UNDERSTANDING THE ROLE OF SOCIAL NORMS IN A WEB-BASED PERSONALISED, FEEDBACK INTERVENTION FOR ALCOHOL USE

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The candidate confirms that the work submitted is his/her own and that appropriate credit has been given where reference has been made to the work of others

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ABSTRACT

Excessive alcohol consumption in university students in the UK has been identified by Government agencies and health care providers as significant problem. Social norms research suggests students evaluate and regulate their own alcohol consumption through social comparison with peers. However, students are prone to misperceptions, inaccurately estimating others' alcohol consumption to be higher than their own. The over estimation of normative peer alcohol consumption has been associated with higher personal alcohol consumption.

Unitcheck is an online alcohol resource available to university students in the UK (www.unitcheck.co.uk). Using a social norms approach this online alcohol intervention provides instant personalised normative feedback to students, directly comparing reported individual alcohol consumption with normative peer alcohol consumption. This comparison is designed to correct students' overestimation of normative peer drinking and encourage moderate alcohol consumption. Currently, Unitcheck feedback is labelled as comparing personal alcohol consumption to normative alcohol consumption of the typical University of Leeds student. There is a paucity of research exploring student responses to personalised normative feedback on an individual level.

The aim of this study was to evaluate how students reporting alcohol consumption above recommended weekly limits at the University of Leeds, respond to instant, online personalised normative feedback presented as part of a study version of Unitcheck. A between subjects experimental design employing qualitative think-aloud methodology, plus a semi-structured interview was used. Participants were 21 Undergraduate students in their first or second year of study at the University of Leeds, 67% female, mean age 19.3 years (range 18-21), mean

alcohol consumption over the previous week 38.4 units (range 10-150). Participants were randomised to one of two study groups and asked to work through the Unitcheck resource whilst thinking their thoughts aloud. Group A (n=11) used a same-sex referent group in the personalised normative feedback for University of Leeds students. Group B (n=10) used typical University of Leeds student as the normative referent group. All participants then completed a semi-structured interview assessing how believable and personally relevant they found the feedback.

Findings from thematic analysis of the transcripts suggest that personalised feedback prompts participants to actively consider their personal value judgements regarding acceptable drinking behaviour. Students responded directly to the normative feedback component. Justifications of ratings of believability of normative feedback were based on personal observations of student drinking behaviour and perceived credibility of the normative data. The current manipulation focussed on gender as a salient comparison group, participants suggested year of study and age as alternative salient normative comparison groups.

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ABBREVIATIONS

AUDIT: Alcohol Use Disorders Identification Test

DH: Department of Health

ESPAD: European School Survey Project on Alcohol and Other Drugs

ESSUS: European Symposium on Substance Use among Students

GLF: General Lifestyle Survey

HM Government: Her Majesty's Government

NICE: National Institute for Clinical Excellence

POST: Parliamentary Office of Science and Technology

UK: United Kingdom

USA: United States of America

INTRODUCTION

The following introduction reviews literature regarding: the definition and consequences of excessive alcohol consumption in the UK; student drinking behaviour; the social norms approach to alcohol intervention; delivery of social norm interventions and evidence of their effectiveness in reducing student alcohol misuse; the role of referent groups in social norm interventions and finally introduces Unitcheck, a Web-based personalised normative feedback intervention.

Problematic drinking: definition, impact and policy

In the United Kingdom (UK), sensible drinking guidelines from the Department of Health (DH) recommend that men should not drink more than 21 units of alcohol in a week, or more than 3-4 units in any one day. Women should not exceed 14 units of alcohol in a week, or more than 2-3 units in any one day (DH, 1995; British Medical Association, 1995). One standard unit equates to approximately 8g or 10ml of ethanol. It is also recommended that alcohol should not be consumed for 48 hours after an episode of heavy drinking (DH, 1995). Heavy episodic drinking, or binge drinking, has been defined as consuming 8 or more units of alcohol on one occasion for men and 6 or more units for women (British Medical Association, 2008). Problematic drinking has been defined in terms of increasing health risks. Guidelines from the National Institute for Clinical Excellence (NICE) define alcohol consumption of increasing risk, or potentially hazardous levels, as 22-50 units per week for men and 15-35 units per week for women (NICE, 2010). High risk, or potentially harmful, drinking is defined as 50 or more units per week for men and consuming 35 plus units per week for women (NICE, 2010).

Statistics on adult drinking behaviour in England indicate that a substantial minority of young people binge drink (The NHS Information Centre, 2010). Nearly a

quarter (24%) of men aged 16-24 years reported drinking more than 8 units of alcohol on at least one day in the previous week, similarly a quarter (24%) of women reported drinking over 6 units in a day (General Lifestyle Survey (GLF), 2009). For women, this figure exceeds those represented in the other age ranges (25 years +). It is also common for young people to exceed recommended weekly limits, with 21% of men and 23% of women in the 16-24 age range reporting doing so (GLF, 2009). Although, young people do not drink as frequently as adults in some of the older age ranges, it is the pattern of binge drinking in young adults and the associated negative consequences that have prompted concern from Government and health professionals in the UK (HM Government, 2007).

The consequences of drinking in excess of the recommended limits include significant acute and chronic health risks, as well as social and behavioural repercussions (Prime Minister's Strategy Unit, 2004). As alcohol consumption increases beyond recommended levels so does the risk of developing some forms of cancer, diabetes, cardiovascular diseases, some psychiatric disorders and cirrhosis of the liver (British Medical Association, 2008). Harmful drinkers in particular are at increased risk of experiencing hypertension, stroke, coronary heart disease, pancreatitis and liver disease (British Medical Association, 2008). Cognitive performance is also affected by alcohol consumption. Binge drinking in particular has been associated with impairment in frontal lobe function in students, specifically sustained attention, working memory and planning (Hartley, Elsabagh & File, 2004). Other significant alcohol related harms include acute injuries sustained whilst intoxicated, increased violence and anti social behaviour (Prime Minister's Strategy Unit, 2004). Death rates in the UK due to intoxication have doubled over the last 20

years and injuries sustained whilst intoxicated account for 29% of deaths attributable to alcohol (Parliamentary Office of Science and Technology (POST), 2005)

The UK Government has introduced a range of initiatives to raise public awareness of the potential negative consequences of excessive alcohol consumption including: the New Licensing Act; The Alcohol Harm Reduction Strategy for England and the *Choosing Health* White Paper (POST, 2005). The Alcohol Harm Reduction Strategy for England (Prime Minister's Strategy Unit, 2004) highlights the role of education in altering attitudes to excessive alcohol use, alongside the early identification and treatment of alcohol problems. Similarly, NICE guidelines highlight the need for a population level approach to alcohol misuse (NICE, 2010). NICE suggest that health services focus on offering screening and brief interventions regarding alcohol consumption to a large number of people, identifying and treating potential problems early on (NICE, 2010). Government policy in the UK has continued to focus on altering attitudes to excessive alcohol consumption, particularly in 18-24 year olds who they consider to be amongst those who "cause and experience the most harm" in terms of alcohol consumption (HM Government, 2007, p.6). More recently, in recognition of the pre-drink culture, it has been proposed that a minimum unit price for alcohol should be introduced in the UK (HM Government, 2012). Currently in the UK it is common for young people, particularly students, to buy alcohol from the supermarkets and drink at home prior to going out as a way of saving money, introducing a minimum price per unit would effectively reduce the financial benefit of drinking in this way. All of these strategies aim to address binge drinking in young adults in the UK, a significant proportion of which are university students. Patterns of alcohol consumption and alcohol related harm, specifically in the student population, are discussed below.

Alcohol consumption in student populations

Evidence from around the world suggests that university students drink more than their non-student peers (Kypri, Cronin & Wright, 2005). A meta-analysis concluded that in the UK on average 52% of male and 43% of female students exceed recommended weekly guidelines (Gill, 2002). This indicates that student drinking patterns in England represent more of a problem than those found in the general population of young adults (GLF, 2009).

Reported levels of binge drinking in student populations were also of concern, ranging between 24-64% for males and 14-63% for females (Gill, 2002). The risk of experiencing multiple negative consequences as a result of binge drinking appears to increase with the frequency of the behaviour (Wechsler, Davenport, Dowdall, Moeykens & Castillo, 1994). Documented negative consequences of binge drinking in student populations include: hangovers, missing lectures, falling behind with work, suffering memory loss, acting on impulse in a way they later regret, arguing with friends, drink driving, having unprotected sex, damaging property, getting into trouble with the police and alcohol related injuries and deaths (Wechsler et al, 1994; Hingson, Heeran, Winter & Wechsler, 2005; Kypri, Paschall, Langley, Baxter, Cashell-Smith & Bourdeau, 2009). Excessive student drinking can also negatively impact on non binge drinking peers. For example, disrupted study, disturbed sleep, verbal abuse, physical assault, damage to property and unwanted sexual advances can occur as a result of peers' drinking (Wechsler, Moeykens, Davenport, Castillo & Hansen, 1995).

Within the UK student population, cross sectional and longitudinal data suggests that alcohol consumption is at its highest in the first year of the undergraduate degree course and gradually reduces across the subsequent three years

(Bewick, Mulhern, Barkham, Trusler, Hill & Stiles, 2008). There are several possible explanations for the high rate of excessive drinking by university students in their first year. Wechsler, Lee, Nelson and Kuo (2002) found that living environment impacts upon drinking behaviour in the US college system. Students living off campus with their parents had a lower rate of binge drinking and alcohol related negative consequences than those living in dormitories which allowed alcohol (Wechsler et al, 2002). In the UK first year students tend to live in university accommodation and are away from the protective role of parental influence and monitoring (Ham and Hope, 2003). Complete immersion in the student culture is also likely to lead to increased pressure from peers to drink, via overt offers of alcohol, modelling and exposure to new social norms (Bosari & Carey, 2001).

Traditionally it has been observed that males tend to drink more frequently and in larger amounts than females, resulting in more alcohol related negative consequences, particularly in young male drinkers. More recent population data suggests however, that male and female alcohol consumption may be converging in some age groups. In New Zealand, a comparative study of population alcohol consumption data from 1995 and 2000 found convergence in the amount of alcohol consumed on a typical drinking occasion in the 20-39 year age group (McPherson, Casswell & Pledger, 2004). These findings were tentatively linked to cultural shifts in traditional male and female social roles, for example, the increase in women living alone, working outside of the home in non-traditional occupations and having children later in life (McPherson et al, 2004). It is emphasised that the observation of a significant shift in female drinking patterns towards the male norm, is not the

same as reporting equivalent alcohol consumption, men still drink more than women overall, but female alcohol consumption is increasing (McPherson et al, 2004).

A shift in female drinking patterns has also been observed in Europe. In a survey of students aged 15-16 years old across 35 European countries, the European School Survey Project on Alcohol and Other Drugs (ESPAD) report documents an overall convergence in male and female heavy episodic drinking, defined as five or more drinks on one occasion in the past 30 days (Hibell, Guttormsson, Ahlstrom, Balakireva, Thoroddur, Kokkevi & Kraus, 2009). Although there are documented differences between countries, this general pattern is a worrying one that is likely to filter through to higher education. Students who drink heavily prior to entry to university are more likely to drink excessively while they are at university than students who were light drinkers prior to university (Wechsler, Isaac, Grodstein & Sellers, 1994). In the UK, 52% of male respondents aged 15-16 years old reported heavy episodic drinking in the previous month, compared to 55% of females. Furthermore between 1995 and 2007 heavy episodic drinking has remained fairly stable, 51% to 52%, in males, but has increased from 49% to 55% in females (Hibell et al., 2009).

This pattern of increased heavy episodic drinking in young females has been documented elsewhere. A Parliamentary report stated that in the UK binge drinking, defined as the consumption of twice the recommended daily amount of alcohol, among young British women has increased over the last decade, more so than in any other EU country (Parliamentary Office of Science and Technology, 2005). If this trend continues female alcohol consumption is likely to become an area of increasing concern, particularly given biological factors (e.g. lower body mass) that make women more susceptible to intoxication and alcohol related harms.

Based on the above evidence excessive alcohol consumption in student populations has been identified as a significant problem, particularly for female students and undergraduates in their first year of study. As in the general population, there is interest in developing effective, accessible, universal and targeted alcohol interventions for problem drinking in student populations. One potential solution to this problem has been offered by the development of alcohol interventions using a social norms approach.

The social norms approach

The social norms approach focuses on the influence that the perceived behaviour and attitudes of others has on personal behaviour and attitudes. Based upon early social psychology (e.g. Asch, 1951; Festinger, 1954), social norm theory proposes that individuals will evaluate their own attitudes and behaviour through comparison with the behaviour of similar others and seek to conform to, what they perceive to be, the majority view (Berkowitz, 2004; Perkins, 1997). Social norms can be descriptive (relating to overt behaviour), or injunctive, (representing the prevalent attitude towards this behaviour, namely approval or disapproval), (Cialdini, Reno & Kallgren, 1990).

Individuals can inaccurately perceive the attitudes and behaviour of others as being different from their own, resulting in misperceptions regarding the group norm. Despite this disparity, the drive to conform to the perceived social norm is so strong that individuals change their own behaviour to match the perceived behaviour of their peers. This process of matching personal behaviour to the perceived norm has been observed in relation to alcohol consumption in university student populations in the USA (Berkowitz, 2004; Perkins, 1997) and the UK (McAlaney & McMahon, 2007). Misperceptions of peer alcohol use have also been identified in

adolescents across Central and Eastern Europe (Page, Ihasz, Hantiu, Simonek & Klarova, 2008) and in Australia (Hughes, Julian, Richman, Mason & Long, 2008).

Social norms approach to reducing student alcohol use

The social norms approach to student alcohol intervention is founded on three main assumptions:

1. Misperceptions about others' attitudes and/ or behaviour in regard to alcohol consumption exist within the student population
2. These misperceptions guide personal alcohol consumption, students shift their behaviour to match that of the perceived norm
3. Therefore, altering student misperceptions by presenting accurate social norms will impact on personal alcohol consumption

Evidence of misperceptions in student populations

Research, primarily in the US, has consistently shown that university students are inaccurate in their estimation of peer drinking norms. Both male and female university students over estimate the amount of alcohol consumed by their peers and the degree to which alcohol consumption is deemed acceptable (e.g. Baer, Stacy & Larimer, 1991; Borsari & Carey, 2003; Kypri & Langley, 2003, Larimer, Kayson, Lee, Kilmer, Lewis, Dillworth, Montoya & Neighbors, 2009; Perkins, Haines & Rice, 2005; Prentice & Miller, 1993). This processing bias, or misperception, has been found to be robust across studies and countries. Misperceptions regarding peer drinking behaviour in the UK student population were found to be comparable to those in the US (McAlaney & McMahon, 2007). In their meta-analysis of 23 studies exploring normative misperceptions in students, Bosari and Carey (2003) found that 91% of the student participants believed that others'

drank more, or were more tolerant of alcohol consumption than they were. There is evidence to suggest that normative misperceptions vary with age and are more pronounced in students aged 18-24 than students over the age of 28 years (McAlaney & McMahon, 2007).

Influence of misperceptions on student alcohol consumption

Having established that misperceptions regarding normative drinking behaviour exist in student populations, the social norms approach proposes that these misperceptions influence personal alcohol consumption. Multiple studies have shown that the misperception of normative drinking behaviour is correlated with the quantity and frequency of personal alcohol consumption (Baer, Stacy & Larimer, 1991; Kypri & Langley, 2003; McAlaney & McMahon, 2007; Perkins et al. 2005). Perceptions of drinking behaviour in close friends were found to be most closely correlated with reported personal alcohol consumption (Baer et al., 1991; Bosari & Carey, 2003; Lewis, 2007; Kypri & Langley, 2003; McAlaney & McMahon, 2007). Furthermore, the greater the perception that others drink heavily, or approve of heavy drinking; the higher personal alcohol consumption is likely to be (Borsari & Carey, 2001; 2003).

Studies have used multivariate and regression analysis to partial out the relative contribution of social norms and other risk factors known to be associated with increased student alcohol consumption. Lewis (2007) found that perceived normative alcohol consumption, particularly of close friends, was more influential in accounting for alcohol use in a student sample of high and low risk drinkers, than perceptions of associated risk. Similarly, in a sample of 818 heavy drinking, first year undergraduates, Neighbors, Lee, Lewis, Fossos & Larimer, (2007), found that descriptive norms accounted for a uniquely large proportion of the variance in

predicting alcohol consumption. Perceptions of normative peer drinking behaviour were more influential than gender, fraternity/sorority membership, injunctive norms and enhancement motives, all of which demonstrated small to medium effect sizes (Neighbors et al. 2007). Such findings indicate that interventions that incorporate a social norms component may be more effective in reducing student alcohol consumption than interventions that do not directly address misperceptions regarding normative peer drinking.

The social norms approach aims to correct student misperceptions regarding normative alcohol consumption and subsequently reduce personal alcohol consumption. It has been identified that injunctive norms are prone to a greater degree of misperception (Borsari & Carey, 2003), but that descriptive norms have a greater influence on behaviour (Cho, 2006; Neighbors et al. 2007). Existing alcohol interventions informed by the social norms approach tend to focus on correcting misperceptions in descriptive norms by providing feedback on actual normative student drinking behaviour.

Mode of delivery of social norm interventions

Social norm interventions have been implemented using a range of formats including: social marketing campaigns (e.g. Dejong, Schneider, Towvim et al., 2006); individual (e.g. Baer, Kivlahan, Blume et al., 2001; Bosari & Carey, 2000) or group (e.g. Neal & Carey, 2004) face-to-face brief interventions; mailed personalised feedback (e.g. Agostinelli, Brown & Miller, 1995; Walters, Bennett & Miller, 2000); and electronic interventions (e.g. Bewick, Trusler, Mulhern, Barkham & Hill, 2008; Bewick, West, Gill, O'May, Mulhern, Barkham, & Hill 2010; Lewis, Neighbors, Oster-Aaland, Kirkeby, & Larimer, 2007; Neighbors, Lewis & Larimer, 2004;

Neighbors, Lewis, Bergstrom & Larimer, 2006; Walters, Vader & Harris, 2007). These different formats are discussed below.

