 1-7 allows this construct to be placed in the model to assess its contribution to the TPB (as all the other variables in the model are assessed with this same Likert type scale). Because most of the research regarding the social desirability scales have used dichotomous groups (Paulhus, 1991; Stöber, 2001), this method will be examined in the analysis to compare high-scorers and low-scorers on all variables (Armitage & Conner, 1999) but not used as an exclusionary tool to rule out high scorers from the study. We could expect those with high SDR scores and higher norms measures regarding binge drinking to also have higher behavioural scores. Next, the central research questions of this study will be outlined.

7.2.4 Central research questions

In summary, attitudes can be considered situationally dependent and less stable temporary constructs shaped by the context in which they are elicited. Evidence has shown that they can be susceptible to linguistic influence making them a target for interventions. The overall aim is to evaluate the extent to which a language identity association intervention impacts an expanded TPB explaining binge drinking intentions and behaviour while assessing how the addition of social desirability and drinking-identity can improve the ability to predict intentions and behaviour.

7.2.4.1 Hypotheses

1. The noun-label self-descriptive language will produce more positive explicit attitudes toward binge drinking and stronger drinking identity scores for those having reported binge drinking in the previous 30 days compared to the verb-label self-descriptive language.
2. The noun-label self-descriptive language will produce less positive explicit attitudes toward binge drinking and weaker drinking identity scores for those having reported NOT binge drinking in the previous 30 days compared to the verb-label self-descriptive language.
3. The basic TPB variables (attitude, subjective norms and PBC) with the additional variables (drinking-identity, social desirability, habit, social identity and descriptive norms) will predict intentions to binge drink in the next week, measured at time 1.
 - a. Positive attitudes will be independently predictive of greater intentions to binge drink in the next week.
 - b. Increased subjective norms will be independently predictive of greater intentions to binge drink in the next week.
 - c. Greater PBC will independently predict greater intentions to binge drink in the next week.
 - d. Decreased social desirability reporting will independently predict greater intentions to binge drink in the next week.
 - e. Stronger drinking-identity will independently predict greater intentions to binge drink in the next week.
 - f. Higher habit scores will be independently predictive of greater intentions to binge drink in the next week.
 - g. Greater UEA identity will be independently predictive of greater intentions to binge drink in the next week.
 - h. Higher group norms scores will be independently predictive of greater intentions to binge drink in the next week.
 - i. Descriptive norms will independently predict intentions to binge drink in the next week.

4. TPB measures (intentions and PBC) with the additional variable of habit will predict self-reported binge drinking behaviour measured at time 2.
 - a. Greater intentions to binge drink in the next week will independently predict increased self-reported binge drinking behaviour measured at time 2.
 - b. Greater PBC will independently predict increased self-reported binge drinking behaviour measured at time 2.
 - c. Higher habit scores will independently predict increased self-reported binge drinking behaviour measured at time 2.

7.3 Method

7.3.1 Participants

An opportunistic sample of 313 undergraduate students from the University of East Anglia took part in the time 1 online questionnaire and 242 completed the time 2 behaviour questionnaire (one week after time 1), a 77% retention rate. The undergraduate students were recruited through social media, emails and SONA. They were at least 18 years of age ranging from 18 – 44 with a mean age of 19.93 and median of 19. This included both male (n=83) and female (n=229) participants.

7.3.2 Design

Data was gathered in a longitudinal study with time 1 and time 2 being 1 week apart and analysed using PASW (SPSS) 18. The data was gathered during the autumn term of 2014 (from October to December). The dependent variables were intentions to binge drink, attitudes, subjective norms, PBC, habit, drinking-identity, social desirability, UEA identity, group norms and descriptive norms. The independent variables were the language groups: noun, verb and control. Participants were split into those binge drinking in the last 30 days (n=216) and those who had not (n=97) according to their self-report response and then randomly assigned to either the verb, noun or control groups for the manipulation.

7.3.3 Materials

At time 1, an online questionnaire assessing components of the theory of planned behaviour (behavioural intentions, attitudes, subjective norms and perceived behavioural control), descriptive norms, habit, UEA identity, group norms, self-reported drinking-identity and social desirability in relation to drinking alcohol as well as demographics (age, gender, year of study, school of study, English as a first language) was made available on Qualtrics. Time 2 consisted of an online self-report binge drinking behavioural questionnaire. Examples of the materials can be found in the Appendices. The following sections detail the measures used in both the time 1 and time 2 questionnaires.

7.3.3.1 Language Manipulation

Each participant was asked if they had participated in a binge drinking session in the previous 30 days. Those selecting yes, were randomly assigned to the corresponding noun ‘As a binge-drinker...’, descriptive verb ‘As someone who binge drinks...’ or control groups. Those selecting no, were randomly assigned to the corresponding noun ‘As a non-binge-drinker...’, descriptive verb ‘As someone who does not binge drinks...’ or control groups. Each corresponding noun and descriptive verb label appeared at the top of each page of the questionnaire. The questions were adapted from Walton and Banaji (2004) experiments to include alcohol related information.

7.3.3.2 Behaviour

At time two, one week after the first questionnaire and similar to the previous studies, the participants completed measures about their drinking behaviour during the prior week such as, “I participated in a binge drinking session in the last week definitely no (1-7) definitely yes.” A combination of five, 7-point Likert-type questions and two numerical-answer questions were used in this portion of the measure. The numerical-answer questions asked how many times the participant drank under the binge drinking limit and how many times they drank more than the limit. A comment section was made available on both time 1 and time 2 questionnaires for the participants to ask questions, express concerns or to simply make statements. Again, as in study one and two, the two items regarding whether the participant drank alcohol in the last week but less than the binge drinking limit (I drank alcohol in the last week but not more than 4/5 alcoholic drinks in a single session: definitely no/definitely yes; and In the last week, I stopped drinking before I was drunk: definitely no/definitely yes) were excluded from the scale during analysis as removing them improved the reliability of the self-report binge drinking behaviour measure. The Cronbach’s alpha for the behaviour scale was .83 and a higher behaviour score indicated greater occurrence of binge drinking in the previous week.

7.3.3.3 Intentions

As with the previous studies, intentions were measured using items derived from Cooke et al. (2007) for example, ‘I intend to participate in at least one binge drinking session in the next week (strongly agree - strongly disagree)’. Similar to the first studies, the item ‘I plan to drink less than 4/5 alcoholic drinks in a single session in the next week (definitely agree - definitely disagree)’ was excluded from the scale as the inter-item correlations were low and the alpha was improved by its removal. The Cronbach’s alpha for the intentions scale with the eight remaining items was .97 and higher scores were indicative of greater intentions to binge drink in the next week.

7.3.3.4 Attitude

Explicit attitudes towards binge drinking were measured in the same way as in study 1 and 2 with five 7-point semantic differential scales. The students were asked to indicate how they felt about

drinking alcohol on the following bipolar dimensions: bad to good, unpleasant to pleasant, enjoyable to unenjoyable, foolish to wise and harmful to beneficial. The Cronbach's alpha for this scale was .89 and higher scores were indicative of more positive attitudes towards binge drinking.

7.3.3.5 Subjective Norms

Subjective norms were measured using two items based on the findings of study 1 and 2 by asking the students to indicate to what extent people who were important to them and whose opinion they valued approved of their drinking alcohol on a 7-point scale. The Cronbach's alpha for the scale was .78 and higher scores were indicative of greater normative support or perceived approval of binge drinking from important others.

7.3.3.6 Perceived Behavioural Control

Perceived behavioural control was assessed by four items addressing the students' perceived ability to control whether they consumed alcohol as in Williams and Hine (2002). 'Whether I do or do not binge drink is entirely up to me'; 'How much control do you feel you have over binge drinking in the next week?'; 'If I wanted to, I could easily binge drink in the next week'; and 'I have complete control over whether I binge drink in the next week.' The third item was excluded from the scale as the alpha was significantly improved by its removal. The Cronbach's alpha for PBC was .90 and higher scores were indicative of greater perceived control over binge drinking in the next week.

7.3.3.7 Descriptive Norms

Descriptive norms were measured in the same way as the first two studies with 2 items adapted from Ravis and Sheeran (2003) using a 7-point Likert scale. The 2 items were: 'How often does your best friend have at least one drink of alcohol in a week?' and 'How often does your best friend binge drink in a week?' The Cronbach's alpha for descriptive norms was .79 and higher scores indicated greater perceptions of binge drinking as a peer normative behaviour.

7.3.3.8 Habit

Habit was measured using the Self-Report Habit Index as in studies 1 and 2. Twelve questions relating to three characteristics of habitual action where the participants rated their (dis)agreement: automaticity (e.g. [Drinking is something...] I have no need to think about doing), frequency (e.g. ...I do frequently), and relevance to self-identity (e.g. ...that's typically me). The Cronbach's alpha for the habit measure was .93 and higher habit scores indicated greater binge drinking habit strength.

7.3.3.9 Social identity

The social identity constructs were measured in the same way as the first and second studies through UEA identification, group norms with the addition of a specific drinking-identity measure. These constructs are discussed in greater detail in the following sections.

7.3.3.9.1 UEA identification and group norms

UEA identification (12 items) and group norms (11 items) were assessed using measures adapted from K. Johnston and White (2003) such as: ‘How much do you feel you identify with other UEA students?’; ‘With respect to your general attitudes and beliefs, how similar do you feel you are to other UEA students?’; ‘Is drinking alcohol something university students do often?’; and ‘In general, how well do you feel you fit in with other UEA students.’ All items were measured on a 7-point scale ranging from 1-7 with labels at either end. The Cronbach’s alpha for UEA identity was .92 and higher UEA identity scores indicated stronger identification as a UEA undergraduate. The Cronbach’s alpha for group norms was .88 and higher group norms scores indicated greater perceptions that binge drinking was part of being a typical university student

7.3.3.9.2 Drinking-Identity

A series of 5 questions made up the drinking-identity measure: ‘Drinking alcohol is an important part of who I am’; ‘I would feel a loss if I were forced to give up drinking alcohol’; ‘Drinking alcohol is something I rarely even think about’; ‘For me, alcohol consumption means more than just having a drink’; and ‘Drinking alcohol is a normal part of everyday life.’ This measure was used to measure the degree to which the participants considered drinking alcohol as part of their identity. This was the self-reported drinking identity (SRDI) scale used in Foster et al. (2014). The Cronbach’s alpha for the drinking-identity measure was .70 and higher drinking identity scores indicated stronger identification as someone who drinks alcohol.

7.3.3.10 Social Desirability

Social desirability was measured using Stöber (2001) Social Desirability-17 measure which included 16 questions such as ‘I sometimes litter’ and ‘I occasionally speak badly of others behind their back.’ These were assessed using a Likert type scale from 1 – 7 ranging from true to false. The Cronbach’s alpha for social desirability was .75 and higher scores indicated greater desire to respond in a way that was viewed more favourably by others.

7.3.4 Procedure

After following the link provided on the flyer, poster or website, the participants were taken to Qualtrics.com with an information screen explaining instructions, providing information about the researcher, study and their participant rights. They chose ‘continue’ at the bottom of the page to

take part or closed the window to exit. Further procedures for study 3 were virtually the same as found in study 1 (section 5.3.4). Those choosing to participate were able to complete the time 1 questionnaire from October 2014 to any time before 31st March 2015. Only those providing contact details at time 1 were provided the link for the time-2 questionnaire in an email reminder. Using the emails provided during the time-2 questionnaire, 15 randomly selected participants were drawn to win 20 pounds of Amazon vouchers. A participant was only eligible for the prize draw if they had completed both time 1 and time 2 questionnaires. This rule was clearly stated to the participants before they took part in any of the research. The draw took place on 31 March 2015. The winner was contacted and arrangements were made to collect their prize. After collection, all contact details for all participants were deleted. Electronic data was password protected and was stored on a memory stick in a locked filing cabinet in a restricted access room in Elizabeth Fry Building.

7.4 Results

7.4.1 Overview of results

This section will discuss the results in relation to a language based identity manipulation and an expanded TPB (including drinking-identity and social desirability) predicting binge drinking behaviour. Preliminary analysis will be completed to account for missing and outlying data before conducting correlations and regression analysis and the results are reported in order of hypotheses listed. The results section will begin with descriptive and correlational data of each measure used. Table 7.1 shows the descriptive data and Table 7.2 shows all correlational data for behaviour, intentions, attitude, subjective norms, PBC, descriptive norms, habit, UEA identity, group norms, drinking-identity and social desirability. Then, those reporting participation in a binge drinking session in the last 30 days will be compared with those reporting no participation in a binge drinking session in the last 30 days. Results of these t-tests will be shown in Table 7.3. ANOVA analysis and comparisons of the experimental groups (data shown in Tables 7.4 and 7.5) are followed by regression analysis pertaining to the predictive utility of the expanded TPB. Multiple hierarchical forced entry linear regressions of the TPB measures, descriptive norms, habit, UEA identity, group norms, drinking-identity and social desirability onto intentions; and intentions, PBC and habit onto binge drinking behaviour over a one week period are presented in Table 7.7 and Table 7.8 respectively.

7.4.2 Preliminary analysis

As with the first studies, the goal for sample size was to have a minimum of 80 participants but as it was an online questionnaire sampling goals were set higher. The target for recruitment in the third study was to aim for 300 participants at time 1 to increase the numbers of participants in each condition compared to the numbers recruited in study 2. Tests for normal distribution were run using skewness and kurtosis values. Assessments of visual aids such as graphs and data were

checked for outliers. At time 1, the sample included 313 participants with an attrition rate of 23% (more similar to study 1) retaining 242 participants for time 2 and meeting the minimum desired participants overall.

Convergent validity of measures were examined using inter-correlation of items measuring the same variable (see table 7.1 for Cronbach's alpha of each variable). With a functionally sufficient test of discriminant validity set at correlations not exceeding $r=.85$ as used in the previous studies, all of the variables met the requirements (see Table 7.2 for correlations of variables). Findings for distribution of each variables were similar to the other studies and the data here was treated in the same way where regression analysis was conducted with the original untransformed data. To determine if there were significant differences between those participants completing both time 1 and time 2 questionnaires and those only taking part in time 1, independent samples t-tests were run to identify any significant mean differences between the two groups. The results showed that no variables had significant differences in means.

7.4.3 Descriptive data

Table 7.1 - Means, standard deviation and Cronbach's Alphas for all variables. All scales ranged from 1-7.

	Alphas	Mean	SD
Behaviour	.83	1.9	1.3
Intentions	.97	3.4	2.1
Attitude	.89	3.4	1.4
Subjective Norms	.78	3.2	1.4
PBC	.90	6.2	1.1
Descriptive Norms	.79	4.7	1.7
Habit	.93	2.6	1.4
UEA Identity	.92	5.1	1.1
Group Norms	.88	4.7	0.9
Drinking Identity	.70	3.2	1.2
Social Desirability	.75	4.7	0.8

Descriptive data for all variables are shown in Table 7.1. Overall, participants reported neutral explicit attitudes towards binge drinking ($M=3.4$, $SD=1.4$) and subjective norms were similar

(M=3.2, SD=1.4). They reported having quite high perceptions of control over binge drinking (M=6.2, SD=1.1) and participants had moderate intentions to binge drink in the next week (M=3.4, SD=2.1). Young people reported stronger descriptive norms (above the scale midpoint) regarding binge drinking (M=4.7, SD=1.7) and habit scores were low (M=2.6, SD=1.4). Drinking-identity scores were close to the scale midpoint (M=3.2, SD=1.2). Group norms (M=4.7, SD=0.9) and UEA identity (M=5.1, SD=1.1) were high. Cronbach's Alphas for all scales were at or above .70.