Social norms marketing campaigns

Social norms marketing campaigns aim to publicise standard information regarding normative student drinking behaviour. Early social norms campaigns tended to use posters, leaflets and other forms of mass media to provide a clear statement regarding normative alcohol consumption on campus (McAlaney, Bewick & Hughes, 2011). More comprehensive marketing campaigns have also included an interactive website and class projects (Berkowitz, 2004). Social norms marketing campaigns can be an effective and relatively economical universal measure and have been used by universities in the US with reported reductions in high risk drinking of 20% or more (Berkowitz, 2004). However, a number of difficulties have also been identified. First, the campaign relies on students attending to the normative information and processing it in relation to their own drinking behaviour; the statements have to be credible to students and the message must be clear and concise (Lewis & Neighbors, 2006). Second, social marketing campaigns are particularly susceptible to the climate in which they are presented and have been discredited by students as part of a wider institutional clamp down on drinking (e.g. Granfield, 2002; Swanson, Zegers & Zwaska, 2004). Third, evidence supporting the effectiveness of social norms marketing campaigns is mixed (Lewis & Neighbors, 2006). A recent Cochrane Review described the evidence reviewed as inconclusive (Moreira, Smith & Foxcroft, 2009). The review's focus on randomised controlled trials (RCTs) meant that only two multi site studies met the inclusion criteria (DeJong 2006, 2009), data from these two large studies was contradictory (Moreira et al, 2009). Proponents of the social norms approach urge that social marketing and

social norms interventions should be considered separately (McAlaney, Bewick & Hughes, 2011). Reported unsuccessful interventions have tended to occur when social marketing was poorly executed and failed to change perceptions; these should not be interpreted as evidence against the social norms approach (McAlaney et al. 2011; Perkins, Haines & Rice, 2005).

Personalised normative feedback

In response to some of the limitations of social norms marketing campaigns identified above, a subset of researchers have shifted their focus towards personalised forms of normative feedback. Personalised normative feedback makes explicit comparisons between reported personal alcohol consumption, estimated peer alcohol consumption, and actual normative drinking behaviour in peers. Making the feedback more personally relevant is thought to increase the saliency of the information and have a greater impact on normative misperceptions and drinking behaviour (Lewis & Neighbors, 2006).

The use of face-to-face screening and brief interventions to moderate alcohol consumption in the adult population is well established (Bien, Miller & Tonigan, 1993; Moyer, Finney, Swearingen & Vergun, 2002) and forms the basis of current NICE guidance in the UK (NICE, 2010). Personalised normative feedback has been integrated into a number of brief student alcohol interventions. Interventions have used personalised normative feedback alongside motivational interviewing (MI) techniques with some success. In a series of studies, Marlatt and Baer demonstrated that a single, individualised face-to-face feedback session can significantly reduce alcohol consumption and alcohol related harms in high risk freshmen college students, relative to a high risk control group (Marlatt, Baer, Kivlahan, Dimeff, Larimer, Quigley, Somers & Williams, 1998; Baer, Kivlahan, Blume, McKnight &

Marlatt, 2001). This reduction was shown to remain up until two years after the intervention (Marlatt et al. 1998), at four year follow up it was not as pronounced (Baer et al. 2001). It is difficult to identify the active ingredient from this multi component intervention that included: self monitoring of alcohol consumption; direct comparison between reported personal consumption and student norms; motivational interviewing; information on alcohol related risk and a discussion of individual alcohol expectancies. Very few studies have looked at the effect of face-to-face personalised normative feedback as a standalone intervention, free from other contributing factors (Lewis & Neighbors, 2006)

Bosari and Carey (2001) tested the efficacy of a single session MI intervention with college students reporting two or more episodes of binge drinking (5/4 or more drinks on one occasion, male and female respectively) in the previous month. The intervention included a social norms component alongside the exploration of positive and negative alcohol expectancies. At a six week follow up they found that participants in the MI intervention group reported significant reductions in the frequency and quantity of alcohol consumed relative to controls. Furthermore, changes in perception of typical student drinking mediated changes in reported alcohol use (Bosari & Carey, 2001).

Such preliminary evidence suggests that normative feedback may be central to reducing alcohol consumption. Agostinelli, Brown & Miller (1995), found that mailed feedback comparing reported personal alcohol consumption with USA population norms reduced weekly alcohol consumption and typical BAC at six week follow up, relative to a no feedback control group. Similar results were reported by Walters, Bennett and Miller (2000) who found that mailed personalised feedback was more effective than a two hour information and motivation group session, plus

mailed feedback. Such findings indicate first, that direct contact is not necessary in order for social norms interventions to be effective and second, that personalised normative feedback alone can impact on alcohol consumption. These principles have since been applied in the development of electronic and Web-based personalised social norms interventions.

Web-based personalised normative feedback

The internet has been identified as a valuable method of disseminating health information (Ritterband, Andersson, Christensen, Carlbring & Cuijpers, 2006) and the use of Web-based intervention in health care has increased rapidly over the past decade (Miller, Neal, Roberts, Baer, Cressler, Metrik & Martlatt, 2002; Wantland, Portillo, Holzemer, Slaughter & McGhee, 2004). In a recent study by the WHO, a pattern of significant growth in the use of the internet for health purposes was identified across a sample of seven European countries between 2005 and 2007 (Kummervold, Chronaki, Lausen, Prokosch, Rasmussen, Santana, Staniszewski & Wangberg, 2008). Approximately half of the population in Europe (52.2%) are now estimated to use the internet to access health information (Kummervold et al., 2008). This percentage was particularly high in the 15-25 year age group, with an estimated 60.7% of men and 68.4% of women searching for health information on line (Kummervold et al., 2008). In the UK specifically, the official health service website NHS Choices now gets 10 million visits every month, compared to 7 million in 2009 (NHS Choices, 2011).

The delivery of health interventions over the internet has been favoured by researchers for a number of reasons, these include: reducing costs, ease of accessibility for the user, instant access to information, anonymity and reduced stigma (Griffiths, Lindenmeyer, Powell, Lowe & Thorogood, 2006; Miller et al.,

2002, Munoz, 2010). Web-based interventions also allow the user to work through information at their own pace, receive personalised feedback, map their progress, store and return to this information when needed (Griffiths et al, 2006; Ritterband, Gonder-Frederick, Cox, Clifton, West & Borowitz, 2003; Sobell, Brown, Leo and Sobell, 1996). Evidence-based internet interventions have been identified as a potential means of addressing global health care disparities, by providing accessible, resource efficient, sustainable services where local health care services are limited (Munoz, 2012). Due to these significant advantages the last decade has seen a considerable increase in the development of Web-based structured interventions for a number of health issues including: smoking cessation, alcohol use disorders, depression and anxiety disorders amongst others.

Despite the practical utility of Web-based interventions, developers are warned to remain mindful of why they have chosen to produce a Web-based intervention rather than using a more traditional format and to directly compare the efficacy of different modes of delivery where possible (Griffiths et al, 2006). Recent meta-analyses of Web-based psychotherapeutic interventions, largely based on cognitive behaviour therapy, report an overall effect size comparable to that of traditional face-to-face interventions (Andrews, Cuijpers, Craske, McEvoy & Titov, 2010; Barak, Hen, Boniel-Nissim & Shapira, 2008). Furthermore, no significant difference in effect size was found between Web-based and face-to-face interventions in a sub set of studies allowing direct comparison (Andrews, Cuijpers, Craske, McEvoy & Titov, 2010; Barak, Hen, Boniel-Nissim & Shapira, 2008). Good treatment adherence and patient satisfaction were also reported for the Web-based interventions (Andrews, Cuijpers, Craske, McEvoy & Titov, 2010).

Evidence supporting the use of Web-based interventions continues to grow; however, it is not yet clear what factors determine effectiveness. It has been suggested that Web-based interventions need to target specific conditions, match the content to the level of the intervention (e.g. prevention vs. active treatment), present information in a clear, user-friendly format and in the case of computerised therapy, include some form of therapist support (Andersson, Carlbring, Berger, Almlov and Cuijpers, 2009). Further research is needed to identify the active ingredients in Web-based and computerised interventions, as well as establishing the most effective and safest way to support their use (Carlbring, Andersson & Kaldo, 2011). Despite remaining questions, computerised interventions are already well established in the UK and have infiltrated health services to such an extent that they have already been included within the NICE Guidelines for the treatment of mild to moderate depression (NICE, 2009).

As in other areas of health promotion and intervention, electronic screening and brief intervention is fast becoming a feasible approach to promoting safe alcohol use, researchers are in the process of creating a comprehensive evidence base to support its use (Walters, Miller & Chiauzzi, 2005). Specifically in the field of student alcohol use, computer-based assessments have been shown to have test-retest reliability (Miller et al, 2002) and produce data equivalent to that of traditional paper-based questionnaires (LaBrie, Earleywine, Lamb & Shelesky, 2006). In light of the significant advantages of using computer based formats over traditional methods, a number of electronic alcohol intervention programmes have been developed in parallel. Electronic interventions can be targeted and delivered via CD-ROM, or accessed universally via the internet (Walters et al, 2005; Elliott, Carey & Bolles, 2008). It can be difficult to identify the precise way in which the electronic

feedback is delivered in studies. As technology has developed, however, the use of Web-based formats has become more common. In keeping with this development I will refer to Web-based interventions, unless otherwise stated.

When specifically considering the social norms approach to student alcohol moderation, the use of Web-based programmes to communicate personalised normative feedback offers some distinct advantages. First, Web-based social norms interventions offer a convenient and economical method of disseminating instant, personalised feedback to a large number of students (Copeland & Martin, 2004, Miller et al, 2002). Second, the use of computer-based assessment can appear less threatening than a face-to-face meeting, increasing the disclosure of sensitive information (Turner, Rogers, Lindberg, Pleck & Sonenstein, 1998; Gerbert, Bronstone, Pantilat, McPhee, Allerton & Mo, 1999; Sobell, Brown, Leo and Sobell, 1996). Third, programs can be tailored to the individual, and completed at the students own pace, allowing them the option to pursue more formal interventions if necessary (Walters et al, 2005). Fourth, adolescents and young adults may be particularly amenable to Web-based intervention. A survey in the US found that as many as two thirds of 15-24 year olds have accessed health information online, nearly a quarter of these reported searching for information on drugs or alcohol (Kaiser Family Foundation, 2001) and this is likely to have increased over the last decade. Preliminary studies have indicated that students prefer Web-based screening and brief intervention to a practitioner delivered equivalent, or pencil and paper formats (Kypri, Saunders & Gallagher, 2003; Miller et al, 2002).

Like other face-to-face formats, the content of Web-based social norm interventions varies considerably. Some interventions focus purely on the personalised normative feedback (e.g. Lewis et al, 2007) others use feedback in

combination with information regarding alcohol related harms (e.g. Bewick et al, 2008, 2010). When comparing five commercially available online alcohol education and intervention programs in the US, common components were education (regarding the effects of alcohol) and personalised feedback regarding drinking (Walters et al, 2005).

Inconsistencies in design and methods of evaluation have made it difficult to establish the efficacy of Web-based interventions (Bewick, Trusler, Barkham, Hill, Cahill & Mulhern, 2008). In a systematic review of 10 studies, Bewick et al, (2008) concluded that evidence regarding the effectiveness of Web-based alcohol interventions was inconsistent and the general quality of the studies was low. The web interventions included in this particular review were not aimed specifically at decreasing student alcohol consumption, nor did they all provide normative feedback (Bewick et al, 2008). It was noted that those Web-based interventions which included personalized feedback reported more favourable outcomes than those without personalised feedback (Bewick et al, 2008).

A qualitative review of computer-based interventions (including CD-ROM and Web-based formats) designed specifically to reduce college drinking, considered data from 17 RCTs (Elliott et al, 2008). The review concluded that "e-interventions are usually more effective than no treatment and approximately equivalent to alternative intervention approaches" (Elliott et al, 2008, p.1001). Further analysis identified that reductions in perceived drinking norms mediated the effects of the intervention in several of the studies included in the review (Elliott et al, 2008). A Cochrane Review looking specifically at social norms interventions aimed at reducing alcohol misuse in university students identified seven RCTs evaluating the efficacy of electronic interventions (including both CD-ROM and Web-based

formats). The review concluded that web and computer based normative feedback interventions are effective in reducing student alcohol misuse in the short and medium term and can be as effective in reducing the frequency and volume of alcohol consumption as an identical face-to-face intervention (Moreira et al, 2009). Data from each of these reviews suggests that personalised normative feedback appears to be central to effective intervention and it is the content, rather than the delivery of the intervention that is paramount (Bewick et al, 2008). Further systematic evidence is needed to support the use of Web-based interventions. Studies will need to balance the advantages offered by the web format, against their efficacy in reducing student alcohol consumption relative to face-to-face interventions.

The role of reference groups in social norm interventions

The evidence reviewed above suggests that students are influenced by the perceived drinking norms of their peers. The key component of social norm interventions, therefore, is their use of normative feedback to correct misperceptions regarding peer alcohol consumption. According to evidence from social psychology, the saliency of the referent feedback group is important; people are more likely to be influenced by a large, proximal, strong and personally similar group (Festinger, 1954; Latane, 1981). This suggests that the reference group to which the normative feedback refers is likely to impact upon the effectiveness of social norms based student alcohol interventions (Lewis & Neighbors, 2006).

A wide range of different reference groups have been employed in social norm interventions. As many as 18 different targets ranging between *your best friend* to *an average student* have been identified in the literature (Borsari & Carey, 2001). Commonly, normative feedback will be based on the typical student,

assuming a certain level of homogeneity across the group. In one of the few studies to explore what constitutes the average student, it was found that nearly 95% of men and approximately 50% of women assumed that the average student was male (Lewis & Neighbors, 2006). Such assumptions are likely to affect both the estimation of peer drinking norms and the way in which normative feedback is interpreted by the individual (Lewis & Neighbors, 2006). Women in particular, may be more likely to view their alcohol consumption permissively if it is contrasted to male norm, rather than same sex peers.

No standard way of defining and ranking the saliency of reference groups currently exists. A recent meta-analysis looking specifically at factors affecting misperceptions, ascertained that as a reference group becomes more distant from the individual misperceptions regarding drinking behaviour tend to increase (Bosari & Carey, 2003). For example, misperceptions regarding alcohol consumption of the "typical student" are more pronounced than misperceptions regarding students of the same gender, same ethnicity, or same University residence (Larimer et al., 2009). A consistent finding across studies is that reported alcohol consumption is most closely associated with perceived levels and approval of drinking in the individual's most proximal reference group (e.g. close friends) (Baer, Stacey & Larimer, 1991; Cho, 2006, Maddock & Glanz, 2005; McAlaney & McMahon, 2007). One interpretation is that the influence of normative information is hierarchical, with the norms of *close friends* exerting a greater influence on behaviour than those of the *average student* (Baer, Stacey & Larimer, 1991; Cho, 2006; Perkins, 1997).

Despite the centrality of providing salient normative feedback within the social norms approach, researchers have yet to better understand the extent to which individuals identify with different referent groups and how this affects their response

to normative feedback. It could be predicted that feedback that corrects misperceptions at the level of the most proximal and salient normative group will have greater personal relevance and impact upon the individual's attitude and drinking behaviour (Baer, Stacey & Larimer, 1991; Bosari and Carey, 2003; Lewis & Neighbors, 2006).

Perceived same sex student norms were found to be more strongly related to personal drinking behaviour than opposite sex norms (Lewis & Neighbors, 2004). This finding was followed by studies confirming that same sex specific and first year specific personalised normative feedback is effective as part of an intervention for student drinking (Lewis and Neighbors, 2006; 2007; Lewis, Neighbors, Oster-Aaland, Kirkeby & Larimer, 2007). However, the specific feedback was not consistently more effective than non-specific feedback and it has been suggested that the extent to which participants identify with the referent group is important (Lewis & Neighbors, 2007). This caveat has been found to apply to same-sex students, same-race students and same-Greek status students. The greater the personal identification with the sub group, the more influential the perceived norms for that specific group are on personal alcohol consumption (Neighbors, LaBrie, Hummer, Lewis, Lee, Desai, Kilmer & Larimer, 2010).

Research, predominantly conducted in the USA, suggests that the personal saliency of a referent group may be particularly relevant to gender. Female students who identified strongly with their female identity were found to be more responsive to same sex personalised normative feedback, relative to participants who rated their female identity as being less important (Lewis & Neighbors, 2007). If substantiated further these ideas may be important in understanding gender convergence in drinking behaviour. Created by the UK media in the 1990s and now widely

recognised, the term ‘ladette’ encapsulates the idea of a young female who behaves in a stereotypically male way, including the excessive consumption of alcohol (Jackson, 2006). Cultural factors are important to social norms interventions, it appears that it cannot be assumed that same sex personalised normative feedback is automatically going to be the most salient referent group. Other research also suggests that the influence of gender is not straight forward. When assessing the salience of same sex and opposite sex normative referent groups, Lewis (2007), found that perceived norms in same sex close friends had the greatest influence on female drinking, however the perceived drinking of opposite sex close friends exerted more of an influence on male drinking. Given the centrality of the salience of the referent group to social norm interventions this is clearly an area that requires further research.

Only a small number of studies have specifically examined the impact of referent feedback group on intervention outcome. It may be more appropriate, at this early stage in our understanding, to look in more detail at the processing of personalised normative feedback and the referent group used on an individual level. Examining personal responses to normative feedback may help us to understand what kinds of information are drawn upon when processing personalised normative feedback and if indeed participants even attend to the referent group used.

In summary, excessive alcohol consumption in the university student population is a concern. The social norms approach to student alcohol intervention proposes that students over estimate normative peer alcohol consumption and this misperception guides personal alcohol consumption. Brief interventions have been developed that provide accurate normative feedback to students regarding peer alcohol consumption. These social norms interventions have been developed across

a number of modalities and often incorporate a range of information alongside the normative feedback. There is evidence to support the efficacy of social norms interventions that communicate personalised normative feedback on an individual basis, both face-to-face and via the internet. Researchers have begun to explore how the saliency of the reference group presented in the personalised feedback affects the outcome of the intervention; as yet this is poorly understood.

Unitcheck

Unitcheck is a Web-based alcohol intervention that provides personalised normative feedback to university students in the UK (www.unitcheck.co.uk). Currently, students at the University of Leeds are routinely informed about the Unitcheck website and invited to access it online. Unitcheck asks students to provide details of their personal alcohol consumption and to estimate the amount and frequency of alcohol consumed by their peers. The system then provides instant personalised feedback based on the individual's reported personal alcohol consumption in relation to the actual, same sex, student norm. At present the referent group used in the feedback is labelled as "University of Leeds students".

In order to calculate individual alcohol consumption and give personalised normative feedback the existing Unitcheck programme routinely collects the following information:

- Personal details (age, sex, year of study)
- Alcohol consumption over the past 7 days (frequency, amount, time span)
- Alcohol Use Disorders Identification Test (AUDIT) (quantity and frequency of alcohol consumption, problems related to use and dependency symptoms)
- CORE-10 questionnaire (psychological well being)
- Readiness to change current alcohol consumption

- Estimates of drinking amongst other student groups (course, Leeds University, UK Universities)
- Feedback regarding the website

The instant personalised normative feedback that students receive explicitly reports the percentage of University of Leeds students that drink less than the participant in the average week. Participants are told the percentage of students that drink a similar amount as them and the percentage of these that consider that their drinking has a negative effect on their finances, studies and physical health. Normative student drinking is also presented graphically as a pie chart, with an indication of how the participant compares to their student peers. A similar comparison is made between the number of reported episodes of binge drinking in the previous week and the student average. The normative data provided is sex specific feedback, however, it is not labelled as such on the current programme.

In addition to addressing student misperceptions regarding alcohol consumption, Unitcheck provides personalised information and advice regarding alcohol related health risks. The reported total number of units consumed over the previous week is compared to recommended alcohol guidelines and associated health risks. Similarly the average and highest number of drinks consumed on one occasion is calculated and compared to national recommendations. Unitcheck also compares the number of reported alcohol free days and the amount of water and food consumed during drinking episodes to the student average. Advice on sensible drinking and available sources of support are then presented (Bewick, 2010).

In an RCT involving 506 students, the Unitcheck intervention was found to significantly reduce the average number of alcohol units consumed *per occasion* at 12 week follow up, but not the total amount of alcohol consumed over the week

(Bewick et al, 2008). More recently, a multi site study across 4 UK Universities found a significant decrease in total units consumed over the week in participants allocated to the Unitcheck intervention condition (Bewick et al, 2010). Although these findings are promising, like other existing Web-based interventions, more work needs to be done to identify the active components within the programme and understand how students relate to them.

Summary

Social norms interventions aim to correct student misperceptions regarding peer drinking, prompting reduced personal alcohol consumption. Unitcheck, is one such Web-based intervention that is accessed by students at the University of Leeds. Unitcheck provides instant personalised normative feedback, directly comparing reported personal alcohol consumption with normative peer alcohol consumption. Previous research has tended to use quantitative methods to assess the efficacy of social norms interventions. Very little is known about how students respond to social norms interventions on an individual basis, or how the saliency of the reference group used in the normative feedback affects this reaction. Qualitative research may help to deepen our understanding of how social norms interventions work on an individual basis.

Research aim and objectives

Aim:

To explore how students reporting alcohol consumption above recommended weekly limits at the University of Leeds, respond to instant, online personalised normative feedback.

Objectives:

- ascertain what, if any, aspect of the instant personalised normative feedback is attended to by participants
- explore how relevant and credible students consider the instant personalised normative feedback to be
- examine whether this instant personalised normative feedback is responded to differently when presented in the context of a more or less socially proximal normative referent group

METHODS

Context

All University of Leeds Students are informed of Unitcheck routinely by Student Support Services as part of the first year induction process. Usually, students will independently access Unitcheck online and receive instant personalised feedback on their alcohol consumption. Student data is stored anonymously and not followed up personally by a third party. In this study, the researcher asked participants to complete Unitcheck and was present with them while they worked through the programme. A copy of the live Unitcheck programme was created especially for use in this study. The study version of Unitcheck differed from the original in the way in which the normative feedback was labelled. In the live Unitcheck programme students are given same sex specific normative feedback, but it is not labelled as such. In the study version of Unitcheck the normative feedback was either identical to existing Unitcheck feedback, or labelled as being same sex specific (see appendix 10 for a summary of the changes made). In all other respects the content of the feedback was identical to that provided by the live Unitcheck programme.

Design

A between-subjects experimental design using qualitative methods of data elicitation. Participants were assigned randomly to one of two normative feedback groups:

Group A: Individual drinking behaviour compared with University of Leeds students of the same sex, labelled as being female or male University of Leeds students.

Group B: Individual drinking behaviour compared with University of Leeds students of the same sex, labelled only as University of Leeds students.

The control group, Group B, received feedback identical to that currently provided by the live Unitcheck programme. The experimental group, Group A, received normative feedback labelled as being same sex specific, but was in all other respects identical to the feedback given in the control group. The manipulation of the labelling of the normative comparison group was intended to alter the proximity of the referent group. It was hypothesised that the same sex specific normative feedback would be a more proximal comparison group than the sex neutral normative feedback. It was predicted that in the same sex specific feedback group the closer proximity of the reference group would increase the perceived relevance of the normative feedback and may impact on participant response to the normative data.

The version of Unitcheck used in the study was identical to the live Unitcheck programme, only the labelling of the referent comparison group used in the normative feedback was altered. The study version of Unitcheck was accessed online at the following address: http://ab.unitcheck.x-labsystems.co.uk/EnterCode?id=4DD0AC67-F96B-4D15-958C-F4ACC197FD8F. Participants were asked to log into the site using pre generated codes. These codes determined which of the two normative feedback conditions the participant was allocated to. The normative feedback was labelled as being either generic student or same sex specific student feedback. In all other respects the content of the feedback, was identical across the two conditions. The participant data inputted into the study version of Unitcheck was stored separately to that from the live Unitcheck programme.

The current study employed a think-aloud method and semi-structured interview to examine how individual participants perceive and respond to instant personalised normative feedback information. While quantitative measures are appropriate as a means of establishing efficacy, they can restrict the range and form of the resulting data (Cooligan, 2004). Whereas, qualitative research methods offer "a unique tool for studying what lies behind, or underpins, a decision, attitude, behaviour or other phenomenon" (Ritchie, 2003, p.28). Qualitative methods are well suited to meet the aim of this study, producing in depth data representing a range of individual responses to the normative feedback information. Consequently, qualitative methods were selected as the most appropriate means of accessing the full range and potential fluidity of participant opinion.

As part of a quantitative study, Lewis and Neighbors (2007) observed that as the researchers gave students a print out of their personalised normative feedback, participants would occasionally make comments, most commonly expressing surprise or questioning the accuracy of the norms presented. This observation suggested that participants would be willing and able to communicate their responses to the personalised normative feedback provided in the current study. It also seemed feasible that using the think-aloud method participant responses could be captured concurrently with their engagement with the Unitcheck resource.

Pilot study

It was difficult to predict the content and quality of the data elicited by the think-aloud component, so the study was piloted. Three colleagues with no prior knowledge of the aim or format of the study consented to take part in the pilot, two of these were audio recorded and transcribed. The pilot provided valuable

information regarding the kinds of responses that might be expected and guided the revision of the interview schedule and think-aloud instructions.

Think-aloud method

The think-aloud method, or Verbal Protocol Analysis, refers to a methodology whereby verbal reports generated by participants under specific circumstances are used as data (Green, 1995). Participants are asked to verbalise their thoughts whilst they complete a task, or immediately afterwards (Ericsson & Simon, 1980). The resulting verbal protocol is used as a means of "inferring thought processes and heeded information from behaviour" (Green, 1995, p.126). The think-aloud technique was initially developed as a way of gaining insight into problem solving. The method has since been used as a way of accessing a range of cognitive processes, including decision making and user interactions with a prototype interface design (Abhyankar, Bekker, Summers & Velikova, 2011; Wright & Monk, 1991).

Ericsson and Simon (1980, 1998) recommend a number of ways to increase the validity of responses. They propose that verbalisations should ideally occur concurrently with the task to minimise interference from secondary processing and to reduce loss of data due to poor or incorrect recall. The researcher should avoid asking for descriptions or explanations, as these require the participant to further process the information and may divert them away from their initial train of thought. In addition, participants should be given a warm up task to practice the technique, increasing the quality of the resulting data (Ericsson & Simon, 1998). Ericsson and Simon propose that, ideally, the think-aloud procedure should involve as little interference from the researcher as possible, even instructions to keep talking should be brief. It has also been suggested that researchers sit out of view of the participant where possible to avoid prompting conversation (Gilhooly & Green, 1996). The

participants' verbalisations are usually video or audio recorded and transcribed. The resulting verbal protocol is generally incomplete and unstructured, but provides a purer insight into how an individual is focussing their attention and reacting to information than a retrospective report. It is then up to the researcher to segment, code and analyse the data in order to infer the mental processes that are occurring (Green, 1995).

One of the objectives of the current study was to establish how relevant and believable students consider the personalised normative feedback to be. In the think-aloud method the investigator purposely avoids leading or questioning the client, so there is no guarantee that participants will comment on the area of research interest. Furthermore, the quality of participant responses can vary greatly (Gilhooly, 1986) and the resulting verbal report may be fragmented and lacking in detail. To address these potential problems the think-aloud task was followed with a semi-structured interview.

Semi-structured interview

Semi-structured interviews are an established qualitative technique for eliciting data regarding participants' views and experiences (Britten, 2006). The second objective of this study was to assess how relevant and credible students consider the personalised normative feedback to be. The believability and credibility of the normative information presented may be important to the way in which the feedback is received by students (Berkowitz, 2005; Lewis and Neighbors, 2007). Social norms interventions rely on providing people with accurate and credible information about how other people think and behave, prompting them to question their own attitudes and behaviour, it is therefore paramount that this information should firstly be attended to and secondly believed. A semi-structured interview was

thought to be an appropriate way of addressing these specific questions, while still allowing the researcher the flexibility to explore individual participant responses (Britten 2006; Burman, 1994).

One of the objectives of the study was to ascertain if the normative feedback was consciously noted by participants. To avoid leading the participant towards discussing the normative information, the interviewer initially asked about the information offered by the study version of Unitcheck in general terms. To help focus discussion, the interviewer asked participants to rate how believable and relevant they found the feedback on a Likert numerical rating scale. Participant ratings were followed with open ended questions encouraging them to explain the reasons behind their decision. The interview concluded with questions specifically relating to the personalised normative feedback (see appendix 8 for interview guide)

Ethical permission

Ethical approval for the study was granted by the Leeds Institute of Health Sciences and Leeds Institute of Genetics, Health and Therapeutics and Leeds Institute of Molecular Medicine (LIHS, LIGHT, LIMM) joint ethics committee. A copy of the letter confirming ethical approval can be found in appendix 1.

Participants

At the time of recruitment all participants were in their first year of study and residing in university halls of residence. By the time of the interview approximately half of the sample was in the first term of their second year. As per the selection criteria, at the point of recruitment all participants reported weekly alcohol consumption above recommended guidelines (more than 14 units for females, or over 21 units for males). Mature students, over the age of 21 at entry to University, were excluded from the study due to changes in alcohol consumption and peer

drinking misperceptions that occur with age (Bewick et al. 2008; McAlaney & McMahon, 2007). International students were also excluded from the study due to the potential influence of different cultural norms and identity on the way in which the normative feedback was received.

Sample size

There is no definitive rule for calculating the required sample size in qualitative research. Rather, sample size depends on the specific research question, the quality of the data elicited and the chosen method of data collection and analysis. The collection and analysis of think-aloud data is time consuming and labour intensive. Consequently, studies that employ think-aloud techniques tend to use smaller sample sizes, 10 participants per condition has been recommended in previous think-aloud studies (e.g. Abhyankar & Bekker et al, 2011). The current study aimed to recruit a minimum of 20 participants.

Materials

Study information and consent

The initial recruitment survey was created using Bristol Online Surveys, a Web-based service that support subscribers to create, run and analyse surveys via the internet. Participants were presented with a study information sheet at three discrete points in the recruitment process: at the start of the recruitment Bristol Online Survey (see appendix 3), at the start of the face-to-face interview and before logging into the study version of Unitcheck (see appendix 5). Participant consent was also collected electronically at the start of the Bristol Online Survey and then again when logging into the study version of Unitcheck (see appendix 7). Study consent was in addition to the standard Unitcheck consent and terms and conditions.

Interview schedule

The semi-structured interview followed the think-aloud procedure and focussed on participant responses to the personalised feedback (see appendix 8 for the interview topic guide). Using a visual aid (see appendix 9) the researcher asked participants to rate on a seven point Likert scale how believable and personally relevant they found the information presented in the study version of Unitcheck. Similar rating scales have been used in previous research, without offering the participant the opportunity to expand on their answers (e.g. Butler & Correia, 2009). In the current study each of the ratings were followed by further questions asking the participant to draw on specific examples from the feedback. At the end of each interview the researcher asked participants to rate how personally relevant they had found the normative feedback. Participants were also asked to identify what they considered to be a more personally relevant comparison group.

Coding frame

One coding frame was developed to categorise all participant utterances during the research interview. Although there were two methods of data elicitation, there was just one research episode, in which the participant went through the Unitcheck resource verbalising their thoughts and answered some questions about their views and experiences of the resource. The coding frame was developed with reference to the approach outlined within framework analysis (Ritchie, Spencer and O'Connor, 2003). Framework analysis offers a deductive, but flexible approach to coding qualitative data (Pope, Ziebland & Mays, 2000).

Framework analysis is a systematic and transparent approach to coding qualitative data that is particularly suited to research in which the objectives are set in advance (Pope, Ziebland & Mays, 2006). The data is broken down into its

smallest components of meaning and these are then grouped to form a structured framework of themes and sub-themes which can be systematically applied to the transcripts. Framework analysis involves cycles of consultation between researchers and repeated revision of the coding categories (Pope, Ziebland & Mays, 2006). By following this process all of the data is represented in the final framework in a refined form. The coding frame (see appendix 12) was applied to transcripts from all of the participant interviews, allowing the researcher to identify common themes and consider the data in terms of the initial research objectives and existing literature.

Procedure

Recruitment and screening

First year undergraduate students residing in university halls of residence were sent an email, by University Accommodation Services, inviting them to take part in the study by completing a brief Bristol Online Survey regarding their alcohol consumption (see appendix 2). As an incentive to participate in the study, everyone who completed the survey was entered into a prize draw to win one of three printer credit vouchers (1x£20, 2x£10). Everyone who accessed the Bristol Online Survey was presented, at the start of the survey, with an electronic participant information and consent form. The Bristol Online Survey asked for basic demographic information (e.g. sex, age, year of study), contact details, and self-reported daily alcohol consumption over the previous week. Participants were also asked to indicate if they wished to participate in the second stage of the study.

Information from the Bristol Online Survey was used to select participants eligible to take part in the second stage of the study. Consenting individuals, aged 21 or younger, reporting alcohol consumption exceeding recommended levels in the

previous week were eligible for participation in the study and formed the pool of participants from which the sample was recruited.

All eligible, consenting participants were sent an email inviting them to take part in the next stage of the study, with an information sheet attached (see appendix 4). Participants were asked to opt into the study by replying to the email, providing their name and telephone contact details. Those who responded were contacted by the researcher (SM) and a face-to-face interview was arranged. In total 98 female and 58 male students were invited to participate in the study. All of those who agreed to participate were interviewed and included in the study (n=14 female, n=7 male).

Study interview

The interviews were conducted in a private room on University of Leeds premises using a laptop with internet connection. At the start of the interview participants were presented with a paper copy of the information sheet to read and had the opportunity to ask any questions. Participants were told that the aim of the study was to collect student feedback on the Unitcheck program; there was no specific mention of the personalised normative feedback component or the two normative feedback conditions. The researcher explained the format of the interview and introduced the think-aloud method (see appendix 6). Participants were asked to think their thoughts aloud whilst they worked through the study version of the Unitcheck program. To practice thinking-aloud participants first completed an unrelated warm up task; thinking their thoughts aloud while searching for a kettle on the Argos website.

Once the participants understood the think-aloud task they were presented with the front page of the study version of Unitcheck and given an envelope

containing a unique log in code. The front page included an electronic version of the information sheet identical to the one participants were given at the start of the interview. Participants consented to the study electronically by entering the code and logging into the study version of Unitcheck (see appendix 7 for screen shot).

The code electronically allocated the participant to one of two conditions. Group A received normative feedback labelled as being same sex specific. Group B received normative feedback that was identical in content, but did not label the feedback as being same sex specific (see appendix 10 for examples). Both the participant and the researcher were blind to the feedback condition up until the point that the feedback was presented. The fact that participants were thinking their thoughts aloud while they received the feedback meant that they often read it out loud, or made comments inadvertently revealing to the researcher which condition they were in.

The researcher remained in the room, sitting to the side of the participant while they completed the study version of Unitcheck. If the participant was not vocalising their thoughts the researcher prompted them to continue to respond, "Please keep thinking your thoughts aloud". The think-aloud procedure was followed immediately by the semi-structured interview. Both the think-aloud and the interview components were recorded on a digital audio recorder.

After completing the study participants were thanked for taking part and given the opportunity to ask any questions. If they had any queries regarding Unitcheck these were answered, but the focus of the study on the normative feedback was not revealed.

Coding frame analysis

Themes were derived from the raw data by following the framework approach described by Pope, Ziebland and Mays (2006). The process of analysis used in this study is described below. One researcher (SM) read over a sample of four of the transcripts several times, familiarising herself with the data and split the text into meaningful units. The sample transcripts were purposefully selected to be as representative of the data as possible and included male and female participants from the two conditions reporting drinking ranging from within normal limits to harmful amounts. Meaningful units are a word, phrase, sentence or paragraph that communicates a discrete piece of information with one overall meaning. To reduce researcher bias, these meaningful units were then discussed with HB and BB and a consensus was reached regarding any ambiguous data. Based on this discussion some of the units were revised and the four sample transcripts were revisited by SM and the process repeated. The full content of the four sample transcripts was split up in this way; none of the raw data was excluded from the analysis. This process resulted in a list of 260 individual items, organised under broad headings. Again the list of items was discussed with BB and HB. Based on this discussion the item list was revised and any duplicate items were removed (see appendix 11).