7.4.4 Correlations of variables

Table 7.2 features the bivariate correlations among the variables of interest (intentions, attitude, PBC, subjective norms, descriptive norms, habit, UEA identity, group norms, drinking identity and social desirability). Attitude ($r = .68, p < .01$), subjective norms ($r = .54, p < .01$) and PBC ($r = -.16, p < .01$) all correlated with intentions to binge drink as the theory postulates. All additions to the model were significantly correlated with intentions as well ($p < .05$). Intentions, subjective norms, attitude, habit, UEA identity and drinking identity were significantly positively correlated with binge drinking behaviour and PBC and social desirability were significantly negatively correlated with binge drinking behaviour ($p < .05$).

Table 7.2 - *Bivariate correlations for TPB components (intentions, attitudes, perceived behavioural control and subjective norms), descriptive norms, habit, UEA identity and group norms, drinking-identity, social desirability and behaviour for all participants in Study 3 (n=313).*

	ATT	PBC	SN	DN	HAB	UEAID	GN	DI	SD	BEH
Intentions	0.68**	-0.16**	0.54**	0.47**	0.61**	0.27**	0.16**	0.53**	-0.26**	0.64**
Attitude		-0.05	0.56**	0.28**	0.39**	0.28**	0.11	0.35**	-0.13*	0.43**
PBC			-0.14*	-0.12*	-0.39**	0.06	-0.09	-0.28**	-0.25**	-0.14*
Subjective Norms				0.35**	0.39**	0.21**	0.21**	0.32**	-0.16**	0.38**
Descriptive Norms					0.43**	0.37**	0.17**	0.32**	-0.15*	0.38**
Habit						0.25**	0.13*	0.62**	-0.29**	0.54**
UEA Identity							0.15**	0.16**	0.05	0.24**
Group Norms								0.07	-0.14*	0.07
Drinking Identity									-0.22**	0.46**
Social Desirability										-0.14*

** . Correlation significant at the 0.01 level (2-tailed)

* . Correlation significant at the 0.05 level (2-tailed)

7.4.5 Comparing drinkers and non-drinkers

Independent-samples T tests were run to compare participants reporting binge drinking in the last 30 days ($n = 216$) and those who did not ($n = 97$) across all TPB variables, descriptive norms, habit, UEA identity, group norms, drinking-identity, social desirability and behaviour. Group statistics, including sample sizes, means and standard deviations along with results of the t -tests, are shown in Table 7.3.

Table 7.3 - Sample sizes (N), means, standard deviation, t scores, df and p values for all variables in Study 3 by binge drinking group – In the last 30 days have you had five or more alcoholic drinks on a single occasion? Yes/No

	Group	N	Mean	SD	t	df	p																																																																																																																				
Behaviour	Y	165	3.3	1.6	12.03	240	<.00																																																																																																																				
	N	77	0.9	0.6				Intentions	Y	214	4.1	2.0	12.07	265.41	<.00	N	95	1.8	1.3	Attitude	Y	214	3.8	1.2	8.53	160.64	<.00	N	96	2.4	1.4	Subjective Norms	Y	216	3.5	1.4	6.37	311	<.00	N	97	2.5	1.2	PBC	Y	215	6.1	1.1	-1.92	309	.055	N	96	6.4	1.1	Descriptive Norms	Y	216	5.1	1.6	6.45	166.21	<.00	N	96	3.8	1.7	Habit	Y	210	3.0	1.4	10.62	271.09	<.00	N	92	1.6	0.8	UEA Identity	Y	212	5.4	1.0	5.56	306	<.00	N	96	4.7	1.1	Group Norms	Y	213	4.7	0.9	1.06	150.77	.291	N	95	4.6	1.1	Drinking Identity	Y	216	3.5	1.2	7.09	311	<.00	N	97	2.5	1.1	Social Desirability	Y	203	4.59	0.7	-1.93	294	.055
Intentions	Y	214	4.1	2.0	12.07	265.41	<.00																																																																																																																				
	N	95	1.8	1.3				Attitude	Y	214	3.8	1.2	8.53	160.64	<.00	N	96	2.4	1.4	Subjective Norms	Y	216	3.5	1.4	6.37	311	<.00	N	97	2.5	1.2	PBC	Y	215	6.1	1.1	-1.92	309	.055	N	96	6.4	1.1	Descriptive Norms	Y	216	5.1	1.6	6.45	166.21	<.00	N	96	3.8	1.7	Habit	Y	210	3.0	1.4	10.62	271.09	<.00	N	92	1.6	0.8	UEA Identity	Y	212	5.4	1.0	5.56	306	<.00	N	96	4.7	1.1	Group Norms	Y	213	4.7	0.9	1.06	150.77	.291	N	95	4.6	1.1	Drinking Identity	Y	216	3.5	1.2	7.09	311	<.00	N	97	2.5	1.1	Social Desirability	Y	203	4.59	0.7	-1.93	294	.055	N	93	4.77	0.8								
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Levene's test for equality of variances was significant for behaviour, intentions, attitude, descriptive norms, habit, group norms and behaviour ($p < .05$) meaning for these variables equal variances could not be assumed. There were significant differences between the yes and no groups regarding behaviour, intentions, attitudes, subjective norms, descriptive norms, habit, UEA identity and drinking identity. Notably, the group means did not significantly differ for PBC, group norms and social desirability.

7.4.6 Language identity manipulations – hypothesis 1 and 2

Analysis regarding the effect of the language identity manipulation will be discussed with analysis run on data for all participants (Table 7.4) first, followed by those having reported 'yes' to the question of whether they had participated in binge drinking in the last 30 days (Table 7.5) and then for those that reported 'no' to a binge drinking sessions in the previous 30 days (Table 7.6).

7.4.6.1 2x3 ANOVA for binge drinking and language groups

In comparing variables by language manipulation group (noun, verb and control groups) for all participants binge drinking in the last 30 days and not ($n=309$), a 2x3 ANOVA was carried out with the dependent variable of intentions to binge drink in the next week. Results for the analysis can be found in Table 7.4 below. Between subjects effects showed differences between 'binge drinkers' and 'non-binge drinkers' but not for any of the language manipulation groups and there was no interaction.

Table 7.4 – Results of a 2 (binge drinking: In last 30 days, not in last 30 days) x 3 (Language groups: noun, verb, control) ANOVA with a dependent variable of intentions to binge drinking in the next week; includes Source, degrees of freedom, mean square, F and significance.

Source	df	Mean Square	F	Sig.
Corrected Model	5	70.927	22.141	.000
Intercept	1	2236.162	698.055	.000
BDYN	1	344.901	107.666	.000
Group	2	2.374	.741	.477
BDYN * Group	2	5.721	1.786	.169
Error	303	3.203		
Total	309			
Corrected Total	308			

7.4.6.2 Analysis for 'binge drinkers'

In comparing variables by language manipulation group (noun, verb and control groups) for only those in the binge drinking in the last 30 days group ($n=214$), ANOVAs were carried out for intentions, attitude, subjective norms, PBC, descriptive norms, habit, UEA identity, group norms,

drinking-identity and social desirability. Results for the analysis can be found in Table 7.5. Effects of group were found for subjective norms and PBC. Levene's test were significant for PBC ($p < .05$) meaning the assumption that the variances of the groups were not significantly different were not met therefore the Welch's F are reported for PBC. For all other variables the assumptions that the variances of the groups were not significantly different were met. The ANOVA showed a significant effect of language manipulation on PBC [Welch's $F(2, 136.58) = 3.4, p < .05$] and subjective norms [$F(2, 213) = 3.5, p < .05$]. We can conclude that at least one of the three manipulation groups differed significantly on their average scores for PBC and subjective norms. For PBC, approximately 19% ($r = .19$) of the total variance was accounted for by the identity manipulation showing a small effect size. For subjective norms, approximately 18% ($r = .18$) of the total variance was accounted for by the identity manipulation showing a small effect size. Post hoc analysis were run to identify which groups had significant differences. These are reported in the following sections.

7.4.6.2.1 *Subjective norms comparisons*

Tukey HSD post hoc procedure was used as the homogeneity of variance assumption were met for the subjective norms variable. Using an a priori alpha level of .05 for the comparisons, the noun (As a binge drinker) vs. the verb (As someone who binge drinks) group (mean difference = 0.13) was not significant, $p(.842) > .05$. The noun vs. the control group (mean difference = 0.56) was significant, $p < .05$. The verb vs. the control group (mean difference = 0.44) was not significant, $p(.122) > .05$. For subjective norms, the noun association group were significantly different to the control with higher subjective norms scores compared to the control. The noun and verb groups were not significantly different from each other.

7.4.6.2.2 *PBC comparisons*

Games-Howell post hoc procedure was used as the homogeneity of variance assumption were not met for the PBC variable. Using an a priori alpha level of .05 for the comparisons, the noun vs. the verb group (mean difference = -0.41) was not significant, $p(.086) > .05$. The noun vs. the control group (mean difference = -0.47) was significant, $p < .05$. The verb vs. the control group (mean difference = -0.05) was not significant, $p(.933) > .05$. For PBC, the noun association groups were significantly different to the control with lower PBC scores than the control group. The noun and verbs groups were not significantly different from each other; and the verb group was not significantly different from the control group. No other variables showed effects of group for those having binge drank in the last 30 days.

Table 7.5 - Results of ANOVAs for 'binge drinkers' including *df*, *F*, *p* values, *N*, means, standard deviation for all variables by experimental group (noun, verb and control). Scales ranged 1-7.

Variable	<i>df</i>	<i>F</i>	<i>p</i>	Group	<i>N</i>	Mean	SD
Behaviour	162	0.2	.819	Noun	55	2.3	1.3
				Verb	56	2.3	1.3
				Control	54	2.4	1.2
Intentions	211	0.5	.639	Noun	70	4.2	2.1
				Verb	71	4.1	2.1
				Control	73	3.9	1.8
Attitude	211	0.4	.689	Noun	70	3.9	1.2
				Verb	72	3.7	1.2
				Control	72	3.8	1.2
Subjective Norms	213	3.5	.032*	Noun	70	3.7	1.4
				Verb	73	3.6	1.4
				Control	73	3.2	1.2
PBC	212	4.1	.017*	Noun	69	5.8	1.3
				Verb	73	6.2	1.0
				Control	73	6.3	0.9
Descriptive Norms	213	1.5	.232	Noun	70	5.0	1.7
				Verb	73	5.4	1.3
				Control	73	5.0	1.6
Habit	207	0.7	.507	Noun	67	3.1	1.3
				Verb	71	3.1	1.5
				Control	72	2.9	1.4
UEA Identity	209	1.3	.280	Noun	69	5.2	1.0
				Verb	71	5.4	1.0
				Control	72	5.5	1.0
Group Norms	210	0.5	.613	Noun	68	4.6	0.8
				Verb	73	4.7	1.0
				Control	72	4.8	0.8
Drinking Identity	213	0.3	.708	Noun	70	3.4	1.1
				Verb	73	3.6	1.2
				Control	73	3.4	1.2
Social Desirability	200	0.0	.960	Noun	68	4.6	0.7
				Verb	69	4.6	0.8
				Control	66	4.6	0.7

7.4.6.3 Analysis for 'non-binge drinkers'

In comparing variables by language manipulation group (noun, verb and control groups) for only those reporting they did not binge drinking in the last 30 days group ($n = 97$), ANOVAs were carried out for intentions, attitude, subjective norms, PBC, descriptive norms, habit, UEA identity, group norms, drinking-identity and social desirability. Results for the analysis can be found in Table 7.6. Effects of group were found for intentions. Levene's test were significant for intentions ($p < .05$) meaning the assumption that the variances of the groups were not significantly different were not met therefore the Welch's F are reported for intentions. For all other variables the assumptions that the variances of the groups were not significantly different were met. The ANOVA showed a significant effect of language manipulation on intentions only [Welch's F (2, 55.709) = 3.5, $p < .05$]. We can conclude that at least one of the three manipulation groups differed significantly on their average scores for intentions. Approximately 26% ($r = .26$) of the total variance was accounted for by the identity manipulation showing a small effect size. Post hoc analysis were run to identify which groups had significant differences.

7.4.6.3.1 Intentions comparisons

Games-Howell post hoc procedure was used as the homogeneity of variance assumption were not met for the intentions variable. Using an a priori alpha level of .05 for the comparisons, the noun vs. the verb group (mean difference = 0.35) was not significant, $p = .530$. The noun vs. the control group (mean difference = 0.44) was not significant, $p = .342$. The verb vs. the control group (mean difference = 0.79) was significant, $p < .05$. The noun association group was not significantly different to the control or the verb group. The verbs group was significantly different from the control with significantly lower intention scores than the control. No other variables showed effects of group for those not binge drinking in the last 30 days

7.4.7 Predicting binge drinking intentions – hypotheses 3

Forced hierarchical multiple linear regression analysis was used to predict intention to engage in a binge drinking session over a week for all participants (Table 7.7). The variables were entered into three blocks: the traditional TPB variables first (1) attitude, subjective norms and PBC; followed by the novel variables (2) social desirability and drinking-identity; and finally the previously used additional variables (3) habit, descriptive norms, UEA identity and group norms. This was done to assess the individual contributions of the traditional TPB first, then the new constructs followed by those previously used. With a Durbin-Watson score of 2.04, the assumption that errors in the regression were independent were met and no collinearity was found within the data. Casewise diagnostics were run and no problems were found meaning this model was reliable and had not been influenced by any subset of cases.

Table 7.6 - Results of ANOVAs for 'non-binge drinkers' in the last 30 days including *df*, *F*, *p* values, *N*, means, standard deviation for all variables by experimental group (noun, verb and control). All scales ranged from 1-7.

Variable	<i>df</i>	<i>F</i>	<i>p</i>	Group	<i>N</i>	Mean	SD
Behaviour	74	0.9	.399	Noun	24	1.0	0.8
				Verb	30	0.8	0.4
				Control	23	0.9	0.6
Intentions	92	3.2	.044*	Noun	30	1.7	2.1
				Verb	31	1.4	2.1
				Control	34	2.2	1.8
Attitude	93	0.5	.603	Noun	30	2.3	1.3
				Verb	32	2.4	1.4
				Control	34	2.6	1.4
Subjective Norms	94	0.6	.566	Noun	30	2.4	1.2
				Verb	32	2.3	1.3
				Control	35	2.6	1.2
PBC	93	0.1	.926	Noun	30	6.3	1.3
				Verb	31	6.4	1.2
				Control	35	6.4	0.8
Descriptive Norms	93	0.4	.684	Noun	30	3.6	1.7
				Verb	31	4.0	1.7
				Control	35	3.8	1.8
Habit	89	0.3	.774	Noun	30	1.7	0.9
				Verb	29	1.6	0.8
				Control	33	1.6	0.9
UEA Identity	93	2.4	.101	Noun	30	4.7	1.1
				Verb	31	5.0	1.0
				Control	35	4.4	1.2
Group Norms	92	0.2	.787	Noun	30	4.6	1.2
				Verb	31	4.5	1.2
				Control	34	4.7	0.8
Drinking Identity	94	1.7	.195	Noun	30	2.5	0.9
				Verb	32	2.2	1.0
				Control	35	2.7	1.2
Social Desirability	90	2.3	.110	Noun	30	4.9	0.7
				Verb	28	4.9	0.8
				Control	35	4.6	0.8

The TPB variables were able to explain 49% of the variance in binge drinking intentions (adjusted $R^2 = .49$, $F(3, 271) = 87.05$, $p < .001$). Attitude, subjective norms and PBC had significant beta weights as shown in Table 7.7. The addition of social desirability and drinking-identity at step two produced a significant increase of 9% in the amount of variance explained (adjusted $R^2 = .57$, R^2 change = $.09$, $F(5, 269) = 73.78$, $p < .001$) in binge drinking intentions to 58%. Attitude, subjective norms, social desirability and drinking-identity had significant beta weights. The addition of the habit, descriptive norms, UEA identity and group norms at step three produced a significant increase in the amount of variance explained by 7% (adjusted $R^2 = .63$, $F(9, 265) = 53.84$, $p < .001$). Attitude, subjective norms, social desirability, drinking-identity, habit and descriptive norms had significant beta weights. Overall, the full expanded TPB model was able to explain 65% of the variance in binge drinking intention.