Meaningful units were then grouped together into categories distinguishing between units with similar or different meanings. These groupings were discussed with HB and BB in the context of the research question and existing literature and revised accordingly. The provisional groupings formed a coding framework which was applied to the same four sample interviews. Based on this exercise groupings were again collapsed or refined in discussion with HB and BB. The categories were

discussed and revised several times, resulting in the coding framework made up of themes and sub-themes.

The coding framework (see appendix 12) was then applied to all transcripts using NVivo 9.0 software for qualitative analysis. The final coding framework consisted of thirteen themes: information and evaluation; context, engagement with the feedback, relation of self to guidelines, position in reference group, response to normative feedback, challenging the data, personal code, evaluation of self as drinker, knowledge, change, ratings and miscellaneous.

Due to the volume of qualitative data collected the majority of the interviews were transcribed by an authorised third party. Transcribing interview audio recordings is very time consuming, consequently the outsourcing of transcription is not uncommon in qualitative research (Pope, Ziebland & Mays, 2006). Transcription itself is considered by some qualitative researchers to be a form of analysis (Riessman, 1993), decisions regarding layout and the use of punctuation can impact on the way the text is read and interpreted. Furthermore, familiarisation with the data is central to qualitative analysis and is highlighted by Pope, Ziebland & Mays, (2000) as the first stage in the analysis process. For these reasons, external transcription might be considered a disadvantage. To try and minimise these disadvantages four of the transcripts were transcribed by the researcher (SM) as a means of further familiarising herself with the data. This experience also helped in directing the external transcriber as to the preferred layout of subsequent transcripts, as recommended by Pope, Ziebland and Mays (2006). The main advantage of having the interviews externally transcribed was the time it saved the researcher. It also meant that the way in which the interview transcripts were punctuated was not influenced by any pre conceptions from the researcher.

The final coding transcript included 13 themes, these are described below and illustrated with examples from the interview transcripts. Text in italics indicates that the participant is reading directly from the Unitcheck programme. Each participant was given a unique identifier for the study, these have been included after each quote. The first two or three digits indicate the participant number, "F" or "M" refers to female or male respectively, "A" or "B" refers to the feedback condition.

Information and evaluation: This theme classified utterances from the participants' interaction with the Unitcheck programme, while they were working through the survey questions. This theme explores how participants interpret and respond to the initial survey questions, highlighting any ambiguities or difficulties and how these are resolved by the participant. Self evaluative statements resulting directly from completing the survey were also included as part of the interaction between the participant and the Unitcheck programme. Categories contained within this theme include participant comments on the interpretation of a questions meaning, difficulty in recalling information in order to answer the question and self evaluation resulting from their responses.

> "*How many drinks would you have on a typical day when you're drinking:* **This is bad . . . er, I'm gonna say . . . 10 or mor . . . 7 to 9 or 10 or more not . . . er, typical day – I guess that's an average so I'll do 7-9**. **Um, I feel like I'm trying to answer everything a little bit less so I don't feel so bad about myself.**" (P2,FB)
>
> "...**so I often find that if I start drinking I want to continue because that is what I want my night to be like but it's not like I'm not able to stop so I would have real difficulties answering that question, I guess, I have to try to interpret what the question means like whether which sort of part**

they mean because, no, I would say that I've never, well not never, but very rarely been like 'God I really need another drink', like not able to stop or whatever because that just seems a bit excessive like, doesn't seem like what I do." (P21,FB)

Context: This theme includes comments regarding contextual factors that participants felt increase or decrease student alcohol consumption. Environmental, financial, cultural, social, affective, temporal and historical factors were all linked by participants to changes in alcohol consumption.

"**but it is . . . sports is drinking. It's a massive part of it. I mean I have lots of friends who are like in the sixes and development and they don't join hockey because they like hockey. They join hockey for the socials; for the drinking. Um, so it's just kinda the sports culture at university which is the worse part of my drinking 'cause when I go out with my house or with my friends like I drink, I get drunk, but I don't get *that* bad.**" (P11,FA)

"**I think a lot of students based on, um, you know based on what term it is or if there's exams. Especially 'cause during the start, people have more money; they're more likely to drink a lot more, I guess**" (P14, MA)

Engagement with the feedback: This theme includes statements regarding the perceived acceptability of the non-normative feedback and advice. This included participant responses to the summary of their drinking, AUDIT and CORE results as well as advice on safe drinking behaviour. This theme is concerned with whether participants accept or disagree with the non normative feedback they receive.

"*During the last week you drank more than twice the recommended daily limit* **yeah, I completely agree with that.**" (P8, MB)

“Erm, just that it seemed about right. It seemed correct so I sort of, there wasn't any real shock I don't think... Erm, I think that was fine because I sort of, I expected it.” (P1, FA)

“*To minimise health risks continue to have at least two alcohol-free days a week.* **I shall do**

Alcohol-free days are important as your body needs time to recover. **Yeah**

During the last week you did not have any non-alcoholic drinks when you consumed alcohol <*pauses*> **oh yeah, that's true”** (P18, FB)

Relation of self to guidelines: This specifically includes statements in which participants explicitly evaluate their personal alcohol consumption in relation to recommended drinking guidelines, including recommended weekly units and units per drinking occasion. This is evaluation may lead to an emotional response and consideration of what this means for the participant in terms of consequences and future behaviour.

“I don't know if 28 units is really bad, oh wait there *it is recommended that women do not* **aw my gosh, so I am basically drinking double what I should drink in a week which is a bit worrying...So I guess this is giving me health risks.”** (P5,FA)

Position in reference group: This refers to participants’ statements regarding their perception of their own drinking in comparison to that of their peers, or specific student sub groups. The theme includes references to perceived expected alcohol consumption within a particular reference group, for example, other students on the participant’s course, or first year students. Participant evaluation of their personal drinking behaviour in comparison to others is also included in this theme. This theme also incorporates comments and suggestions from participants regarding the

normative reference group used in the feedback and how this might be made more personally relevant.

> "*Students who attend my university;* **I don't know. I wouldn't know how many people don't drink um, presuming . . . it's a bit stereotypical but I presume all of the people – not all of them but most of the people in the religious societies probably don't drink that much. I'm not sure how many there are though. Probably a fair amount who drink more than me. I know people in my halls do." (**P18,FB)
>
> "**um, probably people in my university . . . I was going to say halls would like sort of maybe, I dunno; maybe like when they're talking about like University of Leeds, I think it would be different year groups [...] so even if people were similar to me in their first year then when they're in later years, they probably drink a lot less um, like with more work and stuff so I suppose like um, Fresher's groups in halls of residence is like more relevant**" (P20,FA)

Response to normative feedback: This theme is concerned with the participants' response to the normative feedback information. It includes the participants' immediate appraisal of the accuracy of the normative feedback information, summarised in statements of disbelief, agreement and neutrality regarding the normative feedback. Emotional responses to the normative feedback, typically surprise, are also included within this theme.

> "**That's quite a lot of students who don't drink! 10% . . . hazardous 20% . . . why's it two . . . ah, two types of hazardous. It's the same anyway, within limit 45% that's a lie. That is so a lie**" **(**P10,FB)

"**erm, <*pauses*> it was slightly . . . some of it was slightly surprising. I mean this bit: *'At least 95% of male university students drink less than you'*. I found that very surprising**" (P19,MA)

Challenging data: This theme includes statements where the participant coherently challenges the accuracy of the personalised normative feedback. These challenges take various forms. Participants may query the composition and provenance of the statistical data, suggesting that the feedback is either less relevant to the participant, or not a true representation of student drinking norms. Some question the legitimacy of definitions of problem drinking and offer their own alternative definitions. Finally, some participants draw on personal observations of student drinking that contradict the feedback information.

"**Then I suppose there's students and stuff what it said: 14,000 or whatever was the number. Um, so I suppose it's quite a mix; there might be people who don't drink at all which would bring the . . . the average down; mature students who might have less um, <*pauses*> I don't know. It's individual circumstances really**" (P16,MB)

"**I think I always considered binge drinkers as like people who don't know how to control themselves and like out of control, and their behaviours awful [...] but it does say at the bottom that binge drinking is drinking 6 or more units in a single go. But I think they need to change that. Because like when you go out for a meal and you have like a bottle of wine or something . . . um . . . and then . . . but you're not binge drinking if you're having a bottle of wine with your meal because you're sat down eating your meal**" (P9,FA)

"**I think I know a lot of people and I kinda know how much they go out so I just think that statistic isn't a true representation of people's actual going out habits**" (P11,FA)

Personal code: In this theme participants state personal standards around acceptable drinking behaviour for university students and what they deem to be acceptable levels of risk. This includes statements of priorities and factors that, in the participants' opinion, over ride negative consequences resulting from excessive alcohol consumption.

"**My immediate reaction to it now is that, yeah, it's telling me what I already know . . . really I know that I'm drinking too much but I don't care. Its part of what Fres . . . like being at university is. And I think most people will, not all, most people will agree your first year you do drink too much and you know you drink too much. But you stop and that's part of the experience of university and growing up**" (P12,MA)

"**So, it's really difficult to <*pauses*> I don't know because I don't feel like it's having a particular harmful effect on me. Clearly it's going to be having a negative effect on my body . . .it's straining my purse a bit but, you know . . . I go to work; I have enough money to drink; I . . . I factor into my budget drinking and enjoy it. I do it sociably. I . . . I don't feel like it's er <*pauses*> hugely negative**" **(**P2,FB)

Evaluation of self as drinker: This theme includes participants' general observations, or self evaluation, regarding their personal drinking style. For example, comments on their personal motives for drinking, patterns of alcohol consumption and consequences of drinking.

"**..but yeah, I do think about it quite a lot. I do find it like quite depressing that I feel the need to like drink to sort of like be comfortable and, yeah, it's not good really**" (P20,FA)

"**..so, it's embarrassing that I'm 21and I feel the need sometimes to have a drink. Not because I can but just because, you know, sometimes I need to to calm me down or something. It's like with smoking or whatever it's like you get a craving for a cigarette, I get a craving for a beer sometimes which is embarrassing.**" (P7,MA).

Knowledge: This theme includes any statement of participant knowledge regarding alcohol strength and classification, recommended guidelines and sensible drinking behaviour. This knowledge might be correct, incorrect or identified as an unknown.

"**I definitely . . . I mean I don't really have a conception of units of alcohol. I don't think most people do. Unless they study it or they . . . or they've done something like this.**" (P17,FA)

Change: This theme encompasses statements indicating a possible shift in participants' thinking about alcohol, or their drinking behaviour as a result of completing Unitcheck. This may be in the form of an expressed intention to change, or not to change their behaviour. More commonly however, participants communicate a willingness to think about their alcohol intake. Participants also commonly highlight the circumstances that they anticipate will prompt them to change in future.

"**So I'm not really sure if it will change my drinking habits or not. Like it might make me think about it while I'm drinking**" (P15,FB)

"**I don't think it will stop me, no because the only . . . I think the only**

thing that would stop me if I did do something really bad like if I cheated on my boyfriend or like hurt somebody; or something like that." **(**P9,FA)

Ratings: This is a record of the participants' numerical rating of the believability and relevance of the feedback. This theme also includes the participants' recall of the normative comparison group and any general comments on the functionality, content and design of the Unitcheck programme.

"**I think it was like sort of like quantified the information and put it in front of you. And like it gave like little pie-charts and graphs and stuff, which like something like I might know that I drink too much but it's not often someone says so and puts a graph in front of me and says 'That's how much you're drinking.' So I think it was interesting to sort of like have a visual representation and like think about it clearly**." (P15, FB)

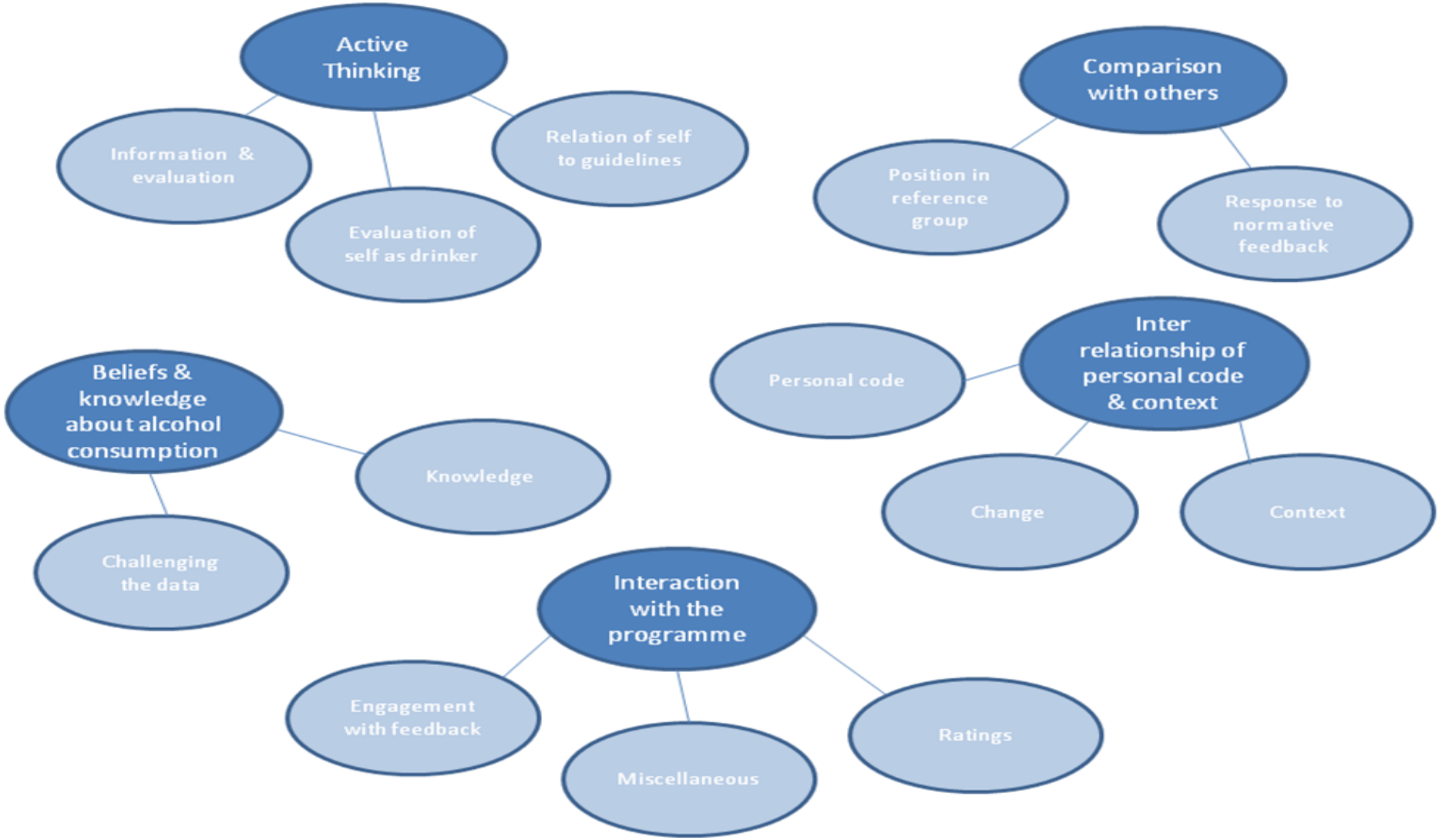
Miscellaneous: This category includes all verbalizations that lack sufficient context or meaning to be independently coded under the previous themes. For example: when the participant was reading information directly from Unitcheck, responding to the interviewer, querying something, or simply inputting demographic information during the registration process. Comments on the think-aloud methodology and irrelevant statements were also included under this theme.

Analysis

The results from this study are presented below in the form of descriptive statistics and direct quotes from participants. Demographic information that is routinely collected in Unitcheck and the Likert ratings are summarised in tables. The majority of the information presented in the results is qualitative data from the verbal protocols and interview transcripts. The themes are discussed under five broader, integrative titles: interaction with the programme; active thinking; inter-relationship

of personal code and context; comparison with others and beliefs and knowledge about alcohol consumption.

Figure 1: Schematic representation of the 13 themes under 5 meta-themes



RESULTS

Out of the 166 eligible participants contacted, 21 (13%) agreed to take part in interview stage of the study. Two thirds of the participants were female (n=14) and the majority (n=19) described themselves as white/white British. The demographic mix of the two study groups was similar in terms of age, year of study and ratio of males to females (Table 1). The groups were also comparable in terms of median scores on the AUDIT and Core measures.

Table 1: Demographic characteristics of participants at interview

		Group A (n=11)	**Group B (n=10)**
Sex	Female	7 (64%)	7 (70%)
Year of study	1st year	5 (45%)	5 (50%)
	2nd year	6 (55%)	5 (50%)
Age (years)	Range	18-21	18-21
	Mean	19.18	19.5
Ethnic Background	White/white British	10 (91%)	9 (90%)
	Mixed British	1 (9%)	1(10%)
AUDIT Score	Range	8-28	11-23
	Median	17	18
CORE Score	Range	0-15	2-18
	Median	6	6.5
Reported units	Range	11.5 – 150	7.5 – 51
consumed per week	Median	36.5	28

At the time of the interview the median reported alcohol consumption in the previous week was higher in Group A than Group B. The unit data for sample A was skewed by two particularly high values, consequently median unit consumption scores have been reported. Both groups reported a median unit consumption score for the previous week over recommended limits. The difference between the reported unit consumption in the two groups was tested for statistical significance using a non parametric test and was not statistically significant. The number of participants reporting drinking recommended, hazardous or harmful amounts is shown in Table 2. Seventeen of the 21 participants reported drinking harmful or hazardous amounts in the previous week. Four female participants reported drinking within recommended limits, three of these were in Group B.

Table 2: Participants reporting hazardous, harmful or recommended alcohol consumption in the previous week in two feedback groups

Level of risk	**Group A**		**Group B**	
	Male (n=4)	**Female (n=7)**	**Male (n=3)**	**Female (n=6)**
Recommended	0	1	0	3
Hazardous	2	4	3	1
Harmful	2	2	0	3

As part of the semi-structured interview, data regarding the believability and relevance of the feedback was collected in the form of a seven point Likert scale. A score of one indicated low believability or personal relevance, whereas a score of seven indicated high believability or personal relevance. Initially the interviewer

only asked for one score for the overall believability of the feedback, however, participants often chose to rate different aspects of the feedback separately. The term "general feedback" includes the unit calculations, information on guidelines, personal consequences of drinking and recommendations. The "normative feedback" ratings refer specifically to the feedback which compared the participants' drinking with that of their student peers. The believability and relevance ratings for the general feedback and the normative feedback are shown in Table 3. Ratings between Group A and Group B are similar for all four categories; there is no statistically significant difference in the ratings between the two groups. There is no clear indication from these descriptive ratings that Group A found the sex specific normative feedback more believable or personally relevant. Both groups rated the general feedback as being more believable than the normative feedback. There is no significant difference in the relevance ratings between Group A and Group B.

Table 3: Participant ratings of feedback believability and personal relevance

		Group A (n=11)	**Group B (n=10)**
Believable (General) 1= low; 7= high	Range	4-7	2-7
	Median	6	6
Believable (Normative) 1=low; 7=high	Range	2-7	2-6
	Median	3	4
Relevant (General) 1=low; 7=high	Range	3-7	4-7
	Median	6	5.5
Relevant (Normative) 1=low; 7=high	Range	2-7	3-7
	Median	5.5	5.5

Themes

In the analysis a coding framework consisting of 13 themes was applied to the verbal data from the think-aloud and the semi-structured interview. These 13 themes were discussed by BB, HB and SM and subsequently collapsed into five broader, integrative themes derived from common meaning or function between themes (see Figure 1). The five meta-themes: interaction with the programme; active thinking; inter-relationship of personal code and context; comparison with others and beliefs and knowledge about alcohol consumption, are described below. Participant response frequencies have been included with the description of the themes where possible. These are purely to demonstrate patterns of responses amongst participants and are not statistically meaningful.

Active thinking

Active thinking refers to themes which involved the participant engaging with the information and relating it to their own experience, often resulting in an evaluation of their own drinking behaviour. Themes included within this meta-theme include: information and evaluation; relation of self to guidelines and evaluation of self as a drinker. In each case participants are actively reasoning where they personally stand in relation to the information they have been presented with. For example, in the following extract a participant considers the impact of negative consequences from drinking, summarised by Unitcheck, on his daily life.

> "[...] **that's your life that's like life recommendations to you and it's saying that I'm it's putting it that I weekly, yeh have arguments with my girlfriend, I break the law, but you know that's and they are because of drinking yeh, arguments with the Mrs are definitely because of drinking she said on our one year anniversary she said that I had a drinking**

problem, I was like well and I think that's literally that's just hit me now.. which is shit, yeh, its literally just hit me." (P7, MA)

Furthermore, in light of this evaluation, participants will often go on to consider the implications for their future behaviour.

"**Oh!** *Last week I had 51 units of alcohol.* **Oh God. That's like 14 . . . is what you're not supposed to go over . . .** *harmful to my health.* **Maybe I should cut down my alcohol intake**" (P10, FB)

There is evidence that this active evaluation starts early on, while participants are still working through the survey questions. In fact, 17 of the 21 participants negatively evaluated some aspect of their drinking behaviour prior to receiving any feedback.

"Um, so that would be 100ml um, 200ml er, lets call it . . . 15 – actually and then I had a couple of shots when I got to the club as well. God <*pauses*> that's really bad!" (P16, MB)

"*How often in the last year have you been unable to remember what happened the night-before because you were drinking:* **weekly. Which is bad. I can never remember a full night."** (P3, FA)

This active engagement with the programme is significant in that Web-based social norm interventions rely on individuals processing information and relating it to their own perceptions. The fact that participants are actively considering the negative implications of their drinking behaviour, from a motivational perspective, is a vital first step in the process of change (Miller & Rollnick, 1991).

Comparison with others

This meta-theme encapsulates the immediate cognitive and emotional reaction of participants when comparing their own drinking behaviour with that of a

specific reference group. Included within this category are: position in reference group and response to normative feedback. Given the centrality of normative feedback within Unitcheck this meta-theme summarises the process of comparison running throughout the programme and into the interview. Some of these comparisons were prompted by specific questions in Unitcheck e.g. participant estimates of where their drinking rates in comparison to other student groups (people on their course, at the University of Leeds, at University in the UK). Others were a spontaneous part of the participants' initial appraisal of the normative feedback that they received. Participant evaluation of the feedback and the specific normative reference group used is also included within this meta-theme.

Estimate of the drinking of others

Nineteen of the 21 participants made statements in which they considered themselves to be part of the majority or average in terms of their alcohol consumption. These statements tended to occur when participants were asked, as part of Unitcheck, to estimate the percentage of students that drank more than, less than and the same as themselves. For example, the quote below, from the think-aloud component, occurred during the aforementioned part of Unitcheck.

> **"Probably say about . . . I'd say a lot of people are on par with me. I'd say about . . . probably say about 40 drink the same as me . . . drink more . . . say about 30 . . . 25 drink less than me . . . 35 there...***University students in the United Kingdom:* **I'd say just general don't really know but I'll just say 50% are the same. It's just a lot easier because I don't really know. I'd say I'm pretty average for a second year uni or a first-year"** (P11, FA)

Participants also referred to drinking more, or less alcohol in comparison to others. These statements were often linked to specific referent groups based on the participants' personal experience.

> **"***Students on your course drink:* **less. I'm gonna be really horrid and say that 60% drink less than me 'cause [gives subject] people are nerds."** (P8, MB)
>
> "**Students on my course my course are actually so annoying so I'm gonna say like 80% of them don't drink as much as me. Aw, they all seem so mature and really annoying,**" (P21, FB)
>
> "*Students on my course:* **Chinese. So quite a lot of people like to work quite hard. So probably maybe <*pauses*> 40% drink less – no, I wouldn't say that – 60% less; 30% the same; 10% more"** (P14, MA)
>
> **"***Right university students in the United Kingdom:;* **I don't know. It's hard. I know my sister goes out every single night. She drinks more than me."** (P18, FB)

Emotional reaction to normative feedback

Having been given normative feedback comparing personal consumption to other student drinking, participants frequently responded to this feedback on an emotional level. Thirteen out of the 21 participants specifically described feeling shocked or surprised by the normative feedback. This surprise was often conceptualised in terms of the participant's own estimation of where they thought they were positioned relative to others.

> **"I was surprised, might be just . . . I was surprised by the fact that I'm not in the same category as most students**" (P15,FB)

“Um, it was a bit shocking to see um, just how much I drink um, particularly 'cause I think that I'm pretty normal and representative of a university student.” (P2, FB)

“Yeh, I just think like ...I am just shocked...I guess I thought I drank pretty much the same as the majority of people and and according to the results they've got on there I don't at all, I drink more than the majority.” (P5,FA)

This initial surprise was sometimes followed by secondary emotions, one participant described feeling guilty, another defensive.

Cognitive reaction to normative feedback

The feeling of shock and surprise tended to be accompanied by an immediate cognitive appraisal of the feedback information as something to be accepted, considered, or not believed. The following examples are taken from the think-aloud procedure and demonstrate the range of the participants’ *immediate* responses to the normative feedback information. Participants expressed a spectrum of reactions ranging from acceptance to disbelief. The most contentious of the normative feedback was the information regarding the percentage of students that drink more than, the same as, or less than the participant. Given that the study specifically recruited heavy drinkers these statistics tended to be extreme and prompted immediate statements of disbelief in six out of the 21 participants.

“At least 75% of students at Leeds drink less than me, no, that's such a lie, oh no, that is such a lie [laughing] **that's really funny.”** (P21, FB)

“At least 75% . . . **they drink less than me – are you sure?!** *Only 20% of female university students drink...* **Really? I don't know if I believe it. Um, a female – I really don't believe it actually”** (P3, FA)

A further seven participants actively considered whether or not the feedback was accurate, drawing on their own personal experience and questioning the data, this response is discussed further under the meta-theme beliefs and knowledge about drinking behaviour. Five participants agreed with this particular statistic and two transcripts were ambiguous. Of those five participants who accepted the normative feedback, two specifically referred to being members of sports societies as an explanation for their results.

> **"***At least 75% of females . . . female University of Leeds students drink less than you.* **I'm not surprised. It's hockey. It's sports that just ruins you."** (P11,FA)

However, having acknowledged themselves as heavy drinkers, both participants then went on to question the reported percentage of students who drink within recommended limits, believing this to be an underestimation.

> **"That's got to be a lie!** *45% of female students drink within the recommended units.* **Definitely not. Definitely not."** (P11, FA)

The remaining three participants who accepted the normative feedback had reported drinking with in recommended limits for the previous week. Even then, two of these participants also stated that the number of students drinking within recommended limits was higher than they had expected.

> **"***In the past week you had 7½ units of alcohol. You shouldn't consume more than 14. Like you the majority of students also drink within the recommended limits* <chuckles a little> <pauses> **um, okay. Interesting to know that the majority of students at Leeds drink within the recommended limit! 'cause that's definitely not what I'd have thought."** (P4,FB)

Only one participant, also reporting drinking within recommended limits, stated that she had expected the number of students drinking within recommended limits to be higher.

> **"And 45% of students drink more than me. That's a bit crazy. I wouldn't have thought it was that much. And 10% never drink. I . . . I would have thought it was more than that. <*lowers voice*> I don't know."** (P18, FB)

Participants in both feedback groups expressed a range of initial responses to the normative feedback comparing their reported alcohol consumption with that of their student peers.

The feedback regarding the negative consequences of drinking and positive drinking behaviour in students tended to be accepted. Eleven of the participants agreed with the normative data on the financial implications of drinking. Six participants acknowledged the negative impact of alcohol consumption on their studies and five recognised the health implications.

In the interview one participant specifically referred to the cognitive process he went through when considering the normative feedback:

> **"**[...] **it's hard to believe but at the same time you do have a niggling feeling that it could be . . . it probably is true. It's just difficult to believe [...] well, yo. . . yo . . . you either feeling that it's hard to believe, it's sort of instantly quashed by the reason in your mind and why it sort of says it's probably right. 'You probably do drink too much and you know it. Stop being a pratt'"** (P12, MA)

There was evidence of changes in opinion throughout the course of the interview, with participants frequently moving between disbelief, consideration and acceptance when considering their drinking in relation to that of other students.

Evaluative comments

At the end of the semi-structured interview participants were asked to specifically comment on the normative comparison group used in the feedback and to identify their preferred, personally salient, referent group. Eight participants specifically commented on the inclusion of normative information on student drinking, identifying this as a particularly interesting and personally relevant aspect of the feedback.

> **"Um, I guess it's more useful to be told in comparison to other students because I know what I'm drinking (I'm *aware* of what I'm drinking) and I already know what I do when I get drunk like so it's just knowing what other people do. 'Cause I guess this is an assumption that everyone else just does the same things"** (P10,FB)
>
> **"Um, I think it was quite good in a way because . . . if you just compared to all people your age, you know you don't, it's not sort of people who you feel like you know or you're in the same group as. Whereas, if you do . . . these are people who are basically like in my community or network or, you know it's my friends. It's people I see every day and I think that makes it quite like feel more personal"** (P15, FB)
>
> **"when it's put like that and when it's compared with other people, I guess it puts it much more into perspective; whereas you only really usually know about how much other people you're with are drinking and obviously that like . . . groups can have an impact on each other and like**

we'll be similar. To know outside Leeds er, outside friendship groups and other students in Leeds and stuff. That's useful, yeah" (P20,FA)

Others felt, however, that the comparison group used in the normative feedback was not sufficiently specific to feel personal.

"[...] **it didn't feel particularly, fit closely to me. I couldn't say, 'Ah, it's the language students in first year, they're drinking less than me. Maybe I should then.' It didn't feel particularly that close to me personally"** (P14, MA)

Five participants from the sex specific feedback group commented on the use of sex specific feedback as a positive distinction. Comments drew on both physiological differences in alcohol tolerance between men and women and also personal identification as part of a specific group.

"I think it was very good that they did just females. It was a very good way 'cause I remember when I was going through the questions, it did prick up in my mind that like when answering this am I going to be compared to like everyone or is there going to be like separation. So it's really good that it was university females 'cause obviously we have very different drinking habits not only what we drink but obviously how much because obviously our bodies can control or take um, so that's very good that it was um, like split into female." (P11,FA)

Two participants from the sex specific feedback condition, objected to the use of female specific feedback and did not feel that it was the most relevant comparison group for them personally.

"[...] **just because we're of the same gender doesn't mean we have . . . we know anything about each other or can connect at all but it might do. I**

think there's . . . there's better ways to define yourself than just being a woman" (P17, FA)

All of these observations were from female participants in the sex specific feedback group (Group A). Whilst two males in the experimental group registered the use of sex specific feedback, this was not explicitly commented upon. Only one participant from the control group suggested using sex specific information in the feedback, again female.

A number of specific alternative normative comparison groups were suggested by participants, these are summarised in Table 4.

Table 4: Suggested alternative normative comparison groups

Comparison group	**Number of participants (n=21)***
Year group	13
Same Age (Student only)	5
Same Age (Working and Student)	4
Degree course	5
Halls of residence	2
Other (Sports, female student, preferred drinking location in Leeds, students from London, family background)	1 (per comparison group listed)

*Some participants made more than one suggestion

Participants frequently made multiple suggestions, some of which were combined. For example, one participant suggested using first year undergraduates of the same age as the participant, another suggested students of the same age and same sex as the participant. It is important to note that the same sex specific referent group is

likely to be underrepresented in the table because participants were explicitly asked to suggest alternative comparison groups to the one used in study.

When asked to consider alternative normative feedback groups 13 of the 21 participants suggested that the feedback should be broken down into year of study. This tied in closely with the wide expectation that certain year groups, specifically first year students, drink more than other years.

> **"**[...] **if you looked the Fresher's would be like miles ahead of everybody else, the second years would probably be up there and the third years I think, I don't know because I haven't been in the third year, but I'm guessing they'd probably calm down a bit more, as you go up Uni I reckon you calm down a bit more so."** (P7, MA)

The majority of the categories were suggested within the context of University Students. Four of the 21 participants felt that a comparison between student and non student drinking would be beneficial. The expectations behind this comparison differed, one participant explicitly expected non student drinking to be lower than student drinking, one felt it would be similar across groups and the other two did not specify.

> **"**[...] **well, I think it kinda would because it puts you in perspective of the rest of the country. University's sort of a very intense place and you sort of forget what's normal. Like what normal levels of things are. Whereas if you're compared to someone who is not at university, and that has to get to work in the morning, and you start to think 'Holy crap. I drink three times as much as him. This is ridiculous'"** (P12,MA)

Overall, statements of expectation and comparison with others were interspersed throughout the transcripts and the normative feedback was frequently

separated out as a focus of interest and further consideration. As one participant describes, the process of comparison is an uncomfortable experience which displaces the student from the security of being in the "average", into the threatening territory of the minority.

> **"Because it makes me seem like I'm like abnormal, um it makes it seem like after reading the information about the other students it makes me feel like I'm not average anymore."** (P21, FB)

The next meta-theme goes on to describe some of the ways in which this change in appraisal is challenged by participants.

Beliefs and knowledge about drinking behaviours

This meta-theme encapsulates two themes: challenging the data and knowledge. This meta-theme describes what participants believe to be true and what they question, or do not know. When considered in the context of the potentially threatening information offered in the form of the normative feedback it is not unexpected that participants might question this feedback and draw on pre- existing knowledge and experience.

Challenges to normative feedback

The way in which participants challenged the normative feedback have been categorised under three headings: challenging the data, challenge based on personal experience, and incorrect input. In each case participants actively question the accuracy and personal relevance of the normative data presented.

Social norms interventions aim to highlight student misperceptions by contrasting perceived normative peer behaviour with information regarding actual normative peer behaviour. It is perhaps not unexpected then that participants

reviewed the normative feedback in light of their own experience and observations of drinking at the University of Leeds. Nineteen of the 21 participants drew on comparisons with friends, or their wider beliefs about student drinking to challenge the normative feedback.

> **"I think how little students drink. That . . . from my . . . my, in my own little head the view of the world, students drink a lot more than that. And I could just be completely wrong but it does make me question the . . . where this place got it from."** (P2, FB)
>
> **"...as a general statistic I didn't believe it because I feel like I have experience of something slightly different"** (P4, FB)

Participants compared their drinking with referent groups of varying proximity ranging from close friends and housemates at the same university, to students at other universities, and unknown others observed on nights out.

> **"Because, erm, everybody that I've met at Leeds University erm always goes on nights out like erm I've never met somebody that doesn't drink and I've never met somebody that doesn't get drunk, so even though there are people that maybe don't get drunk as many days as I get drunk..erm, you know you go out and you're in a club like [names club] which is got, you know, 2500 people in it and most of the girls are completely off their faces, so it's just like where are these people that are in the, are in the under category of me you know where have they been found." (**P5, FA)

These observations were even framed in terms of the wider media stereotype regarding student drinking.

"[...] <***pauses***> **'cause I wonder where all those people are hiding, 'cause that seems like a hell of a lot of people <***pauses***> 'cause you see how rammed all the clubs on a night are in Leeds (on every night of the week) and it just makes – it does give you . . . the media attention that students get at the moment anyway, just generally makes you believe that stu . . . that is student, lifestyle, you know. You . . . you go out; have a great time; you binge drink; you come into lectures hung-over; you do your best and you look a bit of a state. And, I dunno. It is really . . . its endemic in our culture at the moment. So I'm surprised that 75% of people have completely alluded that stereotype"** (P8, MB)

The intensity of these challenges varied with some participants remaining adamant that the normative data was not correct. Others, however, began to tentatively question their own perceptions of student drinking.