Table 7.7 - Predicting binge-drinking intentions using TPB variables, drinking identity, social desirability, habit, descriptive norms, UEA identity and group norms ($N=313$).

	Variable	Step 1	Step 2	Step 3
1	Attitude	0.56***	0.47***	0.42***
	SN	0.20***	0.16**	0.10*
	PBC	-0.10*	0.06	0.06
2	Social Desirability		-0.12**	-0.09*
	Drinking Identity		0.29***	0.14**
3	Habit			0.25***
	DN			0.17***
	UEA ID			-0.002
	GN			0.01
	R^2 Adj	0.49	0.57	0.63
	Change	0.49***	0.09***	0.07***

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

7.4.8 Predicting binge drinking behaviour – hypothesis 4

To assess predicting self-reported binge drinking behaviour at time 2, a second forced entry hierarchical multiple linear regression was performed (Table 7.8). This was done in a similar manner to the previous studies though the variables were only entered into two blocks: the expected predictors of behaviour (1) intentions, PBC and habit; and the remaining variables (2) social desirability, drinking-identity, attitude, subjective norms, descriptive norms, UEA identity and group norms. With a Durbin-Watson score of 1.92, the assumption that errors in the regression

were independent were met and no collinearity was found within the data. Casewise diagnostics were run and no problems were found meaning this model was reliable and had not been influenced by any subset of cases.

Table 7.8 - *Predicting binge-drinking behaviour using intentions, PBC, habit, social desirability, drinking-identity, attitude, subjective norms, descriptive norms, UEA identity and group norms (N=242).*

	Variable	Step 1	Step 2
1	INT	0.46***	0.45***
	PBC	0.05	0.04
	HAB	0.29***	0.26**
2	Social Desirability		0.07
	Drinking-identity		0.07
	ATT		-0.02
	SN		0.06
	DN		0.01
	UEA ID		0.03
	GN		-0.08
	R ² Adjusted	0.43	0.43
R ² Change	0.44***	0.02	

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

When assessing the prediction of binge drinking behaviour, intentions, PBC and habit were able to explain 44% of the variance in binge drinking intentions (adjusted $R^2 = .43$, $F(3, 214) = 55.58$, $p < .001$). The addition of the remaining variables at step two did not produce a significant increase in the amount of variance explained. Intentions and habit retained a significant beta weight and were the only significant predictors of self-reported binge drinking behaviour at time 2.

7.5 Discussion

The present study examined how language based identity manipulations could affect antecedents of binge drinking and how health behaviours communicate identity. It also applied an expanded theory of planned behaviour (TPB) containing separate measures of habit, UEA identity, group norms, descriptive norms, social desirability and drinking-identity to the prediction of binge drinking intentions and behaviour among a sample of undergraduate students over a 1-week period. This section will first discuss how language identity manipulations influence the antecedents of decisions to binge drink. Then, how the TPB variables predict intentions to binge drink and how social identity variables (group norms and UEA identity), habit, drinking-identity

and social desirability contribute to the prediction of intentions and behaviour. Future implications of the research and strengths and weaknesses will conclude the chapter.

7.5.1 Language groups

A 2x3 ANOVA was carried out to establish if the language manipulation groups had an effect on intentions to binge drinking in the next week between those reporting having participated in a binge drinking session in the previous 30 days and those that had not, but no effect was found. To establish whether language could influence attitudes, norms, identity or any other antecedents of intentions to binge drink, ANOVAs were carried out for those answering positively and negatively to binge drinking in the last 30 days. Addressing hypotheses 1 and 2, we expected to see the noun-label self-descriptive language producing more positive explicit attitudes toward binge drinking and stronger drinking-identity scores for those having reported binge drinking in the previous 30 days compared to the verb-label self-descriptive language and the opposite trend (producing less explicit attitudes and weaker drinking-identity scores) for those reporting no binge drinking in the previous 30 days. The following sections will discuss the group comparison for binge drinkers and non-binge drinkers.

7.5.1.1 *Group comparisons for the binge-drinkers*

For the 'binge-drinkers' significant effect of group on subjective norms and PBC showed the language manipulation created significant differences between the control, verb and noun groups. Post hoc analysis to further investigate where the differences between groups lay suggested when identity was made salient through a noun association (As a binge drinker), participants believed significant others' were more likely to approve of binge drinking behaviours and held lower perceptions of control over carrying out the behaviour compared to those in the control group. The noun label group, the group more solidly identifying binge drinking behaviour as part of the participant's identity, was the group that appeared as significantly different from the control in both variables suggesting stronger identity associations affected normative beliefs and perceptions of control. The verb group did not differ from the control group suggesting that when binge drinking was more weakly associated with the self it would not elicit a decrease in perceptions of control or normative beliefs. This was an important finding as it highlighted PBC and subjective norms as important variables that may be prime targets for interventions as alternatives to using attitudes. As subjective norms appeared to be a significant predictor of binge drinking intentions and appeared significantly changed by an identity and language manipulation, it could be the focus of an identity based intervention for decreasing the amount of binge drinking in university undergraduates. Strongly associating the behaviour with the identity of the participant increased the participants' beliefs about how significant others would feel about their subsequent binge drinking, showing more positively favouring the behaviour. Associating less dangerous drinking

behaviours such as low and moderate levels of safe alcohol consumption with identity could possibly decrease binge drinking intentions over time.

7.5.1.2 Group comparisons for the non-binge drinkers

For the 'non-binge drinkers' significant effect of group on intentions was found showing the manipulation significantly changed between groups and post hoc analysis indicated the verb group, which more weakly associated the behaviour with identity, was significantly different than the control group. This suggested the weaker identity association was more effective in reducing intentions to binge drink for those who had relatively lower intentions to start. One reason the verb may have been more effective in this instance than the noun was that the noun label used (non-binge drinkers) may have been unfamiliar to the participants therefore unable to elicit a strong identity association with the behaviour.

7.5.2 An Expanded TPB predicting binge drinking intentions and behaviour

Hypothesis 3 and 4 stated an expanded TPB would be an effective model to use for predicting binge drinking intentions and self-reported binge drinking behaviour. The basic TPB variables of attitude, subjective norms and perceived behavioural control (PBC) were found to be predictive of intentions to binge drink explaining 49% of the variance in intention scores which was slightly more than in the previous studies at 46% and 43%. At the first step in regression analysis, attitude, subjective norms and PBC emerged as significant predictors as hypothesised. Undergraduates who had a positive attitude towards binge drinking, felt they had control over carrying out the behaviour and believed their best friends approved of their binge drinking had stronger intentions to engage in binge drinking over the next week. These results were in line with previous applications of the TPB in relation to alcohol consumption as research has shown all components of the TPB to be predictive of alcohol use intentions. The expanded TPB was able to explain 46% of the variance in the frequency of self-reported binge drinking at the one-week follow up with intentions emerging as a significant predictor. These TPB findings were also broadly in line with the previous studies of this thesis (45% and 47%) showing those with greater intentions to binge drink over the next week had higher frequencies of self-reported binge drinking behaviour at time 2. The additional variables of social desirability, drinking-identity, habit and descriptive norms were able to significantly increase the amount of variance explained in binge drinking intention and habit was able to significantly increase the amount of variance explained in self-reported binge drinking behaviour. These findings will be discussed further in the following sections beginning with attitudes, then PBC, norms, social desirability, drinking-identity and habit.

7.5.2.1 Attitude's predictive utility

Previous studies (Cooke et al., 2007; K. Johnston & White, 2003; Norman & Conner, 2006) have shown attitudes to be a consistent predictor of intentions to binge drink and this study supported those findings as attitudes appeared as a significant predictor of binge drinking intentions. This construct has appeared consistently as a reliable predictor of binge drinking intentions as shown in studies 1 and 2, making it an important antecedent on which to focus interventions. As mentioned in previous discussions, most research that has been aimed at reducing binge drinking behaviour has focused on reducing perceptions that heavy alcohol consumption was normative rather than focusing on changing attitudes. These results supported a move towards looking at attitude change alongside normative interventions as a possible tool to reducing binge drinking intentions and behaviour.

7.5.2.2 Findings regarding perceived behavioural control

Not unlike the previous studies, when all additional variables were considered as part of the expanded model in subsequent steps in the regression analysis, PBC was not predictive of binge drinking intentions but importantly subjective norms remained a predictor when considered as part of the whole model. The phenomena of PBC failing to contribute was found in the previous 2 studies in the thesis and its relationship in the model has been discussed in previous chapters. It did significantly correlate with intentions though and may have appeared to be a non-significant contributor due to some issue with the methods of gathering the data or structuring of the questionnaires. There may be considerations within the theory itself as elements such as PBC appeared weak or non-significant predictors in studies 1 and 2 and other studies (Cooke et al., 2007; Norman, 2011). Like Cooke et al. (2007), the mean for PBC (6.21) was high and standard deviation (1.09) was relatively low in this study suggesting there was a lack of variation in participants' responses. This likely undermined the impact of PBC in the analysis and this has been a driving factor for improvements and expansions to the TPB. It was for this reason that habit and identity constructs were tested in this study. Overall, in regards to binge drinking studies, PBC has consistently lacked in ability to predict intentions and behaviour therefore these findings were not a surprise.

7.5.2.3 Norms as part of the TPB

Contrary to the previous findings in study 1 and 2, this was the first study to find subjective norms appear as a significant predictor of intentions alongside attitude and perceived behavioural control (PBC). The role of norms in predicting health behaviours has been discussed throughout this thesis. There has been some debate about how well subjective norms can predict intentions and the group norms and descriptive norms components were specifically added to expand the TPB from the first study to address normative measure's inadequacy. Group norms, just as in all the

studies, did not predict intentions to binge drink in this research. But, study 3 produced the unique findings of descriptive norms being predictive alongside subjective norms. The evidence found for subjective norms as predictors of intentions, even when all variables were entered into the model, was interesting as it was different from the first studies. It was the first time subjective norms performed as predicted. This highlighted the often found mixed results and complexity surrounding norms measures. The reason the subjective norms measures used here might have been predictive of intentions for the first time in the third study was that they indicated a more proximal normative influence (unlike group norms which indicated what the broader group contextual normative beliefs were) for a larger sample.

The descriptive and subjective norm measures asked about what significant others (best friends) might think about the participant's binge drinking behaviour and about significant other's binge drinking behaviour. This finding suggested that normative influences in regards to binge drinking may be a function of the closeness of the relationships, with those individuals nearer, such as a best friend, exerting a more direct influence on intentions to binge drink (subjective and descriptive norms) than lesser known distant members of an in-group (group norms). Subjective and descriptive norms could be of use in interventions designed to alter drinking behaviours in young people where altering their behavioural beliefs about proximal others may change intentions. The findings that these norms predicted intentions after controlling for other variables is worth considering as Beck and Ajzen (1991) stated that attitudes, subjective norms and PBC vary in their importance depending on the behaviour. It is possible that subjective norms did not appear as important predictors of binge drinking in the first 2 studies due to the lower sample size. As with regression analysis, larger sample sizes with many variables has been preferable and may have been the difference here. In regards to the norms measures that did not contribute to the model, it seemed that larger group norms had less influence on binge drinking intentions than proximal norms like subjective and descriptive norms. The norm measures were significantly positively correlated but group norms lacked the predictive utility of the others. A suggestion for improving the measurement of group norms would be to narrow the measure down to mirror the measurements of subjective and descriptive norms. For example, the measure could simply include questions about other members of the group's binge drinking behaviours and what the other group members think of the participant's binge drinking behaviour.

7.5.2.4 Social desirability in the TPB

As expected, social desirability played a role in predicting intentions to binge drink in the next week (*hypothesis 3d*). Social desirability had a negative relationship in the regression analysis, similar to what we have seen previously with PBC, suggesting that higher social desirability reporters were less likely to intend to binge drink over the next week. This is in line with previous research suggesting that as binge drinking is often considered a negative health behaviour, higher

social desirability reporters will be less likely to report or participate in such behaviours as a way of maintaining a positive self-view and to adhere to social norms (Armitage & Conner, 1999, 2001; Beck & Ajzen, 1991).

7.5.2.5 Drinking-identity predicting intentions

As predicted in hypothesis 3e, stronger drinking-identity was predictive of greater intentions to binge drinking in the next week. Those who consider drinking alcohol as part of who they are, their identity, were more likely to report intending to binge drink in the next week. These findings were in line with previous research by Foster et al. (2014) and the previous two studies of this thesis showing that self-identity regarding alcohol plays an important role in the decision making process of young people to binge drink.

7.5.2.6 Habit as a part of an expanded TPB model

Habit strength significantly increased the amount of explained variance in binge drinking intentions. This was in line with the previous studies supporting habit strength having an additive effect in health related behaviours and intentions. As shown in table 7.7, increased habits surrounding binge drinking meant greater intentions to binge drink in the next week and more frequent self-reported binge drinking behaviour. When drinking-identity was added to the model, it moderated habit to some extent but it remained a significant predictor. The same was not true when predicting behaviour where identity did not moderate habit's contribution to the explained variance. Both of these findings regarding identity were contrary to the findings in Study 2 where we saw the self-identity measure (associating binge drinking as part of the self-identity) become an important predictor of intentions and behaviour fully moderating habit's contribution to the model. The difference in findings could be that the actual measures were slightly different, with the drinking identity measure used in Study 3 having been drawn from Foster et al. (2014) and the self-identity measure used in Study 2 from Hagger and Chatzisarantis (2006). Habit significantly increasing the explained variance of binge drinking intentions suggests that elements of automaticity affect intentions and behaviours. As many health behaviours are considered repetitive and often lead to the formation of habits and higher self-identification, habit and identity appear somewhat similar in regard to at least intentions. While habit and identity were strongly correlated throughout they were not markers of a unitary latent construct but were conceptually distinct (Gardner et al., 2012). As intention and habit appeared as significant predictors it could be that binge drinking behaviour was under the control of both intentional and habitual processes suggesting a complimentary relationship (Norman, 2011). In regards to binge drinking, habit seems to be an important element to consider when researching decision making processes across the three studies.

7.5.2.6.1 The habit-intention interaction

Verplanken et al. (1998) suggested that there was a habit-intention interaction that significantly increased the explained variance in behaviour. They saw weaker habits predicting behaviour significantly and as the habit strength increased the predictive power of intentions decreased. Examination of the data for each of the three studies exploring if the same was present for binge drinking behaviour was completed. The regression analyses including the habit-intentions interaction for all 3 studies are shown in Table 7.9.

Table 7.9 - Predicting binge-drinking behaviour using intentions, PBC, habit and HABxINT (habit x intentions interaction).

Study	Step	Variable	Adj R Square	F change	Beta
1	1	Intention	.56		.49***
		PBC			-.07
		Habit			.38***
	2	HABxINT	.56	.001	.15
2	1	Intention	.46		.48***
		PBC			-.06
		Habit			.25**
	2	HABxINT	.46	.004	.29
3	1	Intention	.44		.48***
		PBC			.05
		Habit			.28***
	2	HABxINT	.44	.00	.06

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

There did not appear to be any additional explained variance through the habit-intention interaction. It could be that for the transportation behaviours in Verplanken et al. (1998) this interaction was important but for binge drinking behaviours in undergraduates strength of drinking habits did not change how well intentions predicted behaviour.

7.5.2.1 An expanded TPB predicting binge drinking intentions and self-reported binge drinking behaviour

Some elements of the theoretical framework have been supported with the data, namely attitudes and subjective norms. An important key sections did fail to contribute as planned, PBC. As a key component of the TPB, it should have been a significant predictor of binge drinking intentions and was not but considering the findings of the previous two studies it was not a surprising finding. The expanded model, shown above in Figure 7.1, was able to explain 65% of the variance in intentions to binge drink in the next week with the additional variables of social desirability, drinking-identity, habit and descriptive norms significantly contributing to the model. The findings supported the idea that habit, norms and identity play an important role alongside attitudes in the decision making process of young people to binge drink.

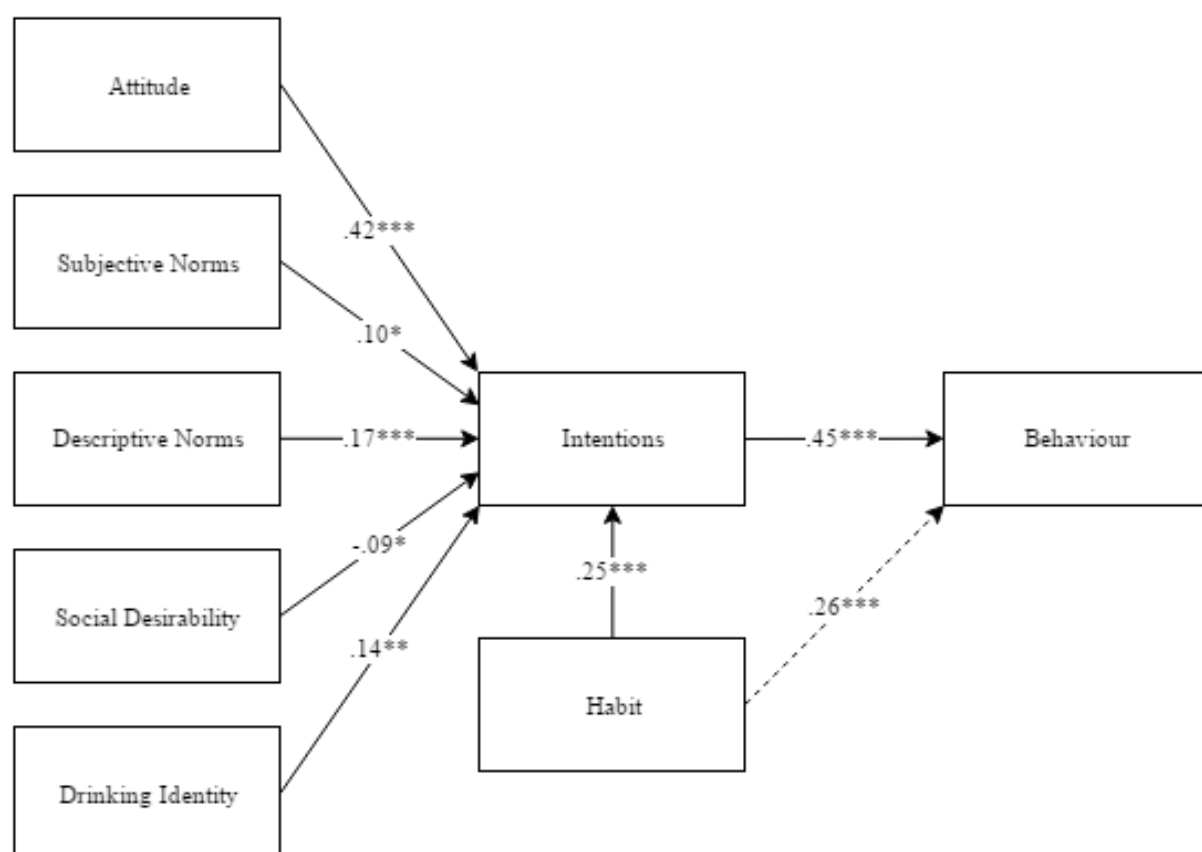


Figure 7.1. A schematic model of the expanded TPB (behaviour, intentions, attitude, subjective norms, descriptive norms, habit, social desirability and drinking identity)

7.5.3 Conclusion

This section will begin with a discussion of strengths and limitations of the research followed by suggestions for improvements and future implications.

7.5.3.1 *Strengths and limitations*

One strength of this study was that a large sample was successfully recruited from across the university. The sample included undergraduates from all years of study from a wide selection of schools (or departments). The diversity and size of the sample enhances the applied value of the study as well as providing useful theoretical insights. Data for study 3 was gathered entirely through online questionnaires. This feature not only made accessing and completing the questionnaire easy for the participants by making it possible to take part anywhere they were able to access the internet but also allowed anonymization of the data minimizing self-report bias as binge drinking is typically seen as negative. Also, the measure of past behaviour (have you binge drank in the last 30 days?) allowed a comparison of the two groups that were not possible in the first two studies. Another strength is the inclusion of a measure of social desirability. Including this measure allowed us to assess if the participants' desire to provide answers they thought socially acceptable would significantly influence the outcomes. This was another method of covering the problem of self-report bias.

When interpreting the findings of this study, note should be taken of potential methodological limitations. First, most of the measures used were self-report but this issue has been discussed in the previous studies showing this was nearly unavoidable for some constructs and was a well-documented way of gathering reliable data in regards to binge drinking behaviours. It could be of use to gather objective measures of alcohol use (e.g. drinking diaries) and to examine the power of the TPB to predict such a behavioural measure in future studies. A further limitation of study 3 includes the actual noun and verb labels used to elicit identity associations. In one instance the verb label appeared to have a stronger effect than the noun label which was contrary to the expected findings. Separate research to distinguish which labels were easily understood and properly elicited the appropriate identity could have been done. This could have included a brief focus group or short questionnaire with a list of labels to rate. This may have increased the differences between groups and improved the result to support more of the hypotheses. Beyond these basic issues, the use of only noun and verb labels may have been limiting in that other parts of speech may also have conveyed strong identity signals that may have influenced aspects of decision making. It would be useful in future research to test whether parts of speech, such as adjective (e.g. athletic, healthy and confident) could put across similar essentialist implications to the noun labels, maybe influencing more than just subjective norms and PBC.

Even considering the limitations, the research did support the TPB model and was in line with previous research suggesting that drinking identity and habit along with components of the TPB are predictive of binge-drinking behaviours in young people while also showing that identity signalling with noun-labels could influence aspects of the decision making process to binge drink.

7.5.3.2 Future implications

To discuss future implications and directions, this work showed descriptive norms and subjective norms, habit, drinking-identity, social desirability and attitude were important predictors of intentions to binge-drink, therefore, future research could build on these findings. The research points towards many factors that may be specific to the behaviour researched but may also be relevant when looking at other health related behaviours. Further studies using habit and drinking-identity should be carried out to establish the relationship between the two. This research also showed participant's desire to shape their own identities could be harnessed to possibly change perceptions of control and their subjective norms. In practical terms, noun-based wording could be used to frame behaviours as part of the self-identity to increase a person's normative beliefs about their significant others and lower their perception of control over a behaviour. Using this method with healthier noun labels, such as 'As a non-drinker' or 'As a moderate drinker' could possibly reduce binge drinking intentions.

The result also have implications for understanding the nature of the self by implying language may be an important method through which people create and maintain a sense of self: who we are, what our attitudes are and possibly who we would like to be (Walton & Banaji, 2004). By using self-descriptions, we are reinforcing portions of our identity by labelling them, basically self-categorizing (Hogg & Reid, 2006). Future research could consider extending the present study by assessing whether different noun-labels could possibly influence subjective norms and PBC as well as any other antecedents of decision to binge drink. One possible direction to take would be to use the basic TPB model with a larger sample size applying the same group manipulation with the addition of alternative noun labels. Using noun-labels with healthier labels (I am a casual drinker) might be useful in comparison with the noun-label used in this study. If these results are further supported, it may suggest associating any unhealthy hazardous behaviours directly as part of the self should be avoided as it could reinforce the behaviour as part of the identity, possibly increasing drinking occurrences and chances of health risks. As Walton and Banaji (2004) suggested people describe themselves to others in an attempt to characterize themselves accurately and listeners interpret the descriptions as reflecting self-image. With this coordinated communication occurring, speakers come to be who they say they are.

8 Chapter 8: General discussion: Implications for theory, method and policy

8.1 Chapter overview

This chapter will begin with a brief summary of each study and an overview comparing the findings of all studies. Theoretical considerations, strengths and limitations of the research will be presented followed by the implications of the overall findings and how they can inform future health promotions and alcohol-related education geared towards safer drinking practices in young people. Then, the final conclusions will be discussed.

8.2 Summary of findings from each study

This section will discuss each of the 3 studies individually offering a summary of the methods and findings. It will begin with study 1, an application of an expanded TPB to the prediction of binge drinking through an online questionnaire over a 1 week period. Study 2, a lab-based social identity experiment which included an expanded TPB questionnaire, will follow. Finally study 3, the online language based social identity experiment which included an expanded TPB questionnaire will conclude.

8.2.1 Study 1

Study 1 consisted of a longitudinal (one week follow-up) design of an expanded theory of planned behaviour (TPB) questionnaire to explore the decision making process of young people to binge drink. The expanded model contained additional measures of habit, impulsivity and social identity constructs to the prediction of binge drinking among a sample of undergraduates at UEA. The results showed support for the expanded TPB model predicting binge drinking in young people. In terms of predicting intentions to binge drink in the next week, the TPB made a significant contribution explaining 46% of the variance. Of the TPB variables, attitude was the only variable that significantly predicted intention while subjective norms and PBC lacked predictive utility in predicting binge drinking intentions over a one week period. Some of the additional variables also contributed to predicting intentions. Habit explained an additional 6% of variance in binge drinking intentions while UEA identity and self-identity also appeared as significant predictors of intentions explaining a further 6% of the variance. Impulsivity and group norms lacked predictive utility regarding intentions as part of the expanded model suggesting that they did not play a significant role in decisions to binge drink. The expanded model predicting binge drinking intentions was able to explain 66% of the variance. Self-reported binge drinking behaviour was strongly predicted by intentions, explaining 46% of the variance while habit explained an additional 6%. The contribution of PBC continued to be inconsistent failing to predict binge drinking behaviour as hypothesised. The model was able to explain 60% of the variance in binge drinking behaviour.

8.2.2 Study 2

An identity based intervention was employed in study 2 to assess how social identity affected decisions to binge drink. How implicit associations contributed to explaining binge drinking intentions and behaviour were also tested as part of an expanded TPB model.

8.2.2.1 Details of study 2

122 UEA undergraduates (male $n=27$, female $n=95$) took part in an experimental lab-based computer task. As with the previous study, study 2 also applied a longitudinal (one week follow-up) design with an expanded TPB questionnaire containing separate measures of habit, impulsivity, self-identity, group identity, descriptive norms and group norms to predict binge drinking intentions and behaviour. Additionally, it included a social identity intervention, an alcohol identity implicit association test (AI-IAT) and an arousal implicit association test. Participants were randomly allocated to one of four experimental groups to test whether associating binge drinking behaviour with social identity influenced antecedents of decisions to binge drink. The experimental groups were: in-group (UEA undergraduates); out-group (Essex University undergraduates); an identity-neutral health campaign (alcohol has negative health impacts) and control (with no identity or health information about alcohol). The in-group and out-groups were chosen based on an existing university rivalry between Essex University and UEA which includes an annual sports derby. The alcohol identity IAT tested participants' implicit associations with alcohol and the 'self' while the arousal IAT tested participants' implicit associations of alcohol with positive and negative arousal words.

8.2.2.2 Study 2 findings

ANOVAs of the four experimental groups showed significant effects for attitudes and intentions meaning that for these two constructs there were significant differences between some of the experimental groups. Post hoc analysis revealed that explicit attitudes were significantly less positive in the health campaign and out-group associations than those reported by participants in the control group. The analysis also highlighted that participants in the health campaign reported significantly less intentions to binge drink in the next week compared to the control group. The in-group and out-group associations were never significantly different from each other on any of the examined variables. The identity manipulation findings suggested identity did not play a role in reducing explicit attitudes towards binge drinking independently of a health campaign, and the health campaign was more effective at reducing intentions to binge drink than identity associations.

The alcohol identity IAT showed that participants had more favourable automatic associations towards 'alcohol and me' than 'water and me' suggesting they associated alcohol more with the self than they did water. The results of the arousal IAT were similar in that participants had more

favourable automatic associations towards ‘alcohol and good’ than ‘non-alcohol and good’ suggesting they associated alcohol more with positive arousal than non-alcohol.

The TPB variables were able to predict 43% of the variance in intentions to binge drink in the next week with attitudes emerging as the only significant predictor of intentions. When the additional variables were added (arousal IAT, AI-IAT, descriptive norms, habit, impulsivity, group norms, UEA identity and self-identity) as part of the expanded model it explained 75% of the variance in intentions to binge drink and self-identity emerged as the only other significant predictor of intentions alongside attitudes.

The TPB variables were able to predict 45% of the variance in self-reported binge drinking behaviours with intentions emerging as the only significant predictor. When the expanded model was considered arousal IAT and self-identity appeared as significant predictors of self-reported binge drinking behaviours explaining 57% of the variance.

8.2.3 Study 3

In study 3, a language based social identity manipulation was tested to assess how social identity affected antecedents of binge drinking and how health behaviours communicated identity. As with previous studies, an expanded TPB model was used to examine decisions to binge drink with the additions of social desirability and self-reported drinking identity (SRDI) and the exclusion of measures of impulsivity.

8.2.3.1 Details of study 3

UEA undergraduates were recruited to take part in an experimental online task. Respondents were first asked if they had participated in a binge drinking session in the previous 30 days, yes or no. They were assigned to the ‘binge drinker’ (yes) or ‘non-binge drinker’ (no) group accordingly. The task then consisted of a language based social identity intervention and an expanded TPB questionnaire. The social identity intervention included 3 groups: a noun group (As a binge drinker/As a non-binge drinker); a verb group (As someone who binge drinks/As someone who does not binge drink) and a control. Participants were randomly assigned to one of the 3 experimental groups. For the language groups, each label appeared at the top of each page of the questionnaire to be sure the identity (e.g. binge drinker) was made salient. The expanded TPB contained separate measures of habit, descriptive norms, drinking identity (SRDI), social desirability, group norms and UEA identity to the prediction of binge drinking intentions and behaviour among the sample over a 1-week period. 313 undergraduates from across schools of study at UEA took part (male n=83, female n=230).

8.2.3.2 *Study 3 findings*

For those reporting ‘yes’ to binge drinking in the last 30 days, ANOVAs of the three experimental groups showed significant effects on PBC and subjective norms meaning that for these two constructs there were significant differences between some of the experimental groups. Post hoc analysis revealed when identity was made salient through the noun association, participants were more likely to report that significant others’ approved of binge drinking behaviours (subjective norms) and hold lower perceptions of control over carrying out the behaviour compared to those in the control group. ANOVAs of the experimental groups for those reporting ‘no’ to binge drinking in the last 30 days, found significant effects on intentions showing the manipulation significantly changed between some of the groups. Post hoc analysis indicated the verb group, which more weakly associated the behaviour with identity compared to the noun label, was significantly different than the control group. The verb association lowered intentions to binge drink over the next week for non-drinkers.

The TPB variables were able to predict 49% of the variance in intentions to binge drink in the next week with attitude, subjective norms and PBC emerging as significant predictors of intentions. When the additional variables were added at Step 2 (descriptive norms, habit, drinking identity, social desirability, group norms and UEA identity) as part of the expanded model they explained 65% of the variance in intentions to binge drinking and descriptive norms, habit, drinking identity and social desirability emerged as significant predictors.

The TPB variables were able to predict 39% of the variance in self-reported binge drinking behaviours with intentions emerging as a significant predictor of behaviour. Habit appeared as the only other significant predictor of binge drinking behaviours and together with intentions explained 44% of the variance in self-reported binge drinking behaviour over a one week period.

8.3 **Overview comparing all studies**

This section will compare all three studies, providing an overall summary of the research as a whole. It will begin by discussing the support for using social cognitive models in the prediction of binge drinking behaviours followed by the use of self-identity measures, the constructs lacking predictability and the unsuccessful identity manipulations. Table 8.1 shows variables predicting intentions to binge drink over the a one week period while Table 8.2 shows variables predicting self-reported binge drinking behaviour for all three studies.