"**It made me think about like the students of Leeds University, like, who they are, cos who, it makes me feel like maybe, well I know I've only met like a really small percentage of people here but it just makes me feel like I've got like the wrong impression of everyone entirely or something. Well it's like cos I would say that Leeds University seems like a pretty average uni and like from my experience of uni students in general it just seems like off a bit anyway so yeh, maybe I've just got the wrong impression**." (P21, FB)

"**I thought it'd be a lot higher from what I've experienced. But, then again, I've only been here for a few months. So what I've seen probably isn't very accurate over the course of a whole year like during exam period and stuff, in January I'm sure it will be a lot lower than what it is**

now for example, where people don't necessarily have as much on." (P16, MB)

Eighteen of the 21 participants questioned the provenance, composition and reliability of the normative feedback data. Participants commented on not knowing where the normative statistics had come from, who had conducted the study and who had taken part in the survey.

> **"I study** [gives subject area]**. You have to do like a lot of research methods and stuff, which makes me quite sceptical about statistics and where they're coming from and how many people were asked; in what context and who's asking them. I think there's so many things you've got to consider and like you can't just take statistics on face value and believe them"** (P15,FB)

> **"I guess it would make it more believable if I could see that it was a government website or if – mind you then there's all the political reasons why they'd want people not to drink. I don't know. Everything has bias! If there was a study that you could see and you could . . . you could just see the evidence of the study; where it came from; who conducted it . . ."** (P2, FB)

The composition of the sample used to create the normative data was also a common area of concern for participants. It was argued that the inclusion of third year and post graduate students may have skewed the normative data, reducing the overall alcohol consumption reported and the personal relevance of the data.

> **"When it's . . . I mean 70% of um, University of Leeds students but I guess like that includes third years who are working hard all the time**

and er, post grads and stuff. And you can't really count on everyone to answer particularly honestly." (P14, MA)

"So I don't if it's um, taking a wider range of the entire university, first to third years. I mean is that including post grads and third years, everything, then, yes, I could accept that. But I don't see how it's completely relevant to me." (P19, MA)

In challenging the source of the statistics for the normative feedback data, participants often commented on feeling removed from the comparison group, impacting on their appraisal of the personal relevance of the feedback.

"If it had been just me and my mates. Er yeh, if it was like, you know, its statistics on people who I don't know, or you know, it's just like male students and I know I know none of my mates have taken part in this, er, it's the fact that I don't know who the other people are so I can't, I don't think it's very relevant or I can't relate to that." (P7, MA)

Two participants also questioned the legitimacy of the feedback on the grounds that they had made an error when completing the drinking diary.

Challenging formal definitions

Thirteen participants questioned the legitimacy of the formal drinking recommendations, contrasting guidelines with what they perceived to be the social reality. The formal definition of binge drinking in particular was considered controversial.

"Um, <*pauses*> the binge drinking stuff, it's telling me stuff I already know. And the limits it gives me I'm thinking, 'Yes, they're the official limits but I don't feel they have any basis' . . . well they do have a basis of

variety but it's a rather shaky one considering how much people drink; how much it's sociably acceptable to drink . . . so" (P19, MA)

When asked in the interview to explain how they would describe binge drinking, participants tended to draw on drinking motives and behavioural consequences in their definition, rather than the amount of units consumed.

"Binge drinking would be like, I know I do binge drink, but like I'd say you'd go out on a night and you keep drinking until you're really drunk like that's what binge drinking is drinking til you get drunk." (P21, FB)

"Um, I dunno. I think I always considered binge drinkers as like people who don't know how to control themselves and like out of control, and their behaviours awful. And so being told I'm a binge drinker, I think it's quite insulting actually!" (P9, FA)

Several people commented on their inability to understand their drinking in terms of units and questioned the utility of setting guidelines on this basis.

"I definitely . . . I mean I don't really have a conception of units of alcohol. I don't think most people do. Unless they study it or they . . . or they've done something like this." (P17, FA)

Overall, participants tended to struggle to relate their personal experience of drinking to the framework offered by drinking guidelines and recommendations. This disparity between their perception of student drinking and the feedback was also extended to the normative data. When contrasted across the two study conditions, the pattern of the challenges to the feedback made by participants in Group A and Group B are very similar, see Table 5.

Table 5: Participant challenges to the feedback across study conditions

Challenge to normative feedback	**Group A (n=11)**	**Group B (n=10)**
Challenge based on personal experience	10	9
Challenging the reliability of the normative data	8	10
Challenging definitions	6	7
Incorrect input	1	1

The way in which conflict between personal perceptions and the feedback information was resolved varied between participants and appeared to be largely dependent on personal priorities and contextual factors which are outlined below.

Inter-relationship of personal code and context

This meta-theme consists of three themes: context, personal code and change. Inter-relationship of personal code and context captures how the participants' environmental context interacts with their personal evaluation of what is acceptable drinking behaviour and their attitude towards change.

The sense that participants felt that certain behaviour was the accepted student norm was prevalent throughout the interviews, particularly when considering the consequences of drinking. Behaving in an embarrassing way, having a hangover and missing class were dismissed by seven participants, as being a normal, expected part of university life.

> **"Um . . . er . . .** *I've not gone to work or missed class because of drinking:* **yes, I have. I think everyone at uni has done that once. And if they haven't, they probably shouldn't be at university"** (P12, MA)

Similarly there was an acceptance that the student lifestyle is generally unhealthy and excessive drinking is an expected part of that lifestyle.

> **"Um, yeah, apparently I drink too much. Er, I don't feel like I'm drinking too much. Er, live a pretty unhealthy lifestyle anyway: like super noodles; baked beans; I smoke; I drink. Um, it's not really a healthy combination. I've got something mouldy growing in my room, which smells pretty bad. I'm not sure if that's any good for my health either."** (P13, MB)

A number of participants commented that they had not observed any significant negative effect on their physical health as a result of their drinking and felt confident taking this risk in the short term. Participants tended to neutralise negative drinking outcomes by downplaying their significance and impact.

> **"I don't know because I don't feel like it's having a particular harmful effect on me. Clearly it's going to be having a negative effect on my body . . . it's straining my purse a bit but, you know . . . I go to work; I have enough money to drink; I . . . I factor into my budget drinking and enjoy it. I do it sociably. I . . . I don't feel like it's er <*pauses*> hugely negative."** (P2, FB)

There was a sense that as long as they were aware of the risks and felt in control of their drinking, it was acceptable in the current university context. Furthermore, differences in individual experience and priorities were emphasised as important in assessing the risks from excessive alcohol consumption.

> **"I think with these kinds of surveys where you're talking about somebody's personal experience it's difficult to really understand what . . . how that experience happens or what makes them feel when they don't**

know the individual. So there's a lot of <*pauses*> there's a lot of factors in my life, in my experience, which would, if they weren't there and I was drinking the same amount I was drinking, I think there would be more of a reason to be worried, because it would increase and increase; whereas my awareness is a lot higher than a lot of people's and that's not me . . . that's not . . . I don't mean to sound like I know more than other people but just from experience I feel a lot more in control. And I don't ever crave a drink and I . . . enjoy them. I don't need them. So I think I'm all right personally." (P17, FA)

"I've been drinking for long enough to understand the effects that it will have on me, and how that has to fit in with everything else that I have to do" (P4, FB)

"I don't like it. It just kinda makes me think like 'I'm my own person um, if I can control myself when I am drinking then I don't really care about like how many units I'm meant to be drinking each day.' As long as I don't do something stupid like I am drunk or like do something to dam . . . like hurt me or the people that I care about" (P9, FA)

Drinking was presented as a reward as part of a healthy work life balance within the context of university.

"I don't want to sit down, that's boring being . . . I like doing stuff but I want to be able to reward myself from a hard day's work with going out and seeing my friends and having a laugh. So, yeah, it's basically just I think having a balance is acceptable even though it is very bad for your health" (P11, FA)

Participants perceived excessive drinking as integral to the student experience and accepted any associated risks as a part of that experience. However, the relationship between drinking behaviour and the university context was bi-directional. There was an assumption within the group that as they progressed through university and completed their degrees, their alcohol consumption would automatically reduce.

> **"My immediate reaction to it now is that, yeah, it's telling me what I already know . . . really I know that I'm drinking too much but I don't care. It's part of what Fres . . . like being at university is. And I think most people will, not all, most people will agree your first year you do drink too much and you know you drink too much. But you stop and that's part of the experience of university and growing up and you stop doing it"** (P12, MA)
>
> **"**[...] **maybe if I saw exactly the same in 40 years, 30 years, 20 years or whatever, and I'd been drinking the same amount as I do now (as a first year university student) um, to . . . and I'd been drinking that same amount up until I was 40 or 60 or 75 um, then I'd be a bit more concerned because that's dangerous. But I think providing I can avoid immediate danger, or short-term danger, I don't think that I'll continue to behave in the same way. I don't . . . I don't think it's natural to behave in the same way you do in your first year at university then when you're a Post grad or when you're halfway through your career, or when you're retired. I don't think people do that so it's . . . it's um <*pauses*> it's not relevant right now"** (P17, FA)

Other than leaving university, the group were fairly ambiguous regarding what factors might reduce their alcohol consumption. Three participants suggested that a serious physical health problem clearly linked to alcohol use might prompt them to cut down. Four participants alluded to the possible impact of experiencing a serious negative event as a result of drinking. These tended to be potentially life threatening and involved either the participant, or a close friend or loved one.

> **"I'd have to suffer something very bad when drunk. So, either getting attacked or, I don't know, seeing a friend get hit by a car something like that 'cause they're drunk. Um, I don't think anything from a website would convince me to. I think I'd have to experience it firsthand. Um, I mean I mentioned my foot earlier on when I tripped over drunk in a dark car park, and I didn't drink . . . that was after I was very, very drunk though, I didn't drink that much for about three months afterwards just 'cause a) I couldn't walk properly and b) I knew that I'd really hurt myself being drunk. So I cut it down a lot since then"** (P19, MA)

Financial and work commitments tended to be cited as incidental reasons for drinking less in the short term. Eight participants referred to academic, or paid work as a reason for drinking less. To counteract the financial implications of drinking, participants reported consuming alcohol at home prior to going out. This pre-drink culture was identified as a particularly dangerous way of drinking due to the difficulty of keeping track of how much alcohol has been consumed.

> **"**[...] **when you're out, you get a shot, or a single or a double, or whatever and you can, if not, keep count of every drink at least know vaguely in your head maybe you had like six or seven [...] whereas with**

drinking before you go out . . . well with vodka it's not . . . or spirits, it's not so bad because you can kinda of, like I did – well I'm not very good at maths as you heard, but you can work out how many shots are in a bottle. But with stuff like wine or, I don't know, cider or something like that you might have like, you know the big bottles." (P15, FB)

The dominant message from the group was that participants perceived drinking as an expected part of being a university student. As a result any associated risks were either accepted as the norm, or knowingly entered into in the belief that the behaviour is time limited. Only extreme, potentially life threatening, consequences were perceived to be significant enough to prompt participants to make intentional, long term changes in their behaviour.

"[...] **yeah, it's a conscious decision. Not a great one! That, yeah, that makes it really difficult 'cause I feel like . . . I feel like it's a really stupid decision and I'm continuing to go 'Yeah, fab decision. Keep doing it'. It's like when you decide not to go to a lecture you know it's a bad decision and yet you don't care."** (P2, FB)

However, in contrast to the prevalent resistance to change in *behaviour*, ten participants were willing to concede that they may change the way that they *think* about their drinking. Although, they felt that this was unlikely to translate into behaviour change, at least in the short term.

"I think . . . actually, like I said before like knowing that I'm drinking 14 shots full of vodka I might think a bit more like and think, 'Do I really need 14 shots of vodka 'cause I'm sure I don't. I could just have, you know a quarter of a bottle' [...] like maybe I'm not realising . . . maybe

I'm thinking, 'Oh, yeah, I'm fine' but I'm not actually thinking about how much I've drunk" (P15, FB)

"So, like I think next time I drink like I'll probably think a bit more about it, and tell everyone else off for binge drinking like me . . . but I don't think it'd . . . it'd make me more aware, definitely, but I don't think it'd stop me" (P9, FA)

Interaction with the programme

This meta-theme includes the following themes from the coding framework: miscellaneous, ratings and engagement with feedback. Much of the data coded under these themes is redundant, or is quantitative data that has been presented separately at the beginning of this chapter. Included within these themes, is information regarding how the participants interacted with the Unitcheck programme and what information they recalled from the feedback they were given. This section also includes general feedback on the presentation and content of the Unitcheck programme.

Engagement with the task

Due to the spontaneous, unstructured nature of the think-aloud method it can be difficult to confidently assign meaning to some of the fractured vocalisations. However, the data does allow some insight into how participants approach the task they have been asked to complete. For example, participants frequently read aloud questions and feedback from the programme interspersed with ambiguous vocalisations, or brief asides. Such vocalisations, although difficult to code for meaning, suggest that participants were engaged in the task and responding to the information presented.

Main message

When asked what they thought the main message was from Unitcheck 12 participants felt that it was telling them that they needed to drink less, only one participant stated that they were drinking within recommended limits. Seven participants felt that Unitcheck increased their awareness regarding recommended limits and helped to put their alcohol consumption into perspective. The health consequences of drinking excessively were explicitly mentioned by five of the participants, one participant also mentioned financial consequences. Only one participant highlighted the inclusion of comparison with peers at this point. One participant felt that Unitcheck was "anti-drinking".

Recall of normative feedback

In the semi-structured interview 18 of the 21 participants referred specifically to the inclusion of normative data in the feedback either spontaneously, or in response to general, open ended, questions from the researcher (e.g. "What can you remember from the feedback information?"). When discussing the normative feedback six of the participants described the comparison group as "students", six referred to "University of Leeds Students", three mentioned "female students", one talked about "male students" and two specified "female University of Leeds Students". These deliberate references to the normative comparison were made without any directive from the researcher. Furthermore, the majority of participants were able to be more specific about the normative comparison group when prompted. Only two of the 21 participants made no reference to the normative feedback or comparison group until prompted, both were male. One participant used the computer to look back at his data during the interview so it cannot be established exactly what he recalled.

Feedback on Unitcheck

Throughout the process of the interview participants would often comment on aspects of the Unitcheck programme. Comments broadly related to the presentation, functionality and content of the website.

Participant feedback regarding the design of the website differed. Some participants found the appearance "dull", whereas others felt that it looked professional and therefore more trustworthy.

> **"I think that, I suppose as stupid as it sounds, because the website looks professionally designed, it makes you . . . much more, much more willing to believe it is accurate. The fact that it wasn't covered in all sorts of annoying pop up adverts [. . .] makes it much more believable"** (P12, MA)

It was common for participants to hesitate and query the meaning of a question and some participants felt that the wording of these could be made clearer.

> **"**[...] **in terms of its layout and structure, it's perfectly clear, easy to use. Just some of the wording; the wording of some things are um, slightly ambiguous"** (P17, FA)

In general participants reported that they found the website easy to use.

A number of suggestions and comments were made regarding the content of the website. Participants spoke positively about the use of graphs and charts to display the feedback information; they also appreciated the inclusion of further information and contact details for support services. Where changes to content were recommended participants requested extra information, to further demonstrate what the consequences of drinking excessively might be.

> **"**[...] **if you do answer 'yes' to the question like about like sexual situations or whatever, but there could be like something, some statistics about that; about like alcohol and its impact . . . on like . . . the statistics of sexual assaults stuff like that. And also it's kinda pretty superficial but the calories . . . like I've done a survey before that told me exactly how many calories I was sort of drinking on an average night and that was pretty shocking; and I know it's not necessarily the most important thing for a lot of young women."** (P15, FB)

It was also suggested that it might be helpful to see an example of how staying within sensible drinking limits translates into a typical student lifestyle. This suggestion was saturated with assumptions regarding the student norm and allowances that should be made for this specific group.

> **"I suppose if it gave more like recommendations of sort of like direct recommendation of um <*pauses*> sort of translating a guideline weekly amount – allowing for some excesses because we're students. So saying let's say 8 units on a . . . whatever, and allowing some more than that. So just basically translating what a weekly amount of alcohol should be into what it could be in terms of like so maybe sort of one or two nights out; or a couple of um, pub lunches or stuff like that. Just to sort of translate data into something that you can instantly interpret. Or instantly relate to. It's a sort of similar thing to the um, pints and shots stuff, being converted into units. Because it's very easy to look at units and sort of just ignore it. Whereas if you . . . translate it back into something that's instantly approachable it's much easier"** (P12,MA)

Overall, participants appreciated the way in which the feedback was personally tailored and felt that this helped to keep their interest.

> **“**[...] **it gave me . . . made me more surprised reaction. If it wasn't very personal then I probably would have paid less attention to it”** (P16,MB)

In the next chapter the implications of these findings are discussed in terms of existing research and the future development of Social Norms interventions.

DISCUSSION

The aim of the current study was to explore how students reporting alcohol consumption over recommended weekly limits, respond to instant, online personalised normative feedback. To meet this aim students were asked to work through Unitcheck, an existing Web-based alcohol intervention that provides instant personalised normative feedback, thinking their thoughts aloud. The think-aloud method recorded the participants' immediate reaction to the normative feedback. Further information regarding the believability and relevance of the feedback was elicited in the form of a semi-structured interview, including Likert ratings. Qualitative data from the think-aloud procedure and the semi-structured interview were then transcribed and analysed using Framework analysis.

Study objectives

The study aim was broken down into three objectives which are described below along with the main findings from the study.

Objective 1: Ascertain what, if any, aspect of the normative feedback is attended to by participants

Previous research has tended to focus on testing the *efficacy* of social norm alcohol interventions (e.g. Walters et al, 2007; Neighbors, Lewis & Larimer, 2004; Bewick et al, 2008, 2010), rather than looking specifically at how students attend to the information that they are presented with. In order to correct student drinking misperceptions the normative feedback data first needs to be attended to and recalled, but evidence of this process is currently limited. Findings from the current study indicate that the normative feedback data was noted and actively considered by participants.

First, from the think-aloud component it was apparent that the normative feedback was noted and responded to. It was common for participants to read through the normative feedback interspersing the information presented by Unitcheck with evaluative comments and observations. Although these verbalisations varied in content and clarity they were present in some form in every transcript.