8.3.1 **Support for social cognitive models in the prediction of binge drinking intentions and behaviour**

The findings of this work supports the use of social cognitive models in the prediction of binge drinking in young people as a significant amount of variance was explained through the expanded TPB models. The TPB (Beck & Ajzen, 1991) provided an excellent framework to conceptualise,

measure and identify which factors affect binge drinking behaviour and on which intervention efforts could focus (Rimer & Viswanath, 2015). Though the TPB model was an effective method of predicting binge drinking intentions and behaviour, there was only partial support as attitudes was the *consistent* predictor of intentions.

Table 8.1 - *Forced hierarchical multiple linear regression analysis for all variables across all studies predicting binge drinking intentions over a one week period.*

Variable	Study 1	Study 2	Study 3
Attitude	0.40***	0.26***	0.42***
Subjective Norms	0.02	0.04	.10*
PBC	0.06	-0.04	0.06
Habit	0.14	0.08	0.25***
Self-Identity	0.27**	0.57***	-
Drinking ID (SRDI)	-	-	0.14**
UEA ID	0.12*	0.09	0.00
Group Norms	0.05	0.03	0.01
Descriptive Norms	0.02	0.04	0.17***
Social Desirability	-	-	-0.09*
AI-IAT	-	-0.01	-
Arousal IAT	-	0.05	-
Impulsivity - Pre	-0.07	0.10	-
Impulsivity - Urge	0.00	-0.01	-
Impulsivity - SS	0.11	0.02	-
Impulsivity - Pers	-0.05	-0.07	-
Variance Explained	66%	75%	65%

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

The traditional conceptualisation of norms and PBC was weak regarding binge drinking (Norman & Conner, 2006). Though subjective norms were predictive in Study 3 as part of the complete expanded model, it appeared that other normative measures, including those associated with social

identity, were better suited to predicting binge drinking intentions over a one week period. This finding was in line with previous work (Ajzen, 2011). Many participants in these studies considered binge drinking as a behaviour undergraduates did often which fit well with the normative influences on intentions as part of social identity (Abrams & Hogg, 1999). Students reported having more positive explicit attitudes towards binge drinking and those that reported having a stronger UEA student identity were more likely to report greater intentions to binge drink. Using additional measures of social identity, particularly self-identity, improved the predictive utility of the TPB model which suggests regarding binge drinking behaviours, social identity plays an important role in forming attitudes as part of a group and in the overall decision making process of young people to binge drink.

Table 8.2 - *Forced hierarchical multiple linear regression analysis for all variables across all studies predicting binge drinking behaviour over a one week period.*

Variable	Study 1	Study 2	Study 3
INT	0.52***	0.36***	0.45***
PBC	-0.03	-0.03	.04
Habit	0.33**	0.12	0.26**
AI-IAT	-	0.11	-
Arousal IAT	-	-0.20*	-
Impulsivity - Pre	0.22**	-0.05	-
Impulsivity - Urge	0.08	0.00	-
Impulsivity - SS	-0.04	0.05	-
Impulsivity - Pers	-0.03	-0.09	-
Variance Explained	60%	57%	44%

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

8.3.2 Self-identity measures as important predictors

Support was shown for using social identity measures (Terry et al., 1999) as a component in predicting binge drinking intentions over a one week period. Some questions were raised about how self-identity regarding drinking alcohol should be measured, either with the simple 2-item measure used in study 1 and 2 or with the SRDI used in study 3. They both appeared as significant predictors of intentions but the 2-item measure had greater impact whereas the SRDI seemed to

interact less with habit. It would be interesting to further explore the relationship between self-identity measures and habit in an expanded TPB model (Gardner et al., 2012).

8.3.3 Considering the unsuccessful

Some of the additional variables were not predictive as planned. Implicit associations regarding alcohol (Jajodia & Earleywine, 2003) failed to predict intentions to binge drink as hypothesised but this could have been due to individuals holding ambivalent attitudes towards alcohol (de Liver et al., 2007). Group norms, or how much participants viewed binge drinking as a behaviour in which undergraduates did often, also did not predict intentions but this may be due to group norms effecting intentions and behaviours as a more distal component possibly through UEA identity. Impulsivity lacked predictive utility overall which may be due to the nature of binge drinking behaviour in a university setting where habit and social variables are more determinant of the outcome of decisions to binge drink.

Regarding the identity manipulations (Terry et al., 2000) in study 2 and 3, the results showed they were not effective as hypothesised. This could have been due to the in-groups and out-groups used (Essex University vs UEA) or noun labels (binge drinker/non-binge drinker) which may not have elicited a strong group association or that possibly identity was not an effective tool at influencing decisions to binge drink over a one week period. Still, there was some indication that identity would be effective if given the right in-group/out-group associations or labels and context to make a group identity salient. This could be done through rigorous examination of strong out-groups for each individual before completing the experiment to be sure an appropriate out-group association was used during the manipulation. Though the findings in Study 3 did not support the hypothesis that essentialist language such as a noun label would be more effective at changing antecedents of decisions to binge drink than a verb label (Gelman & Heyman, 1999), it did suggest that identity could alter perceptions of control and some normative beliefs held by participants.

8.4 Theoretical considerations

This section will discuss the theoretical considerations regarding the findings of this research. The section will begin with a discussion of the traditional norms measure in the TPB followed by social identity as a useful addition in determining behaviour in the peer-influenced decision-making of students. Then, the weaker role of perceived behavioural control and the role of habit in binge drinking behaviour will be discussed before moving on to the strengths of the research.

8.4.1 Measuring norms as part of the TPB

One question raised through the findings of this research is could it be reasonable to look at dropping or replacing subjective norms as part of the TPB regarding certain behaviours like binge drinking? Some researchers have argued the subjective norm relationship with intentions is the weakest in the TPB model (Terry & Hogg, 1996; White et al., 1994). They don't often contribute

to the prediction of binge drinking intentions and a reconceptualization of norms in the TPB from a social identity/self-categorisation theory perspective has been supported (K. Johnston & White, 2003). Fishbein and Ajzen (1975) stated the relative importance of attitudes and subjective norms as predictors of intentions would vary as a function of the specific population and behaviour under consideration and as we have seen in the studies carried out as part of this thesis other measures such as descriptive norms, habit and self-identity were better predictors of UEA undergraduates intentions to binge drink. The descriptive norms measure (how often does your best friend binge drink?) was closer to a social norms measure than subjective norms and was a better predictor. This suggests at least for this population of undergraduates regarding the health behaviour of binge drinking, subjective norms play a smaller role in the decision making process and that wider social norms and identity measures such as self-identity and descriptive norms play a larger role.

8.4.2 Social identity influence on behaviour

The social identity variables used as part of this research, UEA identity and self-identity, did add to the prediction of intentions to binge drink showing that social influences play an important role in the decision making process of young people. Terry and colleagues (Terry & Hogg, 1996; Terry et al., 1999) suggested a social identity theory/self-categorisation theory perspective on the role of social influence in the attitude-behaviour relationship differed greatly from the one outlined by the TPB models. The TPB approach conceives social pressure as being additive across all referents groups or significant others (subjective norms) tied to contextually salient membership in specific social groups that are behaviourally relevant but does not account for the strength of identification with the significant others or groups (K. Johnston & White, 2003). The social identity theory/self-categorisation theory perspective suggests that the stronger one identifies with a group the stronger the influence of the referent group norms on intentions (Terry & Hogg, 1996). Therefore, subjective norms would have less impact in determining intentions whereas perception of the group norm for strong group identifiers would be better predictors of behavioural intentions. Based on the formation of attitudes, people are not always looking for others approval (subjective norms) but possibly a social environment allows certain attitudes held to be more easily expressed (e.g. lots of political attitudes in a political setting are much more easily expressed than when in a non-political environment). What the in-group members, in the case of this research 'UEA undergraduates', are doing may matter more for binge drinking behaviour at university due to proximity whereas best friends or family may no longer be part of the in-group and may become more distant from the day-to-day lives of the students having less impact on their decisions to binge drink.

As the SIT suggests people define and evaluate themselves by a self-inclusive social category such as gender, profession or student (Hogg & Reid, 2006) and self-categorization entails being aware of differences between in-groups and out-groups, it stands to reason that a UEA undergraduate understands that they are at university with other undergraduates and that binge drinking may be

a typical behaviour of this in-group. When the undergraduate's UEA student identity is made salient, they would be expected to use available shared information to construct a context-specific group norm which would describe and prescribe beliefs (that binge drinking is something UEA undergraduates do often), attitudes (positive feelings towards binge drinking) and behaviours (more frequent binge drinking occasions) that optimally minimize in-group differences and maximize intergroup differences. The in-group norms influence the process of self-categorization, meaning the UEA undergraduate adopts more normative attitudes and behaviours transforming their previous self-perceptions, beliefs, attitudes and behaviours to be defined in terms of the group prototype rather than unique properties of the self (Terry et al., 1999). According to Terry et al. (2000) the lack of evidence linking subjective norms to behavioural intentions, as they are not tied to a behaviourally relevant reference groups, should be expected. Subjective norms could influence intentions to engage in binge drinking behaviour but the extent to which the group membership appears salient as basis for self-definition should be taken into account like it was in this research. The studies carried out here further support evidence that the extent of attitude-behaviour consistency is influenced by the attitudinal congruence of in-group normative information (Terry et al., 2000). Overall, as subjective norms measures in the TPB have been criticised for being weaker and appeared so in this research, there is further interest in using social identity to capture the role of norms in attitude-behaviour relations.

8.4.3 Perceived behavioural control and binge drinking

When applied to binge drinking, perceived behaviour control can be less important as we found in this research. It seems that constructs such as habit and automaticity can interrupt the control processes and be better predictors of intentions and behaviour. Alcohol companies often claim individuals have control over drinking behaviours but addiction and problematic drinking patterns still occur frequently (L. Johnston, O'malley, Bachman, & Schulenberg, 2011). Questions have arisen about how control and automaticity interact and why PBC would not necessarily be predictive as expected in the case of binge drinking behaviours. PBC did not emerge as a significant predictor of binge drinking intentions when considered as part of the expanded TPB model in this research but like many applications of the TPB to alcohol studies, a negative relationship was found between PBC and intentions (Topa & Moriano, 2010). This suggests low perceptions of control are associated with strong alcohol-use intentions. This effect was seen in both correlation and regression analyses of all three studies suggesting that it was not merely a statistical artefact (Conner and Norman, 2006) but also that those participating in risky drinking may have a more external locus of control than those with lower-risk drinking practices (Donovan & O'Leary, 1978; Norman & Conner, 2006). This could mean intentions to engage in binge drinking may be the result of external pressures to drink over which the individual has less control (e.g. pub crawls) or they may find themselves in a situation where habit plays a more proximal role (e.g. on a night out therefore has a drink). According to Norman et al. (1998) those who binge drink are more likely to cite a wider range of factors such as celebrating an event and being at a

party as important influences on their drinking behaviour. Collecting more data surrounding binge drinking occasions (e.g. others present or location) may provide more information regarding control factors and external influences on intentions.

Another consideration would be to measure behavioural control with an alternative scale. TPB studies have used a variety of methods to measure perceived behavioural control (e.g. strength of self-efficacy, sum of perceived barriers or others using one or more scales) and choosing an appropriate scale for each behaviour may be key (Godin & Kok, 1996). There has been research that shows drink refusal self-efficacy (DRSE), or control over refusing an alcoholic drink, contributes unique variance to the prediction of drinking among undergraduates when positive and negative alcohol expectancies are controlled (Oei & Morawska, 2004). Further work shows that DRSE can be a reliable predictor of risky alcohol use, even mediating the effects of alcohol expectancies and impulsivity (Gullo, Dawe, Kambouropoulos, Staiger, & Jackson, 2010). DRSE is different from the traditional PBC in the TPB and could be a better measure of control in undergraduates' decisions to binge drink as it encompasses three dimensions: 1) drinking directed towards affect regulation or emotional relief such as when experiencing stress or anxiety; 2) drinking involving social setting such as parties or nights out; and 3) drinking when an opportunity arises such as being handed a beverage (Foster et al., 2014).

8.4.4 The role of habit in the TPB

Habit was a useful additional component to the expanded TPB model used throughout this research to explain binge drinking intentions and behaviour (Norman, 2011) and represented trajectories of reasoning that were more heuristic than deliberative (Chen & Chao, 2011). Behavioural action can become more automatic with time and the habit measure here seemed to provide an independent role in explaining behaviour apart from intention and interacted with the intention-behaviour relationship (Triandis, 1977). It could be possible that undergraduates form routine binge drinking behaviours and when in a particular situation such as taking part in a drinking game, these routine behaviours are elicited without deliberate decision making. Some have argued that past behaviour is the best predictor of future behaviour (Bamberg et al., 2003) and this has been held as evidence for habit complementing the reasoned mode of operation assumed by models like the TPB because it is an example of a dual process model when viewed this way (with a fast heuristic route and a slow deliberative one). As useful as it may be, consideration should be given in regards to habit and consuming alcohol as very high habit scores could be reflective of problematic drinking or addiction and may reflect a strong drinking identity (seeing binge drinking as part of the self). One example is unhealthy amounts of alcohol might be consumed often and without much thought for reasons associated with the mental health of the individual (relief of anxiety) or because of constant external and situational pressures to do a behaviour that has not been measured directly (Ajzen, 2002b). Habit did appear to be an important component regarding binge drinking behaviour in this research and looking at this construct in more depth in future could be useful.

This could mean collecting information surrounding each binge drinking occasion using methods such as drink diaries or wearable technology like a SCRAM bracelet which measures blood alcohol content (Leffingwell et al., 2013) could provide data about external influences of drinking behaviours and amounts of alcohol consumed. These additions could improve not only the control measurements in the TPB but also draw attention to the behaviour for the individual which may disrupt automatic processes, breaking the habit-behaviour link and decreasing risky drinking behaviours (Verplanken et al., 1998).

8.5 Strengths of the research

The studies conducted here have a number of theoretical and methodological strengths. The research carried out in this thesis was made up of complex studies with expanded models of TPB and social identity interventions. These interventions attempted to alter attitudes and identity associations to change outcomes of decisions to binge drink in computer-based lab and online experiments. The studies were longitudinal in nature, taking place over a one week period, and participants were randomly allocated to each treatment group to ensure there was no selection bias. The research also tapped into processes which we know are important considerations in the decision making process, for example looking at implicit versus explicit attitudes and impulsivity versus habit.

Further strengths include the success of recruitment where many different methods were employed, from emails and bulletins about the studies to social media appeals on UEA group sites. Samples of undergraduates were selected to ensure that the result were representative of the UEA undergraduate population. For the most part, the undergraduate samples were large and diverse including participants from across schools at UEA, from a range of ages and years while also including international undergraduates. This provided a fairly accurate representation of the undergraduate population at current universities across the UK. This enhances the applied value of the research.

Another strength was the relatively low attrition rates achieved throughout, never above 27%. This could be attributed to the methods of data collection used where access through the online questionnaires allowed lower barriers to participation for the time 2 behaviour questionnaires. The use of questionnaires to collect data was another specific strength as the online formats provided greater anonymity for each respondent. It was also a good way of measuring attitudes, was an efficient inexpensive method of collecting larger amounts of data and provided quick turnaround for analysis. The use of questionnaires made it possible to provide clear documentation of the measures used for other researchers to assess the validity of the findings or to replicate the research easily. It also made it possible to control for the effects of extraneous variable that could lead to misinterpretations of causality.

The research used descriptive norms as Ajzen (2011) suggested alongside the traditional TPB measures. This made it possible to measure both the social pressures to engage in binge drinking based on the perception of what significant others approved of and of their observed or inferred behaviour. Well tested social identity measures (Foster et al., 2014; Hagger & Chatzisarantis, 2006) and a measure of binge drinking habits (Gardner et al., 2012) allowed us to address criticisms of the TPB by measuring elements of self-identity and automaticity.

This research project helped to obtain a better understanding of the decision making process of young people to binge drink. It was successful in the extent to which the basic TPB predicted young peoples' binge drinking while also extending the framework of the TPB incorporating a range of variables (e.g. descriptive norms, habit and self-identity). It highlighted the use of social identity interventions in some form may influence the decision making process and provided a glimpse into the prevalence of binge drinking in undergraduates. Many methodological strengths were based on suggestions from previous research and steps were taken to ensure the theoretical framework was well constructed. Even with these strengths, it is important to acknowledge there were limitations as well which will be discussed in the following section.

8.6 Limitations

Though the research in this thesis has many strengths there were some limitations to be considered and these will be discussed in this section. Many of the limitations were covered in appropriate chapters and suggestions for improvements have been made but overall steps were taken to ensure the methodology was sound. For each study, measures were adapted from previous research and resembled their predecessors as closely as possible or in cases of replication, exactly. Their validity were checked and the models appeared robust compared to previous research. In each successive study, an effort was made to make corrections in the direction suggested by the previous research. By no means was this an exhaustive piece of research but within the scope of time allowed provided valuable insight into the decision making process of young people to binge drink.

One limitation was the use of mostly questionnaires to collect data. This method provided occasional missing data, relied heavily on self-report and allowed possible reactive effects such as social desirability (though this was assessed particularly in study 3). Also, many kinds of information may be difficult to gather through structured data collections particularly on sensitive topics such as binge drinking. This method of measurement may have also created an unnatural situation that made the participants feel alienated and some argue that a reduction of data to only numbers results in lost information that could be valuable.

There was some question about whether the identity groups in study 2 were different enough to elicit a strong in and out-group association to the point of influencing the outcome variables. It was thought that using a UEA student identity would be effective as an in-group while using Essex University undergraduates as an out-group. Essex University was close in proximity and

considered a rival in sports activities. The in-group and out-group identity associations did not significantly differ in the research suggesting that they may have only made the superordinate student identity salient. This might have led the participants to associate binge drinking more with the student identity in both instances making the hoped out-group condition more like the in-group condition. Also, an inflated out-group association like the one found in study 2 (Essex undergraduates drink more often) may limit the practical utility of an identity manipulation as practitioners may not feel comfortable providing inflated normative behaviours to the public. It will be important for future work to consider if a similar effect can be accomplished through accurate out-group associations or with a more vague description with an in-group association such as ‘the majority of university undergraduates are binge drinking less.’ Another consideration for improvement could be the delivery method in which the identity association were administered. In study 2, the participants read about the groups onscreen through a brief informational slide. This was a fairly short exposure and using a method which extends the salience of the associations, for example employing flyers in student accommodation for a week, may be more effective.

The language manipulations used noun and verb labels to make identity salient to different degrees. Having an easy to understand, valid label, would be important in achieving an effect and there was some concern that the labels used in study 3 may have been ineffective due to the participants possibly having been confused by the meaning of the labels. Particularly, ‘non-binge drinker’ seemed to be an issue therefore more should be done in future to assess which noun labels are easily understood.

8.7 Implications for interventions

The findings have a number of implications for interventions aimed at reducing the prevalence of binge drinking behaviours in university students. Interventions that are effective have the potential for significant impact on alcohol related diseases, deaths and cost to health care. This thesis has provided evidence that identity manipulations could decrease intentions to binge drink and possibly lengthened exposure to targeted identity associations in real world situations could in turn influence behaviour. These types of interventions would also be beneficial from a cost-benefit perspective as they would be relatively inexpensive and brief. Flyers, posters and social media campaigns could be distributed throughout campus and across social media associating binge drinking with an effective out-group or associating a less compatible behaviour like a healthy lifestyle (e.g. eating healthy, regular exercise) with an in-group such as UEA undergraduates.

Further, descriptive norms had a larger regression coefficient when predicting intentions than subjective norms suggesting that observing binge drinking in others may be of greater importance in decisions to binge drink than social pressure from significant others. Therefore when considering designing interventions, organising groups in a way that people who are not binge drinking are in the majority could be beneficial in promoting healthier intentions (Trafimow & Finlay, 1996). It may be useful to suggest that a high percentage of peers are actually engaging in

fewer binge drinking sessions alongside health campaigns that highlight the dangers of risky drinking practices. This type of intervention and health campaign could be carried out on a university campus or as part of social clubs where risky drinking practices are more common.

Habit and self-identity played an important role in predicting behaviour. Using strategies to change attitudes such as persuasion techniques in educational programs may be ineffective when habits are strong as the intentions and attitudes of individuals with strong habits are unrelated to their behaviour (Verplanken & Aarts, 1999). Breaking habits or changing identity may require time and repetition of interventions as those with high habits are less likely to attend to new information as easily as those with low habits (Marlatt, 1980). Therefore, the identity and language associations used in this research maybe useful tools when employed in a repetitive manner. It may also be beneficial to design an intervention that effectively creates new habits that promote healthier drinking habits. These new habits then may change the attitudes and beliefs that form the individual's identity regarding binge drinking.

As alcohol has been part of the campus culture for some time, more could be done by the universities and NUS to encourage weakening the relationship between binge drinking and student identity. When considering the safety of undergraduates, from greater risks of sexual assault and STIs to vandalism and property damage, improving the student experience should be a priority. Reducing the availability of alcohol on campus or increasing associations with less risky levels of drinking are small steps universities could take to improve safety and are relatively easy to implement quickly and effectively.

Together, these findings should have an impact on future research as it has highlighted important constructs that are important to the decision making process to binge drinking beyond that of the traditional TPB model. When considering undergraduates binge drinking, habit and social identity seem to play an important role alongside attitudes showing further support for dual processing models and using the social identity theory to explain further variance. The research has helped to further understand the decision making process of young people to binge drink over a one week period and offered some insight into how successful identity interventions might be when applied in a university setting.

8.8 Conclusions

The overall aim of this research project was to better understand how young people make decisions about whether or not to engage in binge drinking while also improving our ability to predict the behaviour. This understanding could help to inform the design of education and health promotion materials for binge drinking interventions. This research provided further information regarding the psychological processes that underpin health behaviours and importantly the commonly held assumption that generalised, trait-like dispositions such as the aspects of identity affect behaviour through their effects on the TPB variables (Hagger et al., 2007). Overall, the TPB has provided a

useful conceptual framework for addressing the complexities of undergraduates' binge drinking behaviours in the UK. It has incorporated central social and behavioural concepts and defined them in a way that permits prediction and understanding (Beck & Ajzen, 1991).

Attitudes towards binge drinking, subjective norms with respect to binge drinking and perceived control over binge drinking were found to predict intentions to binge drinking with varying degrees of accuracy. Intentions to binge drink were found to account for a considerable portion of variance in self-reported binge drinking behaviour. Even with the successes of the TPB, there were still issues to resolve. When the full expanded model was considered, PBC did not significantly contribute as planned leading to a conclusion that perceptions of control over binge drinking in the next week were not an important predictor of intentions when variables such as identity and habit were considered. It is likely that many students have low barriers to accessing alcohol and carrying out the behaviour as it is readily available on campus, at pre-drinking sessions or house parties and student nights out in the city. Subjective norms were also a weaker predictor in the TPB further supporting the notion that other normative measures should be added in regards to binge drinking for undergraduates in particular. Findings that descriptive norms were a better predictor of intentions than subjective norms suggested that what significant others or best friends did (if they were binge drinkers themselves or not) was more influential than if they approved of others' binge drinking. This ties in with the social identity theory where individuals strive to be a part of a group and adopt attitudes and behaviours that are consistent with the group identity. Often, a best friend would be a part of the same social group and hold similar attitudes and behaviours. This further highlights that the inclusion of group identity and complimentary normative measures such as descriptive norms were useful at least regarding binge drinking.

The findings of this research have provided a better understanding of binge drinking behaviours among young people. It has showed that many of the additions to the basic TPB model such as habit, measures of implicit arousal associations, group identity and self-identity can expand our understanding of undergraduates' binge drinking behaviours. These applications of an expanded TPB model provided very useful information in understanding binge drinking and implementing interventions that could be effective at reducing the amount of binge drinking. Some variance in predicting intentions and behaviour were left unexplained showing there is scope for future research to explore further variables in the decision making process to binge drink. Though the social identity interventions were unsuccessful, social identity played a key role in the decision making process. More research should be done into what identity associations might elicit significant changes in attitudes or other antecedents of decisions to binge drink through alternative interventions. As habit also played an important role as part of the expanded model, future research can be done to explore what methods might be effective at interrupting automatic processes as part of behavioural interventions. Using drink diaries to interrupt automatic drinking behaviours or social identity and health campaigns to alter identity association could possibly lead to a decrease in risky drinking levels for undergraduates.

9 Bibliography

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10 Appendices

- Appendix A – Study 1 Flyer

**ALCOHOL
STUDY**

To take part in a study about drinking alcohol please go to:

.....link.....

You could be entered to win a £100 Amazon voucher by completing 2 questionnaires 1 week apart

For more information about the study visit:

.....link.....

Or contact Gregory Howard at
(Gregory.Howard@uea.ac.uk)

One prize of £100 of Amazon vouchers
A random prize draw will take place on:
1st May, 2013
Odds approx. (1:250)

○ **Appendix B - Study 1 Time 1 Questionnaire**

Study 1 Questionnaire Time 1

I am carrying out this study as a part of my PhD thesis and the information may appear in academic publications.

You must be at least 18 and an undergraduate at a UK university to take part.

You are not required in any way to take part in this study and all information will be kept confidential.

Participation will involve the completion of 2 questionnaires 1 week apart.

The first questionnaire will take approximately 30 minutes.

The second questionnaire will take approximately 5 minutes.

If you complete BOTH questionnaires 1 week apart, you can be entered into a random prize draw to win a single £100 Amazon voucher by providing your email address following the completion of the second questionnaire. You must complete the first questionnaire and provide an email in order to receive the link for the second questionnaire.

The random prize draw for the £100 Amazon voucher will take place on 1st May 2013. The approximate chance of winning is 1:250.

All data will be password protected and kept securely in a locked filing cabinet in a limited access room on the UEA campus. Any identifying data will be kept separate from your responses and destroyed after the prize draw.

You will be asked for a few personal details, about your alcohol consumption and the alcohol consumption of others in your life.

If there are any questions you do not wish to answer, you may skip them and move on to the next question. This will not disqualify you from being entered into the prize draw.

You may withdraw from the study at any time by closing the window and exiting the questionnaire.

Your data will only be used and counted as a completed questionnaire if you select the 'submit' button at the end of the questionnaire.

If you chose to withdraw after you have selected to submit, you can still do so up until the 19th of April, 2013 by emailing me (Gregory.howard@uea.ac.uk).

If you have any other questions or concerns, you can contact me by email (Gregory.howard@uea.ac.uk) or Victoria Scaife (v.scaife@uea.ac.uk), Charlie Seger (c.seger@uea.ac.uk) or the head of school Kenny Coventry (k.coventry@uea.ac.uk).

If you do not want to take part in this study, you can exit this screen. If you would like to take part, are over 18 and an undergraduate at a UK university, please click 'next' to begin the questionnaire.

If you would like advice about alcohol and safe drinking guidelines you can visit these sites:

- DrinkAware: www.drinkaware.co.uk
- Talk to Frank: www.talktofrank.com/drug/alcohol
- The student advice centre at Union House (or your university)

If you are worried about your own or another's drinking behaviour you can contact:

- The Matthew Project: 0800 764754
- Drinkline: 08009178282
- www.nhs.uk/conditions/alcohol-misuse
- your GP
- The UEA counselling service at 01603 592651 or csr@uea.ac.uk

This questionnaire asks about binge drinking. Binge drinking is defined as consumption of 4 alcoholic drinks for women, or 5 alcoholic drinks for men, in a single drinking session.

Below is a guide to the number of alcohol units contained in common alcoholic drinks:

- A pint of ordinary lager (Carling Black Label, Fosters) = 2 Units
- A pint of strong lager (Stella Artois, Kronenbourg 1664) = 3 Units
- A pint of bitter (John Smith's, Boddingtons) = 2 Units
- A pint of ordinary strength cider (Strongbow, Dry Blackthorn) = 2 Units
- A 175ml glass of red/white wine = 2 Units
- A shot, pub measure of spirits (includes mixed drinks, e.g. whisky cola) = 1 Unit
- An alcopop (Smirnoff Ice, Bacardi Breezer, WKD, Reef) = 1.5

Now, using the above description of binge drinking as a reference, please respond to each of the statements below.

Your initials?

What is your age?

Gender: Female/Male/Other(please specify)

Do you currently attend university? Y/N

School of study

These questions generally have a ranking from 1 to 7. Please select the one that best represents your choice. If a question has a blank, please fill in your answer.

(1) I intend to binge drink in the next week

unlikely 2 3 4 5 6 likely

(2) I plan to binge drink in the next week

definitely no 2 3 4 5 6 definitely yes

(3) I would like to binge drink in the next week

definitely no 2 3 4 5 6 definitely yes

(4) I expect I will binge drink in the next week

unlikely 2 3 4 5 6 likely

(5) I want to binge drink in the next week

definitely no 2 3 4 5 6 definitely yes

(6) How likely is it that you will binge drink in the next week?

unlikely 2 3 4 5 6 likely

(7) Do you plan to drink less than 4/5 alcoholic drinks in a single session in the next week?

definitely no 2 3 4 5 6 definitely yes

(8) Will you try to drink less than 4/5 alcoholic drinks in a single session in the next week?

definitely no 2 3 4 5 6 definitely yes

(9) In the next week, do you intend to stop drinking before you are drunk?

definitely no 2 3 4 5 6 definitely yes

(10) My binge drinking during the next week would be...

Bad 2 3 4 5 6 Good

(11) My binge drinking during the next week would be...

Harmful 2 3 4 5 6 Beneficial

(12) My binge drinking during the next week would be...

Unpleasant 2 3 4 5 6 Pleasant

(13) My binge drinking during the next week would be...

Unenjoyable 2 3 4 5 6 Enjoyable

(14) My binge drinking during the next week would be...

Foolish 2 3 4 5 6 Wise

(15) How does the person you consider to be your best friend feel about you drinking alcohol?

Strongly disapproves 2 3 5 6 Strongly approves

(16) How important is your best friend's opinion to you?

Not at all important 2 3 4 5 6 very important

(17) How often does your best friend have at least one drink of alcohol in a week?

Never 2 3 4 5 6 very often

(18) How often does your best friend binge drink in a week?

Never 2 3 4 5 6 very often

(19) Most people who are important to me think I...

Should not binge drink in the next week 2 3 4 5 6 should binge drink in the next week

(20) The people in my life whose opinion I value would...

Disapprove of me binge drinking in the next week 2 3 4 5 6 approve of me binge drinking

(21) The people in my life whose opinion I value are...

Unlikely to binge drink in the next week 2 3 4 5 6 likely to binge drink in the next week

(22) Most people who are important to me will drink less than 5 alcoholic drink in a single session in the next week

Unlikely 2 3 4 5 6 likely

(23) How difficult/easy would you find it NOT to drink alcohol when friends are drinking in the next week?

Difficult 2 3 4 5 6 easy

(24) How difficult/easy would you find it to refuse a drink when offered by friends?

Difficult 2 3 4 5 6 easy

(25) How difficult/easy would you find it to explain to other people that you do not want to drink?

Difficult 2 3 4 5 6 easy

(26) I feel under social pressure to binge drink in the next week

Strongly disagree 2 3 4 5 6 strongly agree

(27) With regards to you binge drinking, how much do you want to do what your friends think you should?

Not at all 2 3 4 5 6 very much

(28) Whether I do or do not binge drink in the next week is entirely up to me

Strongly disagree 2 3 4 5 6 strongly agree

(29) How much control do you feel you have over binge drinking in the next week?