Second, not only was the normative feedback attended to, it was actively considered by participants. This appraisal of the Unitcheck data is particularly evident in those statements categorised as participant beliefs and knowledge about drinking behaviours. Under this meta-theme, participants challenge the legitimacy of the feedback information, questioning how it relates to their own beliefs and life experience. This process of deliberation requires that the participant has noted and can recall the content of the normative feedback in order to then question its credibility. The active consideration of the presented data is also indicative of participants' level of engagement with the Unitcheck programme.

Third, it was noted that in the semi-structured interview 18 of the 21 participants recalled and commented upon the normative comparison group without any prompting from the interviewer. The labelling, and subsequent social proximity, of the comparison group is central to social norms theory and the fact that participants are recalling this information is indicative that the normative feedback itself has also been noted. Indeed, 18 of the 21 participants referred to some aspect of the normative feedback in response to general prompts from the interviewer (What can you remember from the feedback information? What stood out for you?). The precise part of the normative feedback recalled varied between participants. The most commonly commented upon aspect of the feedback was the information

comparing the quantity of alcohol consumed by the individual in comparison to other students at the University of Leeds and the percentage of students that reported harmful consumption, hazardous consumption, or drinking within recommended limits. The normative feedback regarding the reported consequences of drinking and recommendations for safer alcohol consumption were less frequently recalled as something which stood out for participants.

In summary, there is evidence from the current study that normative information is noted and recalled by participants. Furthermore, the normative information appears to be actively considered by participants in relation to their own life experience and perceptions. This is in accordance with social norms theory which aims to identify and correct individual misperceptions.

Objective 2: Explore how believable and relevant students consider the normative feedback to be

In the semi-structured interview students were explicitly asked to rate how believable and relevant they found the non normative and the normative feedback data. These ratings suggest that participants perceived the normative feedback data to be less believable than the general feedback (unit total, information on guidelines, consequences of drinking and recommendations). This trend is supported by the qualitative data, particularly by the meta-theme titled challenges to the normative feedback. The majority of participants queried some aspect of the normative feedback, however, the tenacity of this query varied considerably. Participants frequently challenged the feedback information based on their own experience and observations. They also questioned the reliability of the source of the normative data. It was not only those participants consuming alcohol in hazardous or harmful

amounts that questioned the accuracy of the normative feedback information, so too did participants who reported drinking within recommended weekly limits.

Both the general and the normative feedback were generally considered by participants to be personally relevant. In the qualitative data the use of a student normative comparison group was commented upon as being a relevant and personally meaningful referent group. There was also some indication from the qualitative data that female participants in Group A considered the same sex specific feedback to be more personally relevant than sex neutral feedback. Participants suggested alternative normative comparison groups which they felt would be more personally relevant. Frequently suggested comparison groups included students in the same year of study and students of the same age.

The current study indicates that students can find it hard to believe normative feedback information; this is likely to reduce its potential influence in challenging misperceptions regarding peer alcohol consumption. Recommendations on how to increase the credibility of the normative feedback information are made later in the discussion. Student specific normative feedback was generally considered by participants to be relevant. However, the qualitative data indicates that other possible comparison groups, including same year of study and same age students at the University of Leeds, may merit further investigation.

Objective 3: Examine whether this instant normative feedback is responded to differently when presented in the context of a more or less socially proximal normative referent group

There was no statistically significant difference in the believability and relevance ratings given by the two normative feedback groups. Participants from both feedback conditions rated the general feedback data as being more believable

than the normative feedback information, irrespective of the labelling of the referent group.

When considering the qualitative data, the pattern of participant challenges to the normative data were similar across the two feedback groups (see Table 5). All of the female participants in Group A explicitly commented on the use of a sex specific student comparison group. Five of these indicated in the qualitative interview that they considered female specific normative feedback to be more personally relevant. This was not reflected in the Likert ratings; there was no significant difference in the relevance ratings between the two feedback conditions.

The labelling of the normative referent group was not associated with statistically significant differences in the way in which the normative feedback was rated and responded to by participants. However, there is qualitative evidence to suggest that using a same sex specific normative referent comparison group may impact differentially on female than male participants; this is discussed further below.

Comparison with existing literature

Findings from the current study are discussed in the context of existing research into student misperception of descriptive and injunctive drinking norms; the saliency of the referent comparison group; and previous observation of student responses to normative feedback.

Misperceptions in student drinking

Findings from the current study support previous research demonstrating student misperceptions regarding peer alcohol consumption (e.g. Bosari & Carey, 2003; McAlaney & McMahon, 2007). Despite using a selective sample of heavy

drinking students, participants frequently referred to their personal alcohol consumption as being average, or below average in comparison to that of their "typical" student peers.

Specific instances when participants rated their alcohol consumption as higher than their peers tended to be when participants were relating their drinking to a specific familiar sub group, commonly other students on their course. Whilst there is insufficient information in the current study to comment on the accuracy of specific participant perceptions, this is perhaps in keeping with previous research that suggests students are able to more accurately gauge alcohol consumption in more proximal referent groups (Bosari & Carey, 2003; Larimer et al., 2009). Participants would often draw on specific perceived traits of the group in order to justify their estimation. For example, one participant explicitly referred to a cultural stereotype to explain why he perceived other students on his course drank less than him "Chinese. So quite a lot of people like to work quite hard." Another participant disparagingly described the cohort on her course as being "boring". Both these comments separated the participant from the specific comparison group in question and might be interpreted as a way of undermining the personal relevance of that specific group. It appears that there is a crucial distinction to be made between familiarity with a reference group and the personal saliency of that group.

Overall, and in line with previous findings (e.g. Bosari & Carey, 2003; McAlaney & McMahon, 2007), participants overestimated the amount of alcohol consumed by their student peers and considered themselves to be "average" in terms of their personal alcohol consumption.

The believability of normative feedback

Participants were more willing to accept feedback on their personal alcohol consumption (e.g. units consumed and consequences experienced) than the normative feedback information. Participants challenged the latter on various grounds including their own personal observations, opinions and queries regarding the reliability and representativeness of the data. The participant reaction to the normative data was often marked by emotions, commonly shock and surprise. It was not unusual for participants to state that they simply did not believe the normative feedback information, particularly on their first viewing of the information. This initial appraisal then tended to be further explored by participants and shifted throughout the course of the interview.

Student response to the normative feedback has not been widely investigated, although the expression of surprise and questioning of the normative data was noted by Lewis and Neighbors (2007) when researchers presented participants with printed normative feedback. In her extensive experience of implementing social norms marketing campaigns on a large American University campus, Dr Bauerle has labelled initial student resistance to normative information as "push back" (personal communication, 08/06/12). Speaking recently at the European Symposium on Substance Use among Students (ESSUS) Dr Bauerle likened "push back" to the beginnings of a conversation, opening up the possibility of a change in student perception (personal communication, 08/06/12). Despite queries regarding the believability of the normative feedback information presented and the brevity of the study interview there was some evidence of the beginnings of a "conversation". Participants showed some movement in their estimation of the normative data throughout the course of completing the Unitcheck programme and answering the

interview questions. Participants began to question, not only the reliability of the normative data, but also the reliability of their perceptions of student drinking and their own personal standards of behaviour. The beginning of a movement in perception was perhaps best demonstrated by the fact that ten participants acknowledged a shift in the way they think about their drinking behaviour. This is consistent with previous research suggesting that initial changes in the perception of student alcohol consumption are more likely to occur as a result of social norms campaigns than an overt change in drinking behaviour (McAlaney, Bewick & Bauerle, 2010). This is also in accordance with social norms theory which predicts that changes in student perception of typical student drinking will mediate changes in drinking behaviour (Bosari & Carey, 2001).

In the context of a well established, long term social norms marketing campaign, student scepticism has been addressed by reporting general health related norms, rather than focussing solely on alcohol (Hancock & Wattenmaker, 2009). The ways in which normative data are presented and referenced also influences heuristic processing of information; the more scientific the data looks the more likely it is to be believed (Haines, 1996; Swanson, Zegers & Zwaska, 2004). Providing information regarding the source of the normative feedback used in social norms interventions is currently recommended as good practice (McAlaney, Bewick & Bauerle, 2010; Swanson, Zegers & Zwaska, 2004).

Within the current study participants made a number of comments and suggestions regarding the credibility of the feedback data. The layout of the website was described as professional and the absence of pop up adverts was noted as adding to the believability of the information presented. It was suggested that direct references from health care professionals or the NHS generally would further add to

the legitimacy of the feedback information. Additional explicit information about health risks and other negative consequences, including statistical prevalence was also requested. Several participants commented on the need to clearly reference the source of the data, including who conducted the study and the size and composition of the sample used, particularly year of study. Finally, the way in which students are notified of Unitcheck was highlighted, it was suggested that uptake may be increased if Unitcheck is introduced through the student's faculty, or a society of which they are a member.

Another reported obstacle to participants believing the normative data was the degree of misperception between their expectation of student drinking and the normative feedback presented. Several participants commented that they would have found it easier to believe normative feedback that was more in line with their own expectations. This suggests that believability of the feedback information may be mediated by the degree to which the intervention challenges the participants' beliefs. Social norm interventions aim specifically to highlight the gap between actual and perceived norms. This finding, therefore, poses a dilemma for researchers in providing normative feedback that highlights student misperceptions and creates dissonance, but is still believed.

One possible way of increasing the credibility of the feedback data may be to use same year of study specific normative feedback, indeed this was something that was suggested by participants in the semi-structured interview. Pedersen, Neighbors and LaBrie (2010) found that students overestimated alcohol consumption within their year group and in other years. Furthermore, students who estimated high within year perceived norms reported higher alcohol consumption than those with lower within year perceived norms (Pederson et al., 2010).

In the current study, participants frequently expressed the belief that the descriptive normative information would be significantly higher if it was year specific. Alcohol consumption of first year students in particular was perceived to be high and was often referred to by participants as evidence against the credibility of the normative feedback. In the Unitcheck programme the normative feedback is currently based on data from a large sample of students at various stages in their degree course. Given that overall alcohol consumption decreases as students progress through university (Bewick et al, 2008) it is likely that the normative information cited in Unitcheck is lower than if first or second year specific data had been used. Year specific normative data could still highlight student drinking misperceptions, but these are likely to be less pronounced.

Participants in the current study felt that year specific feedback would be more personally applicable. It may be beneficial to investigate whether year specific normative data is deemed by students to be more credible and is therefore more effective at addressing misperceptions regarding normative peer drinking. The appropriateness of this study would obviously depend on the suitability of the year specific normative data. The first year specific normative feedback in particular may be a problem if the actual normative alcohol consumption is above recommended limits. There are also practicalities to consider regarding the timely collection and dissemination of data. Fluctuations in alcohol consumption that occur throughout the academic year may be particularly problematic in providing same year specific normative feedback.

The saliency of the student comparison group

Participants explicitly recognised and commented on the use of a student comparison group in the feedback and felt that this was appropriate and relevant to

them as individuals. Suggested alternative normative comparison groups tended to be specific sub groups from within the University of Leeds, the most popular of which, student in the same year of study, has already been discussed. The majority of the participants considered themselves to be an average University of Leeds student, even after receiving the normative feedback. This suggests that "University of Leeds student" is an appropriate and salient comparison group; however, the saliency of the referent group could be further increased by using more proximal student sub groups in the normative feedback, this is discussed further below.

Sex specific normative comparison group

Normative feedback labelled as being same sex specific was used in the current study to increase the proximity of the normative referent for participants in study Group A. The relevance of the sex specific normative feedback was only explicitly commented upon by *female* participants in Group A. Previous research conducted in the USA has suggested that nearly 95% of male students perceive the typical student as male (Lewis & Neighbors, 2006). It may be that the male participants overlooked the fact that the feedback was same sex specific because that is what they expected to be presented with, although, in reality the female population is larger at the University of Leeds.

When commenting on the use of same sex specific feedback the female participants drew on biological and social factors to support its increased personal relevance. Five of the seven female participants in Group A explicitly stated that they felt the use of a female comparison group was more relevant to them personally; this opinion was often framed in terms of physical differences in drinking capacity. Two female participants in Group A questioned the use of same sex specific feedback on social grounds. One participant argued that the split was dictated by

social perceptions of women as being more vulnerable, to which she objected. The other felt that there were other, more personally salient, comparison groups than her sex which could have been used in the feedback. These qualitative findings seem to support Neighbours and Lewis' (2007) suggestion that the degree to which individuals identify with the referent group is important in how they respond to normative feedback. This is further supported by comments from the control group; one female participant identified drinking a similar amount to her "boy-mates", but more than her female friends as a way of understanding her feedback.

It appears from our study that the personal saliency of sex specific feedback is a complex issue. There is some indication from the qualitative data that providing feedback labelled as being same sex specific increases the relevance of that feedback for *female* students. However, in line with previous research, there is a minority who do not feel that this is the case and more closely associate themselves with other reference groups (Neighbours & Lewis, 2007). There is growing concern regarding increased alcohol consumption in females (Hibell et al., 2009) and it may be that media attention in this area is acting to further distort young women's perception of typical drinking behaviour in their same sex peers. The use of explicit, same sex specific feedback may be one way of challenging common social misperceptions; however, this is clearly an area in need of further exploration.

Consequences of drinking and the role of injunctive norms

There was qualitative evidence of permissive injunctive norms regarding acceptable drinking behaviour. Participants viewed their drinking behaviour and some of the associated negative consequences as permitted, if not inevitable in a university context. Categorised under the meta-theme inter-relationship of personal

code and context participants justified their drinking behaviour and related consequences as acceptable, at least in the short term.

The role of injunctive norms in student alcohol use has not been as widely investigated as that of descriptive norms (LaBrie, Hummer, Neighbors & Larimer, 2010; Prince & Carey, 2010). Similarly, student perceptions of alcohol related consequences have not been as thoroughly researched as descriptive norms regarding the frequency and quantity of alcohol consumption (Lewis, Neighbors, Geisner, Lee, Kilmer & Atkins, 2010). When considered from a motivational perspective, negative alcohol related consequences are a potentially significant factor in initiating changes in drinking behaviour (Lee, Geisner, Patrick & Neighbors, 2010). Recent research has begun to address both of these areas, specifically looking at student perceptions regarding the prevalence and acceptability of alcohol related consequences.

In line with misperceptions regarding student alcohol consumption, studies have found that students overestimate the number of negative consequences experienced by their peers and perceive others to have a more permissive attitude towards these consequences (DeMartini, Carey, Lao and Luciano, 2011; Lee, Geisner, Patrick & Neighbors, 2010). Research examining the relationship between negative alcohol consequences and perceived injunctive norms in referent groups of increasing proximity, found that perceived permissive injunctive norms in proximal others, particularly parents and close friends, are positively related to higher alcohol consumption and reported negative consequences experienced by students as a result of drinking (LaBrie, 2010; Neighbors et al., 2007; Neighbors, O'Connor, Lewis, Chawla, Lee & Fossos, 2008). Injunctive norms for more distal groups (e.g. the

typical student) are not as straight forward and may in fact be negatively associated with personal drinking (Neighbors, O'Connor et al., 2008).

Students may be less motivated to reduce negative alcohol related consequences due to the perceived social acceptability of these consequences (DeMartini et al., 2011). The appearance of acceptance may be upheld in part by the conspicuous nature of negative drinking consequences and the conversation that they prompt (Perkins, 1997). The research findings outlined above suggest that injunctive norms may be important in addressing negative drinking outcomes as something distinct from the volume of alcohol consumed (LaBrie et al., 2010). However, normative feedback on injunctive norms may have to be at the level of proximal referent groups, particularly close friends and parents.

There certainly appears to be some evidence of the role of injunctive norms in assessing alcohol related consequences in the qualitative data from this study. Participants described a code of acceptable behaviour based not only on their own standards, but also on what they perceived to be the wider social expectation of the typical student. Consequences including experiencing a hangover, behaving in an embarrassing way when drunk and missing class due to drinking were often commented on by participants as common occurrences, or an inevitable part of the student experience. However, not all drinking consequences were perceived to be acceptable. One drinking consequence that was consistently condemned was driving under the influence of alcohol. Even those few participants who admitted having done this were quick to criticize their behaviour. This could be perhaps interpreted as an example of a drinking behaviour that is perceived as being so socially unacceptable that it is not condoned, even within the student context.

It may be that a distinction can be made between acceptable and unacceptable drinking consequences and the way they interact with perceived injunctive norms and subsequent student drinking behaviour. Recent findings from a study by Lewis et al., (2010) suggest that perceived injunctive student norms for less severe drinking behaviours (e.g. playing drinking games, drinking to get drunk) are positively associated with alcohol consumption and related negative consequences. Whereas, perceived injunctive student norms for more severe drinking behaviours (e.g. drink driving, drinking alone) were negatively associated with alcohol consumption and related negative consequences. This finding was explained in terms of social desirability of the behaviour and the desire to conform or deviate from the norm (Lewis, Lee, Desai, Kilmer & Larimer, 2010). This association was moderated by identification with typical students of the same gender and personal drinking behaviour.

The relationship between injunctive norms and alcohol related negative consequences is not as predictable as that between descriptive norms and drinking behaviour and requires further investigation. Particular variables of interest include the level of proximity of the injunctive normative feedback, the severity of the drinking behaviour in question and the interaction with reported student alcohol use. Given that the Unitcheck programme draws on ideas from motivational interviewing it would also be beneficial to find out more about how injunctive feedback is received by students (Lewis et al., 2010). For example, does injunctive normative feedback emphasise discrepancies between the individual's ideal and their current situation, or is it perceived as being confrontational and judgemental? If the latter, the use of injunctive norms may not easily fit with the principles of motivational

interviewing incorporated into some social norms interventions (Miller & Rollnick, 1991).

Qualitative data from this study suggests that certain consequences including behaving in an embarrassing way, experiencing a hangover and missing class were generally accepted by participants as part of the typical student experience, whereas other consequences including driving under the influence of alcohol were not condoned. The perception that experiencing alcohol related negative consequences is the student norm may adversely impact on motivation to change drinking behaviour. Early research suggests that brief injunctive normative feedback regarding student drinking can reduce estimates of peer approval at the level of the typical student (Prince & Carey, 2010). Future interventions may benefit from challenging the perceived acceptability of negative alcohol related consequences, however the influence of injunctive norms needs to be better understood.