No control 2 3 4 5 6 complete control

(30) I would like to binge drink in the next week but I don't really know if I can

Strongly disagree 2 3 4 5 6 strongly agree

(31) I am confident that I could binge drink in the next week if I wanted to

Strongly disagree 2 3 4 5 6 strongly agree

(32) Binge drinking is something I do frequently

Disagree 2 3 4 5 6 agree

(33) Binge drinking is something I do automatically

Disagree 2 3 4 5 6 agree

(34) Binge drinking is something I do without having to consciously remember

Disagree 2 3 4 5 6 agree

(35) Binge drinking is something that makes me feel weird if I do not do it

Disagree 2 3 4 5 6 agree

(36) Binge drinking is something I do without thinking

Disagree 2 3 4 5 6 agree

(37) Binge drinking is something that would require effort not to do it

Disagree 2 3 4 5 6 agree

(38) Binge drinking is something that belongs to my weekly routine

Disagree 2 3 4 5 6 agree

(39) Binge drinking is something that belongs to my weekly routine

Disagree 2 3 4 5 6 agree

(40) Binge drinking is something I start doing without realising I'm doing it

Disagree 2 3 4 5 6 agree

(41) Binge drinking is something I would find hard not to do

Disagree 2 3 4 5 6 agree

(42) Binge drinking is something I have no need to think about doing

Disagree 2 3 4 5 6 agree

(43) Binge drinking is something that is typically 'me'

Disagree 2 3 4 5 6 agree

(44) Binge drinking is something I have been doing for a long time

Disagree 2 3 4 5 6 agree

(45) I have a reserved and cautious attitude toward life

Strongly disagree 2 3 4 5 6 strongly agree

(46) My thinking is usually careful and purposeful

Strongly disagree 2 3 4 5 6 strongly agree

(47) I am not one of those people who blurt out things without thinking

Strongly disagree 2 3 4 5 6 strongly agree

(48) I like to stop and think things over before I do them

Strongly disagree 2 3 4 5 6 strongly agree

(49) I don't like to start a project until I know exactly how to proceed

Strongly disagree 2 3 4 5 6 strongly agree

(50) I tend to value and follow a rational, "sensible" approach to things

Strongly disagree 2 3 4 5 6 strongly agree

(51) I usually make up my mind through careful reasoning

Strongly disagree 2 3 4 5 6 strongly agree

(52) I am a cautious person

Strongly disagree 2 3 4 5 6 strongly agree

(53) Before I get into a new situation I like to find out what to expect from it

Strongly disagree 2 3 4 5 6 strongly agree

(54) I usually think carefully before doing anything

Strongly disagree 2 3 4 5 6 strongly agree

(55) Before making up my mind, I consider all the advantages and disadvantages

Strongly disagree 2 3 4 5 6 strongly agree

(56) I have trouble controlling my impulses

Strongly disagree 2 3 4 5 6 strongly agree

(57) I have trouble resisting my cravings for alcohol

Strongly disagree 2 3 4 5 6 strongly agree

(58) I often get involved in things I later wish I could get out of

Strongly disagree 2 3 4 5 6 strongly agree

(59) When I feel bad, I will often do things I later regret in order to make myself feel better now

Strongly disagree 2 3 4 5 6 strongly agree

(60) Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse

Strongly disagree 2 3 4 5 6 strongly agree

(61) When I am upset I often act without thinking

Strongly disagree 2 3 4 5 6 strongly agree

(62) When I feel rejected, I will often say things that I later regret

Strongly disagree 2 3 4 5 6 strongly agree

(63) It is hard for me to resist acting on my feelings

Strongly disagree 2 3 4 5 6 strongly agree

(64) I often make matters worse because I act without thinking when I am upset

Strongly disagree 2 3 4 5 6 strongly agree

(65) In the heat of an argument, I will often say things that I later regret

Strongly disagree 2 3 4 5 6 strongly agree

(66) I am always able to keep my feelings under control.

Strongly disagree 2 3 4 5 6 strongly agree

(67) Sometimes I do things on impulse that I later regret

Strongly disagree 2 3 4 5 6 strongly agree

(68) I generally seek new and exciting experiences and sensations

Strongly disagree 2 3 4 5 6 strongly agree

(69) I'll try anything once

Strongly disagree 2 3 4 5 6 strongly agree

(70) I like sports and games in which you have to choose your next move very quickly

Strongly disagree 2 3 4 5 6 strongly agree

(71) I would enjoy water skiing

Strongly disagree 2 3 4 5 6 strongly agree

(72) I quite enjoy taking risks

Strongly disagree 2 3 4 5 6 strongly agree

(73) I would enjoy parachute jumping

Strongly disagree 2 3 4 5 6 strongly agree

(74) I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional

Strongly disagree 2 3 4 5 6 strongly agree

(75) I would like to learn to fly an airplane

Strongly disagree 2 3 4 5 6 strongly agree

(76) I sometimes like doing things that are a bit frightening

Strongly disagree 2 3 4 5 6 strongly agree

(77) I would enjoy the sensation of skiing very fast down a high mountain slope

Strongly disagree 2 3 4 5 6 strongly agree

(78) I would like to go scuba diving

Strongly disagree 2 3 4 5 6 strongly agree

(79) I would enjoy fast driving

Strongly disagree 2 3 4 5 6 strongly agree

(80) I generally like to see things through to the end

Strongly disagree 2 3 4 5 6 strongly agree

(81) I tend to give up easily

Strongly disagree 2 3 4 5 6 strongly agree

(82) Unfinished tasks really bother me

Strongly disagree 2 3 4 5 6 strongly agree

(83) Once I get going on something I hate to stop

Strongly disagree 2 3 4 5 6 strongly agree

(84) I concentrate easily

Strongly disagree 2 3 4 5 6 strongly agree

(85) I finish what I start

Strongly disagree 2 3 4 5 6 strongly agree

(86) I'm pretty good about pacing myself so as to get things done on time

Strongly disagree 2 3 4 5 6 strongly agree

(87) I am a productive person who always gets the job done

Strongly disagree 2 3 4 5 6 strongly agree

(88) Once I start a project, I almost always finish it

Strongly disagree 2 3 4 5 6 strongly agree

(89) There are so many little jobs that need to be done that I sometimes just ignore them all

Strongly disagree 2 3 4 5 6 strongly agree

(90) I feel that I fit well with UEA students

Strongly disagree 2 3 4 5 6 strongly agree

(91) I am a similar kind of person to other UEA students

Strongly disagree 2 3 4 5 6 strongly agree

(92) I feel like I belong as a UEA students

Strongly disagree 2 3 4 5 6 strongly agree

(93) It is important to me that I belong as a UEA students

Strongly disagree 2 3 4 5 6 strongly agree

(94) Being a student is a social activity that I enjoy sharing with other UEA students

Strongly disagree 2 3 4 5 6 strongly agree

(95) When I am with other UEA students we often talk about being a student

Strongly disagree 2 3 4 5 6 strongly agree

(96) Drinking more than 4/5 alcoholic drinks in a single session in the next week is an important part of who I am

Strongly disagree 2 3 4 5 6 strongly agree

(97) I think of myself as the type of person who would drink more than 4/5 alcoholic drinks in a single session in the week

Strongly disagree 2 3 4 5 6 strongly agree

(98) Think about other UEA students. How much would they agree that drinking five or more standard alcoholic beverages in a single session in the next week is a good thing to do?

Completely 2 3 4 5 6 Not at all

(99) How many UEA students would think that drinking five or more standard alcoholic beverages in a single session in the next week is a good thing to do?

None 2 3 4 5 6 All

(100) How many UEA students would drink five or more standard alcoholic beverages in a single session in the next week?

None 2 3 4 5 6 All

(101) Think about other UEA students. What percentage of them do you think would drink five or more standard alcoholic beverages in a single session in the next week?

0% 2 3 4 5 6 100%

(102) How much do you feel you identify with other UEA students?

Not very much 2 3 4 5 6 Very Much

(103) With respect to your general attitudes and beliefs, how similar do you feel you are to other UEA students?

Very dissimilar 2 3 4 5 6 Very Similar

(104) Think about who you are. How important is being a UEA student?

Very important 2 3 4 5 6 Very unimportant

(105) How much do you feel strong ties with other UEA students?

Very much 2 3 4 5 6 Not very much

(106) In general, how well do you feel you fit in with other UEA students?

Not very well 2 3 4 5 6 Very well

(107) How much do you see yourself belonging with other UEA students?

Not very much 2 3 4 5 6 Very much

(108) Is drinking alcohol something university students do often?

Not at all 2 3 4 5 6 Very much

(109) How often do university students drink alcohol?

Not often 2 3 4 5 6 Very often

(110) I drink alcohol because I am a university student...

Not at all 2 3 4 5 6 Very much

(111) University students drink alcohol

Definitely no 2 3 4 5 6 Definitely yes

(112) University students are expected to drink alcohol

Not at all 2 3 4 5 6 Very much

(113) Do most university students binge drink?

Definitely no 2 3 4 5 6 Definitely yes

(114) How much pressure do you feel to drink alcohol because you are a university student?

Not at all 2 3 4 5 6 Very much

(115) How much is binge drinking part of the university experience?

Not at all 2 3 4 5 6 Very much

(116) On average how much do you drink on a night out?

None/1 drink or less/2 drinks/3 drinks/4 drink/5 drinks/more than 5 drinks

Please provide an email address so that you may be provided with the second questionnaire's link to complete in one week's time:

Many thanks for completing the questionnaire.

In order to be entered into the prize draw for the £100 Amazon voucher, you must complete the second questionnaire and provide your email address in one week's time.

You must supply your email address below in order to receive the link to the second questionnaire. If you supply your email address below, you will be sent a reminder email within the week with the link for the second questionnaire.

All data will be password protected and kept securely in a locked filing cabinet in a limited access room on the UEA campus. Any identifying data will be kept separate from your responses and destroyed after the prize draw.

The random prize draw for the £100 Amazon voucher will take place on 1st May 2013. The approximate chance of winning is 1:250.

If you have any questions or concerns regarding the study please contact me (Gregory.howard@uea.ac.uk), Victoria Scaife (v.scaife@uea.ac.uk), Charlie Seger (c.seger@uea.ac.uk) or Kenny Coventry (k.coventry@uea.ac.uk).

If you would like to withdraw your data after submitting you can do so up until the 19th April, 2013 by contacting me (Gregory.howard@uea.ac.uk)

If you would like advice about alcohol and safe drinking guidelines you can visit these sites:

- DrinkAware: www.drinkaware.co.uk
- Talk to Frank: www.talktofrank.com/drug/alcohol
- The student advice centre at Union House (or your university)

If you are worried about your own or another's drinking behaviour you can contact:

- The Matthew Project: 0800 764754
- Drinkline: 08009178282
- www.nhs.uk/conditions/alcohol-misuse
- your GP
- The UEA counselling service at 01603 592651 or csr@uea.ac.uk

○ **Appendix C - Study 1 Time 2 Questionnaire**

I am carrying out this study as a part of my PhD thesis and the information may appear in academic publications.

You must be at least 18 and an undergraduate at a UK university to take part.

You are not required in any way to take part in this study and all information will be kept confidential.

Participation will involve the completion of 2 questionnaires 1 week apart.

The first questionnaire will take approximately 30 minutes.

The second questionnaire will take approximately 5 minutes.

If you complete BOTH questionnaires 1 week apart, you can be entered into a random prize draw to win a single £100 Amazon voucher by providing your email address following the completion of the second questionnaire. You must complete the first questionnaire and provide an email in order to receive the link for the second questionnaire.

The random prize draw for the £100 Amazon voucher will take place on 1st May 2013. The approximate chance of winning is 1:250.

All data will be password protected and kept securely in a locked filing cabinet in a limited access room on the UEA campus. Any identifying data will be kept separate from your responses and destroyed after the prize draw.

You will be asked for a few personal details, about your alcohol consumption and the alcohol consumption of others in your life.

If there are any questions you do not wish to answer, you may skip them and move on to the next question. This will not disqualify you from being entered into the prize draw.

You may withdraw from the study at any time by closing the window and exiting the questionnaire.

Your data will only be used and counted as a completed questionnaire if you select the 'submit' button at the end of the questionnaire.

(2) I regularly participated in binge drinking in the last week

Definitely no 2 3 4 5 6 definitely yes

(3) I drank frequently in the last week

Definitely no 2 3 4 5 6 definitely yes

(4) I drank alcohol in the last week but not more than 4/5 alcoholic drinks in a single session

Definitely no 2 3 4 5 6 definitely yes

(5) In the last week, I stopped drinking before I was drunk

Definitely no 2 3 4 5 6 definitely yes

(6) How many times did you engage in binge drinking in the last week?

(7) On how many days in the past week did you participate in binge drinking?

1 2 3 4 5 6 7 n/a

Email address for entry into the prize draw for a £100 Amazon voucher:

Many thanks for completing the questionnaire. In order to be entered into the prize draw for a £100 Amazon voucher, please enter your email address. Many thanks for completing the questionnaire.

In order to be entered into the prize draw for a £100 Amazon voucher, please enter your email address.

○ Appendix D - Statistics for Measures in Study 1

Statistics

		Behaviour	Intentions	Attitudes	Subjective Norms	PBC	Habit	Impulse premeditation	Impulsivity urgency	Impulsivity sensation seeking	Impulsivity perseverance	UEA Identification	Group Norms	Self-identity	Descriptive Norms
N	Valid	156	216	217	221	228	217	221	222	219	220	219	215	226	227
	Missing	73	13	12	8	1	12	8	7	10	9	10	14	3	2
Mean		2.7271	3.7186	3.3806	4.0075	6.1711	2.8806	4.69	3.43	4.41	4.73	4.6020	5.4547	2.7810	4.5463
Std. Error of Mean		.11916	.12336	.09731	.08421	.07995	.10735	.082	.088	.096	.069	.08080	.05340	.11340	.11241
Median		2.4286	3.6111	3.8000	4.0000	7.0000	2.5833	4.64	3.33	4.42	4.80	4.6923	5.5000	2.5000	4.5000
Mode		1.57	1.00	1.00	4.33	7.00	1.00	4	4	4 ^a	5 ^a	4.85	5.92	1.00	5.00
Std. Deviation		1.48837	1.81302	1.43353	1.25184	1.20723	1.58129	1.225	1.309	1.415	1.028	1.19575	.78301	1.70478	1.69364
Variance		2.215	3.287	2.055	1.567	1.457	2.500	1.501	1.712	2.002	1.057	1.430	.613	2.906	2.868
Skewness		.405	.135	-.255	-.011	-1.559	.534	-.280	.423	-.146	-.381	-.489	-.294	.637	-.339
Std. Error of		.194	.166	.165	.164	.161	.165	.164	.163	.164	.164	.164	.166	.162	.162
Kurtosis		-.825	-1.193	-.678	.078	1.604	-.808	-.273	-.529	-.698	-.007	-.063	-.355	-.614	-.848
Std. Error of Kurtosis		.386	.330	.329	.326	.321	.329	.326	.325	.327	.327	.327	.330	.322	.322
Range		5.86	6.00	6.00	6.00	5.50	5.75	6	6	6	6	5.77	3.75	6.00	6.00
Minimum		.71	1.00	1.00	1.00	1.50	1.00	1	1	1	2	1.08	3.25	1.00	1.00
Maximum		6.57	7.00	7.00	7.00	7.00	6.75	7	7	7	7	6.85	7.00	7.00	7.00
Percentiles	25	1.5714	2.1389	2.4000	3.0000	6.0000	1.4583	3.95	2.42	3.50	4.10	4.0000	4.9167	1.0000	3.0000
	50	2.4286	3.6111	3.8000	4.0000	7.0000	2.5833	4.64	3.33	4.42	4.80	4.6923	5.5000	2.5000	4.5000
	75	4.0000	5.2222	4.4000	4.6667	7.0000	4.2500	5.55	4.25	5.42	5.48	5.5385	6.0000	4.0000	6.0000

a. Multiple modes exist. The smallest value is shown

○ Appendix E – Study 2 Flyer

UEA **Attitudes Study** **UEA**
University of East Anglia University of East Anglia

A chance to win £250

If you are an undergrad and would like to take part in a study about attitudes please email me at:

Gregory.Howard@uea.ac.uk

You could be entered to win a £250 Amazon Voucher

Participants will attend a lab session and complete tasks on a computer at UEA followed 1 week later by a short online questionnaire

Please email for more information about the study.

One prize of £250 of Amazon vouchers
Prize draw will take place on: 1 Feb 2014
Odds approx. (1:200)

○ **Appendix F – Study 2 Briefing Sheet**

I am carrying out this study as a part of my PhD thesis and the outcomes of the study may appear in academic publications.

You must be at least 18 to take part.

You are not required in any way to take part in this study and all information will be kept confidential.

Participation will involve taking part in an experiment including an assessment of a brief piece of informational writing and 2 questionnaires 1 week apart. I am interested in people's responses to various writing styles and attitudes towards certain behaviours.

The first portion of the experiment will take approximately 30 minutes.

The second online questionnaire at the one week follow-up will take approximately 5 minutes.

If you complete BOTH parts of the experiment 1 week apart, you can be entered into a random prize draw to win a single £250 Amazon voucher by filling out the prize draw entry form following the completion of the second questionnaire.

You must provide an email at the lab session in order to receive the link for the second questionnaire.

You will be asked for a few personal details (such as age) and opinions.

All data will be password protected and kept securely in a locked filing cabinet in a limited access room on the UEA campus.

You may withdraw from the study at any time by exiting the study.

If you chose to withdraw after you have completed, you can still do so up until the 31st of Jan, 2014 by emailing me (Gregory.howard@uea.ac.uk).

If you have any other questions or concerns, you can contact me by email (Gregory.howard@uea.ac.uk) or Victoria Scaife (v.scaife@uea.ac.uk), Charlie Seger (c.seger@uea.ac.uk) or the head of school Kenny Coventry (k.coventry@uea.ac.uk).

○ **Appendix G – Study 2 Consent Form**

School of Psychology

Consent Form

Attitudes Study

Name of Researcher: Gregory M Howard



Please initial all boxes

1. I have read and understand the information sheet (Briefing Sheet) and had the opportunity to ask questions and have these answered satisfactorily.

2. My participation is voluntary and I know that I am free to withdraw at any time, without giving any reason and without it affecting me at all

3. I know that no personal information (such as my name) will be shared outside of the research team or published in the final report(s) from this research

4. I agree to take part in the above study

Participant's signature.....Date.....

Researcher Contact details:

Gregory.Howard@uea.ac.uk

Do also contact us if you have any worries or concerns about this research.

School of Psychology Ethics Committee:

ethics.psychology@uea.ac.uk; Phone 01603 597146

Head of School Professor Kenny Coventry:

k.coventry@uea.ac.uk; Phone 01603 597145

○ **Appendix H – Study 2 Debriefing Sheets**

Debriefing Sheet – Time 1 Manipulation 2

Many thanks for completing the questionnaire.

In order to be entered into the prize draw, you must complete the second questionnaire and prize draw form in one week's time.

All data will be password protected and kept securely in a locked filing cabinet in a limited access room on the UEA campus.

If you supplied your email address, you will be sent a reminder email within the week with the link for the second questionnaire.

If you have any questions or concerns regarding the study please contact me (Gregory.howard@uea.ac.uk), Victoria Scaife (v.scaife@uea.ac.uk), Charlie Seger (c.seger@uea.ac.uk) or Kenny Coventry (k.coventry@uea.ac.uk).

If you would like to withdraw your data after submitting you can do so up until the 31st Jan, 2014 by contacting me (Gregory.howard@uea.ac.uk)

If you would like advice about alcohol and safe drinking guidelines you can visit these sites:

- DrinkAware: www.drinkaware.co.uk
- Talk to Frank: www.talktofrank.com/drug/alcohol
- The student advice centre at Union House (or your university)

If you are worried about your own or another's drinking behaviour you can contact:

- The Matthew Project: 0800 764754
- Drinkline: 08009178282
- www.nhs.uk/conditions/alcohol-misuse
- Dean of Students
- your GP
- The UEA counselling service at 01603 592651 or csr@uea.ac.uk

Debriefing Sheet – Time 1 Manipulation 1

Many thanks for completing the questionnaire.

The information regarding UEA undergrads in the first portion of the experiment stating:

“A recent survey of campus drinking habits found that UEA undergrads are by far the largest consumers of alcoholic drinks. While drinking among all groups could be lower, the survey found that the average UEA undergrad consumes almost two times the amount of alcohol as the average person at outside uni,” was created for the purposes of this study only.

There was no recent survey or information to support a claim that UEA undergrads drink any more than any other person in regards to this study.

All data will be password protected and kept securely in a locked filing cabinet in a limited access room on the UEA campus.

If you have any questions or concerns regarding the study please contact me (Gregory.howard@uea.ac.uk), Victoria Scaife (v.scaife@uea.ac.uk), Charlie Seger (c.seger@uea.ac.uk) or Kenny Coventry (k.coventry@uea.ac.uk).

If you would like to withdraw your data after submitting you can do so up until the 31st Jan, 2014 by contacting me (Gregory.howard@uea.ac.uk)

If you would like advice about alcohol and safe drinking guidelines you can visit these sites:

- DrinkAware: www.drinkaware.co.uk
- Talk to Frank: www.talktofrank.com/drug/alcohol
- The student advice centre at Union House (or your university)

If you are worried about your own or another’s drinking behaviour you can contact:

- The Matthew Project: 0800 764754
- Drinkline: 08009178282
- www.nhs.uk/conditions/alcohol-misuse
- Dean of Students
- your GP
- The UEA counselling service at 01603 592651 or csr@uea.ac.uk

Debriefing Sheet Time 2 – Manipulation 2

Many thanks for completing the questionnaire.

The information regarding Essex University undergrads in the first portion of the experiment stating “A recent survey of campus drinking habits found that Essex University undergrads are by far the largest consumers of alcoholic drinks. While drinking among all groups could be lower, the survey found that the average Essex Uni undergrad consumes almost two times the amount of alcohol as the average person at UEA,” was created for the purposes of this study only.

There was no recent survey or information to support a claim that Essex University undergrads drink any more than any other person in regards to this study.

In order to be entered into the prize draw, please complete the prize draw form on the next sheet.

All data will be password protected and kept securely in a locked filing cabinet in a limited access room on the UEA campus.

If you have any questions or concerns regarding the study please contact me (Gregory.howard@uea.ac.uk), Victoria Scaife (v.scaife@uea.ac.uk), Charlie Seger (c.seger@uea.ac.uk) or Kenny Coventry (k.coventry@uea.ac.uk).

If you would like to withdraw your data after submitting you can do so up until the 1st Jan, 2014 by contacting me (Gregory.howard@uea.ac.uk)

If you would like advice about alcohol and safe drinking guidelines you can visit these sites:

- DrinkAware: www.drinkaware.co.uk
- Talk to Frank: www.talktofrank.com/drug/alcohol
- The student advice centre at Union House (or your university)

If you are worried about your own or another’s drinking behaviour you can contact:

- The Matthew Project: 0800 764754
- Drinkline: 08009178282
- www.nhs.uk/conditions/alcohol-misuse
- Dean of Students
- your GP
- The UEA counselling service at 01603 592651 or csr@uea.ac.uk

Debriefing Sheet Time 2 - Control

Many thanks for completing the questionnaire.

In order to be entered into the prize draw, please complete the prize draw form on the next sheet.

All data will be password protected and kept securely in a locked filing cabinet in a limited access room on the UEA campus.

If you have any questions or concerns regarding the study please contact me (Gregory.howard@uea.ac.uk), Victoria Scaife (v.scaife@uea.ac.uk), Charlie Seger (c.seger@uea.ac.uk) or Kenny Coventry (k.coventry@uea.ac.uk).

If you would like to withdraw your data after submitting you can do so up until the 1st Jan, 2014 by contacting me (Gregory.howard@uea.ac.uk)

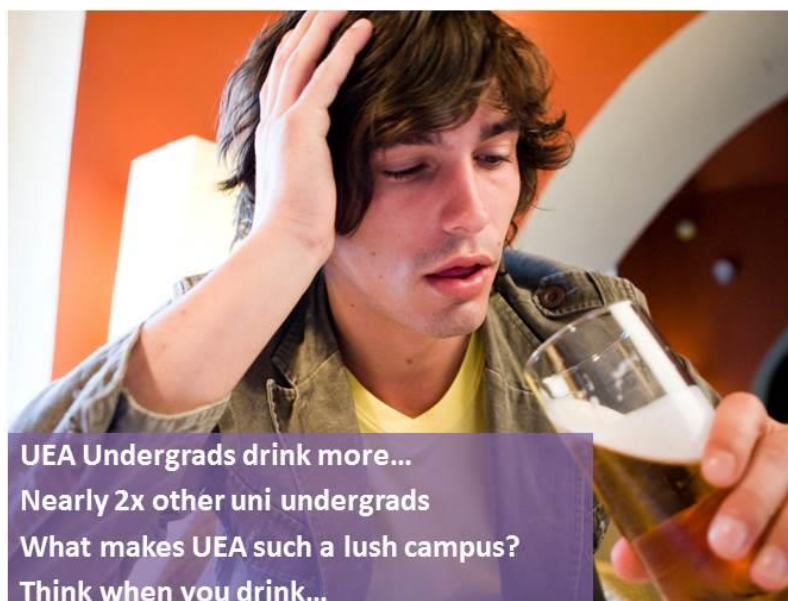
If you would like advice about alcohol and safe drinking guidelines you can visit these sites:

- DrinkAware: www.drinkaware.co.uk
- Talk to Frank: www.talktofrank.com/drug/alcohol
- The student advice centre at Union House (or your university)

If you are worried about your own or another's drinking behaviour you can contact:

- The Matthew Project: 0800 764754
- Drinkline: 08009178282
- www.nhs.uk/conditions/alcohol-misuse
- Dean of Students
- your GP
- The UEA counselling service at 01603 592651 or csr@uea.ac.uk

○ **Appendix I – Study 2 Articles**



A recent survey of drinking habits found that UEA undergraduate students are by far the largest consumers of alcoholic drinks. While drinking among all groups could be lower, the survey found that the average UEA undergrad consumes almost two times the amount of alcohol as the average person outside uni.



Underemployment continues to be a problem for the UK labour market making further predictions about the economy uncertain. It can be said with some certainty that underemployment will have some permanent damage in the labour market as productivity collapses and economic potential output goes unrealised. Concerns about the economy suggest that early 2013's economic growth will not be easily sustained.

Poaching for ivory could lead to the extinction of Elephants



A report released earlier this year showed elephant poaching is at its highest it in two decades. It is thought that over half of Africa's elephant population has been wiped out by poachers. Because of this, an international ban on the ivory trade was enacted leading to an increase in public awareness of the threat of extinction posed by the ivory trade. Consequently, demand for ivory has decreased.



Lots of (avoidance group) at UEA drink...
and lots of them are sketchy.
So think when you drink...
Nobody wants to be mistaken for this guy.

A recent survey of campus drinking habits found that (avoidance group) are by far the largest consumers of alcoholic drinks on campus. While drinking among all campus groups could be lower, the survey found that the average (avoidance group) consumes almost two times the amount of alcohol as the average person on campus.

○ Appendix J – Study 3 Flyer

UEA
University of East Anglia

Alcohol Study

UEA
University of East Anglia

Win £20

If you are an undergrad at UEA and would like to take part in a study about alcohol please email me at:

Gregory.Howard@uea.ac.uk

You could win 1 of 15, £20 Amazon vouchers

Participants will complete a 30 minute online questionnaire followed 1 week later by a short 5 minute online questionnaire

Please email for more information about the study.

15 prizes of £20 Amazon vouchers
Prize draw will take place on: 31 Mar 2015
Odds approx. (1:20)

- **Appendix K – Study 3 E-bulletin Newsletter**

PSY Alcohol Research

Take part in a PSY study about alcohol and enter a prize draw to win Amazon vouchers worth £20

Gregory Howard, a PhD researcher, is looking for UEA students to take part in a study about alcohol.

Volunteers will be asked to complete 2 questionnaires 1 week apart. The first questionnaire takes approximately 30 minutes and the second, less than 5 minutes.

Volunteers completing both questionnaires 1 week apart will be entered into a prize draw for 1 of 15 £20 Amazon vouchers.

The link for the first questionnaire is:

https://ueapsych.eu.qualtrics.com/SE/?SID=SV_2norCYfMq81tLVj

For more information, please contact Gregory Howard at Gregory.howard@uea.ac.uk

○ **Appendix L – Study 3 Time 2 Briefing Sheet**

You should have already completed the first questionnaire one week ago before beginning this questionnaire. If you have not done so, you can by going to:.....

I am carrying out this study as a part of my PhD thesis and the information may appear in academic publications.

You must be at least 18 and an undergraduate at UEA to take part.

You are not required in any way to take part in this study and all information will be kept confidential.

This second questionnaire will take approximately 5 minutes.

If you complete BOTH questionnaires 1 week apart, you can be entered into a random prize draw to win 1 of 15, £20 Amazon voucher by filling out the prize draw entry form following the completion of the second questionnaire. You must have completed the first questionnaire and provided an email in order to receive the link for the second questionnaire.

You will be asked for a few personal details and about your alcohol consumption.

All data will be password protected and kept securely in a locked filing cabinet in a limited access room on the UEA campus.

If there are any questions you do not wish to answer, you may skip them and move on to the next question. This will not disqualify you from being entered into the prize draw.

It is advised that you do not take part if you are receiving treatment for alcohol use or are concerned about your drinking behaviour.

You may withdraw from the study at any time by closing the window and exiting the questionnaire.

Your data will only be used and counted as a completed questionnaire if you select the 'submit' button at the end of the questionnaire.

If you chose to withdraw after you have selected to submit, you can still do so up until the 15th of April, 2015 by emailing me (Gregory.howard@uea.ac.uk).

If you have any other questions or concerns, you can contact me by email (Gregory.howard@uea.ac.uk) or Victoria Scaife (v.scaife@uea.ac.uk), Charlie Seger (c.seger@uea.ac.uk) or the head of school Kenny Coventry (k.coventry@uea.ac.uk).

If you do not want to take part in this study, you may exit this screen. If you would like to take part, are over 18 and an undergraduate at a UK university, please click 'continue' to begin the questionnaire.

○ **Appendix M – Study 3 Time 2 Questionnaire**

SECTION A

Please provide the following information about yourself

Age in years:

Gender:

SECTION B

Now please read the following information:

This questionnaire asks about binge drinking. Binge drinking is defined as consumption of 4 alcoholic drinks for women and 5 for men, in a single drinking session.

Below is a guide to the number of alcohol units contained in common alcoholic drinks:

- A pint of ordinary lager (Carling Black Label, Fosters) = 2 Units
- A pint of strong lager (Stella Artois, Kronenbourg 1664) = 3 Units
- A pint of bitter (John Smith's, Boddingtons) = 2 Units
- A pint of ordinary strength cider (Strongbow, Dry Blackthorn) = 2 Units
- A 175ml glass of red/white wine = 2 Units
- A shot, pub measure of spirits (includes mixed drinks, e.g. whisky cola) = 1 Unit
- An alcopop (Smirnoff Ice, Bacardi Breezer, WKD, Reef) = 1.5 Units

Now, using the above description of binge drinking as a reference, please respond to each of the statements below by selecting the number that best reflects what you think. Do so for only one number per statement.

(1) I participated in a binge drinking session in the last week

definitely no 1 2 3 4 5 6 7 definitely yes

(2) I regularly participated in binge drinking in the last week

definitely no 1 2 3 4 5 6 7 definitely yes

(3) I drank frequently in the last week

definitely no 1 2 3 4 5 6 7 definitely yes

(4) I drank alcohol in the last week but not more than 7/10 units in a single session definitely no

1 2 3 4 5 6 7 definitely yes

(5) How many times did you engage in binge drinking in the last week?

(6) On how many days in the past week did you participate in binge drinking?

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE

If there is anything you want to say about binge drinking, alcohol in general or about this questionnaire you can write it in the box below or leave it blank.