Challenging definitions

Participants challenged both the relevance and the credibility of normative feedback data by questioning formal definitions, namely recommended limits and binge drinking. It was common for participants to talk about binge drinking in particular in terms of individual intentions and undesirable behaviour, rather than the quantities of alcohol consumed. The term binge drinker was viewed negatively and participants tended to resist classifying their drinking in this way, one participant even found it offensive to be defined as a binge drinker. Similarly, participants felt that recommended drinking guidelines were unrealistic and irrelevant to student drinking.

Recent research into student definitions of binge drinking has found that students consider motivational factors and behavioural consequences, in addition to

the quantity of alcohol consumed (Bonar, Young, Hoffmann, Gumber, Cummings, Pavlick & Rosenberg, 2012; Cooke, French & Sniehotta, 2010). This may be significant to the way in which students receive normative feedback. There was evidence in the current study to suggest that the personal relevance of the normative data is undermined by the perceived low applicability of the standards used. Social norms interventions need to consider in what way standard definitions and guidelines are used in the feedback and how they can be made more relevant to students.

Change

The ultimate aim of the social norms approach is to correct student misperceptions regarding alcohol consumption resulting in changes in personal drinking behaviour. References to change in the qualitative data tended to be ambivalent, it was common for participants to identify the need to change, but deny the capability to put this into practice. Factors supporting change were largely context driven, either occurring as a result of changes in role and responsibility, or as a result of an adverse negative event.

There was evidence of a close relationship between personal value judgements regarding acceptable alcohol consumption and change. Emerging dissonance in the way in which participants viewed their alcohol consumption was largely overcome by framing the behaviour as a short term and acceptable part of university life. The possible role of injunctive norms regarding negative alcohol related consequences has been discussed above.

In the current study the majority of participants did not feel that they would change their drinking behaviour as a result of completing the Unitcheck programme. However, previous research has found that reductions in student weekly alcohol consumption can in fact occur contrary to participant predictions (Bewick et al.,

2010). Of note in this study was the number of participants who stated that the way in which they think about alcohol has changed as a result of completing Unitcheck. Both social norms theory and motivational interviewing propose that changes in the way individuals think about their alcohol use (either relative to peers, or personal goals) precede behavioural change (Bosari & Carey, 2001; Miller & Rollnick, 1991). It seems plausible that reported changes in thinking may well precede changes in alcohol consumption, although this has not been explicitly tested in this study.

Implications of the findings

There are a number of findings from this study that could inform the future development of web-based social norms alcohol interventions for students.

First, findings from this study indicate that students actively engage with the Unitcheck programme, relating the personalised feedback to their own personal experience and perceptions. As part of this cognitive appraisal the normative feedback information is noted and recalled by participants, as is the normative comparison group. This finding supports the continued use of personalised normative feedback information in Web-based student alcohol interventions.

Second, the primary emotional and cognitive responses to the normative feedback are surprise and disbelief. This was particularly pronounced in participants reporting drinking at hazardous or harmful levels in the previous week. This reaction appears to be malleable and tended to fluctuate throughout the course of the interview following the presentation of the feedback. Participants identified a number of factors that increase the credibility of the feedback, these included: professional presentation and clear referencing of the source of the feedback data; supportive statistics on prevalence and health related consequences; including comments from health professionals and providing feedback specific to year of

study. The inclusion, or emphasis, of the above in Web-based alcohol interventions may add to the believability and subsequent impact of the normative feedback information on student misperceptions and drinking behaviour.

Third, the use of a normative comparison group that is labelled as being same sex specific was noted by female participants and highlighted as a positive addition. Participants commented on the increased relevance of using a female comparison group due to differences in physiology and styles of drinking between men and women. The extent to which the participant identifies with same sex peers appears to be important; in some cases alternative comparison groups may be more personally salient. Future development should therefore continue to evaluate the use of sex specific normative feedback information, particularly for female students.

Fourth, excessive alcohol consumption and the associated negative consequences are perceived as an accepted and expected part of the student lifestyle. There appears to be a strong role for injunctive norms in determining socially permitted drinking behaviour, these operate at the level of the individual, their student peers and more widely at a societal level. Students perceive alcohol consumption and its consequences to be an accepted part of a wider, unhealthy student lifestyle. Furthermore, there is an assumption that as they progress through university and begin their working lives this drinking pattern will automatically change. The inclusion of injunctive norms regarding the acceptability of negative consequences as a result of drinking in social norms interventions may help to dispel student misperceptions. However, more research is required to better understand how the proximity of the normative referent group used impacts on how injunctive messages are received by participants. The way in which injunctive norms are worded and presented also requires further careful consideration.

Fifth, as a result of completing the Unitcheck programme participants reported a change in the way they think about their personal alcohol consumption, but did not predict an imminent change in their drinking behaviour. Factors influencing alcohol consumption in the short term were largely contextual e.g. current workload (academic and paid employment) and financial circumstances. As mentioned in the previous point participants perceived excessive drinking to be part of the student lifestyle and predicted that they would automatically reduce their alcohol consumption when they were no longer students. In keeping with previous research, reported changes in the perception of personal alcohol consumption are predicted to precede changes in behaviour. This was not explicitly tested in this study, more information on long term patterns of alcohol consumption may be an important future addition to social norms research.

Areas for further study

Findings from this study raise a number of questions and possible areas for future research. In this study there was no follow up with participants beyond the face-to-face interview. Social norms research may benefit from longitudinal research investigating how individual student perceptions of the normative data change over time and how this relates to changes in drinking behaviour.

The participants in this study indicated that receiving year of study specific feedback would be particularly personally relevant. Taking into consideration the fact that year specific normative feedback may create less pronounced misperceptions it would be interesting to contrast the impact of these with those of the generic student normative feedback currently used in Unitcheck. It may be that, despite the smaller misperception, the year specific normative feedback is perceived by students to be more credible and is therefore more effective.

It would also be potentially valuable to investigate the impact of including injunctive normative information in Unitcheck, specifically around acceptable alcohol related student behaviour. Qualitative data from this study indicated that negative drinking consequences are almost considered synonymous with the student identity. Working with injunctive norms may help to reduce the perceived acceptability of experiencing negative drinking consequences and increase motivation to change.

Strengths and limitations of the methods

The focus of this study was to understand more about participant responses to the personalised normative feedback presented in a study version of Unitcheck. Strengths of this design include its unique use of the think-aloud technique to draw data directly from the reaction of participants to the personalised normative feedback as it was presented. To account for the difficulty in predicting the quality of the resulting data, a semi-structured interview followed the think-aloud procedure allowing participants to elaborate on aspects of their response. The methods used produced rich, valid data that appropriately met the research aims of this study.

This study explored University of Leeds student responses to one specific Web-based alcohol intervention, Unitcheck. Whilst this was useful and appropriate, it does place some limitations on the ability to generalise findings to other student populations and Web-based alcohol social norms interventions. However, when considered in the context of existing literature, findings from this study support and build on previous research.

As regards the study sample there were a larger proportion of female than male participants. This is typical of similar studies and reflects the student population at the University of Leeds. Due to fluctuations in student drinking

between the recruitment survey and the interviews four of the 21 participants reported drinking within recommended limits at the time of the study; three of these were randomly allocated to Group B. Overall Group B reported lower alcohol consumption over the previous week than Group A, however, the difference between the two groups was not statistically significant. All of the data from the current study was collected in the first academic term and does not reflect changes in alcohol consumption over the academic year.

Methodological limitations include the presence of the researcher throughout the think-aloud task. This was necessary in order to prompt the participant when required and ensure that the task ran smoothly. It is reasonable to assume that the presence of the interviewer may have affected participant responses; the most likely outcome is that the participants worked through Unitcheck more conscientiously than they might otherwise have done. Observations at the time of the study were that this was sometimes the case, but there were also participants who were not particularly thorough in completing Unitcheck. It is also apparent from the content of the qualitative data that participants felt comfortable questioning the quality of the normative feedback and suggesting areas for improvement.

Conclusions

This qualitative study provided a rare insight into how students interact with a Wed-based social norms intervention. It confirmed that students are willing to engage with the normative feedback information and relate it to their own perceptions and experience. It also clarified some of the challenges faced by Web-based social norms interventions, particularly in overcoming student scepticism regarding the credibility of the normative data. Finally, the current study has highlighted some areas for future research including the potential role of injunctive

norms and the possible use of same sex, or same year specific normative referent groups.

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APPENDICES

Appendix 1: Letter confirming ethical approval

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UNIVERSITY OF LEEDS

Miss Sarah Marley
DClinPsy Student
c/o Bridgette Bewick
Leeds Institute of Health Sciences
University of Leeds
Charles Thakrah Building
101 Clarendon Road
LEEDS LS2 9LJ

08 April 2011

Dear Sarah

Re ref no: **HSLTLM/10/016**

Title: **Student responses to an online alcohol resource**

I am pleased to inform you that the above research application has been reviewed by the Leeds Institute of Health Sciences and Leeds Institute of Genetics, Health and Therapeutics and Leeds Institute of Molecular Medicine (LIHS/LIGHT/LIMM) joint ethics committee and following receipt of the amendments requested, I can confirm a favourable ethical opinion on the basis described in the application form, protocol and supporting documentation as submitted at date of this letter.

Please notify the committee if you intend to make any amendments to the original research as submitted at date of this approval. This includes recruitment methodology and all changes must be ethically approved prior to implementation. Please contact the Faculty Research Ethics and Governance Administrator for further information (r.e.desouza@leeds.ac.uk)

Ethical approval does not infer you have the right of access to any member of staff or student or documents and the premises of the University of Leeds. Nor does it imply any right of access to the premises of any other organisation, including clinical areas. The committee takes no responsibility for you gaining access to staff, students and/or premises prior to, during or following your research activities.

Please note: You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, and other documents relating to the study. This should be kept in your study file, which should be readily available for audit purposes. You will be given a two week notice period if your project is to be audited.

It is our policy to remind everyone that it is your responsibility to comply with Health and Safety, Data Protection and any other legal and/or professional guidelines there may be.

I wish you every success with the project.

Yours sincerely

Laura Stroud

Professor Alastair Hay/Mrs Laura Stroud/Dr David Jayne
Chairs, LIHS/LIGHT/LIMM REC

Appendix 2: Bristol Online Survey invitation email

Are you a first year undergraduate student aged between 18-21 years and living in University Halls of residences?

Yes …

Are you interested in winning one of three printer credit prizes (first prize printer credits to value of £20)?

Yes …

Can you spare 10 minutes to answer a short survey on your own consumption of alcohol? (You do not need to drink alcohol to complete the survey and be eligible to enter the prize draw).

Yes …

We are looking for volunteers to take part in a study, the aim is to find out more about students' responses to an online alcohol resource.

If you are aged 18-21 years old, currently in the first year of your Undergraduate degree and are interested in taking part please click on the link below and complete the brief survey. The survey asks you about how much alcohol you have consumed in the past week and should not take longer than 10 minutes to complete. Everyone who completes the survey will be included in a prize draw – 1st prize £20 printer credits, 2nd and 3rd prize £10 printer credits.

https://www.survey.leeds.ac.uk/marley2

This study is being carried out by the Leeds Institute of Health Sciences. If you have any questions regarding this study please contact Sarah Marley at umslm@leeds.ac.uk.

Thank you.

Appendix 3: Bristol Online Survey information sheet

Information Sheet – Stage 1

Student responses to an online alcohol resource

You are being invited to take part in a research project

Please take time to read the following information carefully to help you to decide whether or not you would like to participate in the study. It is important to understand why the research is being done and what it will involve.

What is the purpose of the study?

The aim of the study is to get student feedback on an online alcohol resource and the information it provides. It is hoped that the results from the study feedback can be used to improve the website.

Why have I been invited to take part in the study?

All University of Leeds students aged 18-21 years old, in the first year of their Undergraduate degree, living in university Halls of residence, have been invited to complete a brief online survey regarding their alcohol consumption.

What will be involved if I agree to take part in the study?

The study involves two stages. This is the first stage of the study. During the first stage you are invited to complete an online survey about your alcohol consumption, (you do not need to drink alcohol to be able to complete the survey). If you decide that you would like to receive information about the second stage of the study you will need to complete the relevant questions in the online survey. If you agree to be contacted about the second stage of the study you may be invited to take part in the next stage of the study. **Not everyone who completes the online survey will be invited to continue in the study.**

If you are selected to participate in the next stage of the study you will be sent an email providing you with more information about the second stage. At this time you will be asked to provide details of your name and contact telephone number. This contact information will be used by Sarah Marley to arrange a face to face interview with you. At the interview you will be asked to work through and comment on an online alcohol resource.

Do I have to take part in the study?

Taking part in this study is voluntary. If you do decide to take part you can withdraw from the study at any time without giving any reason. Any decision to withdraw will not affect your studies at the University of Leeds. All students who complete the online survey will be entered into the prize draw, regardless of whether

or not they consent to further participation in the study and regardless of whether or not they drink alcohol.

What will happen to the information obtained in the study?

Any data obtained in the study will be treated as confidential and stored securely as is required under the data protection act. Any contact details you provide will be stored separately from your survey responses. If you agree to be interviewed Sarah Marley will use a number to identify your responses. Only the researchers will know who the numbers relate to.

What will happen to the results of the study?

The information from the study will be used in a doctoral thesis. Part of the research may also be presented at conferences, workshops and published in academic journals. As part of the online survey you will be asked if you would like to receive a brief summary of the results once they become available.

Who has reviewed the study?

This study has been reviewed by the Institute of Health Sciences Ethics Committee, University of Leeds.

How do I take part?

You can take part in the study by completing this online survey.

Support information

If you have been affected by any part of this information, or would like to find out more about safe drinking guidelines, you might find the following agencies and websites helpful:

Leeds Student Medical Practice: 0113 295 4488
Leeds University Nightline Listening: 0113 380 1381
Leeds Addiction Dependency Solutions: 0113 247 0111
http://www.alcoholanddrugservices.org.uk/centres/leeds.html
Leeds Student Counselling Centre http: //www.leeds.ac.uk/studentcounselling/
Drinkline (confidential national alcohol helpline): 0800 917 8282

Thank you for reading this information.

If you have any questions please email Sarah Marley at umslm@leeds.ac.uk.

Bridgette Bewick
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University of Leeds
B.M.Bewick@leeds.ac.uk

Hilary Bekker
Senior lecturer
University of Leeds

Sarah Marley
Doctoral Student
University of Leeds
umslm@leeds.ac.uk

Appendix 4: Email inviting participants to take part in the one-to-one interview

Dear

You have been selected to take part in a study.

You recently completed a short survey about your alcohol consumption and indicated that you might be willing to participate further in the research study. Based on your survey responses we would like to invite you to attend a face to face interview lasting approximately 1 hour. We are interested in getting student feedback on an online alcohol resource and the information it provides.

Please read the attached information sheet for more details.

Everyone who attends an interview will be awarded University printing credits to the value of £5.

If you would like to take part in this study please reply to this email with your name, availability and a contact telephone number within 2 weeks. We will then phone you and arrange an interview for a time that is convenient to you.

If you have any questions regarding this study please contact Sarah Marley at umslm@leeds.ac.uk.

Thank you.

Appendix 5: Interview information sheet

Student responses to an online alcohol resource

Information Sheet – Stage 2

You are being invited to take part in a research project.

Please take time to read the following information carefully to help you to decide whether or not you would like to participate in the study. It is important to understand why the research is being done and what it will involve.

What is the purpose of the study?

The aim of the study is to get student feedback on an online alcohol resource and the information it provides. It is hoped that this feedback can be used to improve the website.

Why have I been invited to take part in the study?

You recently completed an online alcohol survey and indicated that you might be available to take part in further research. Based on the information that you gave, you are being invited to take part in the second stage of the study.

What will be involved if I agree to take part in the study?

If you decide to take part in the second stage of the study the researcher, Sarah Marley, will contact you by phone to arrange a face to face interview. The interviews will take place in a private room on the University of Leeds main campus. In the interview you will be asked to work through an online alcohol resource while speaking your thoughts out loud. You will then be asked some questions about the website and the information it provides. The interview will be audio-tape recorded. The interview should last no longer than one hour.

Do I have to take part in the study?

Taking part in the second stage of this study is voluntary. If you do decide to take part you will be asked to complete an electronic consent form. You can withdraw from the study at any time without giving any reason. Your decision will not affect your studies at the University of Leeds.

What will happen to the information obtained in the study?

Any data obtained in the study will be treated as confidential and stored securely as is required under the data protection act. Audio recordings will be transcribed for analysis and any details that may identify you will be removed from the transcript. Your interview will be link-anonymised, this means Sarah Marley will use a number to identify your responses. Only the researchers will know who the numbers relate to.

What will happen to the results of the study?

The information from the study will be used in a doctoral thesis. Part of the research may also be presented at conferences, workshop and published in academic journals. The anonymised transcripts will be kept for future research purposes by the chief investigator, Dr Bridgette Bewick. Sarah Marley will send you a brief summary of the results the study when the research is completed.

Who has reviewed the study?

This study has been reviewed by the Institute of Health Sciences Ethics Committee, University of Leeds.

How do I take part?

If you wish to participate simply reply to this email providing a name and contact telephone number and Sarah Marley will contact you to arrange a face to face meeting.

Support information

If you have been affected by any part of this information, or would like to find out more about safe drinking guidelines, you might find the following agencies and websites helpful:

Leeds Student Medical Practice: 0113 295 4488
Leeds University Nightline Listening: 0113 380 1381
Leeds Addiction Dependency Solutions: 0113 247 0111
http://www.alcoholanddrugservices.org.uk/centres/leeds.html
Leeds Student Counselling Centre http: //www.leeds.ac.uk/studentcounselling/
Drinkline (confidential national alcohol helpline): 0800 917 8282

Thank you for reading this information.

If you have any questions please email Sarah Marley at umslm@leeds.ac.uk.

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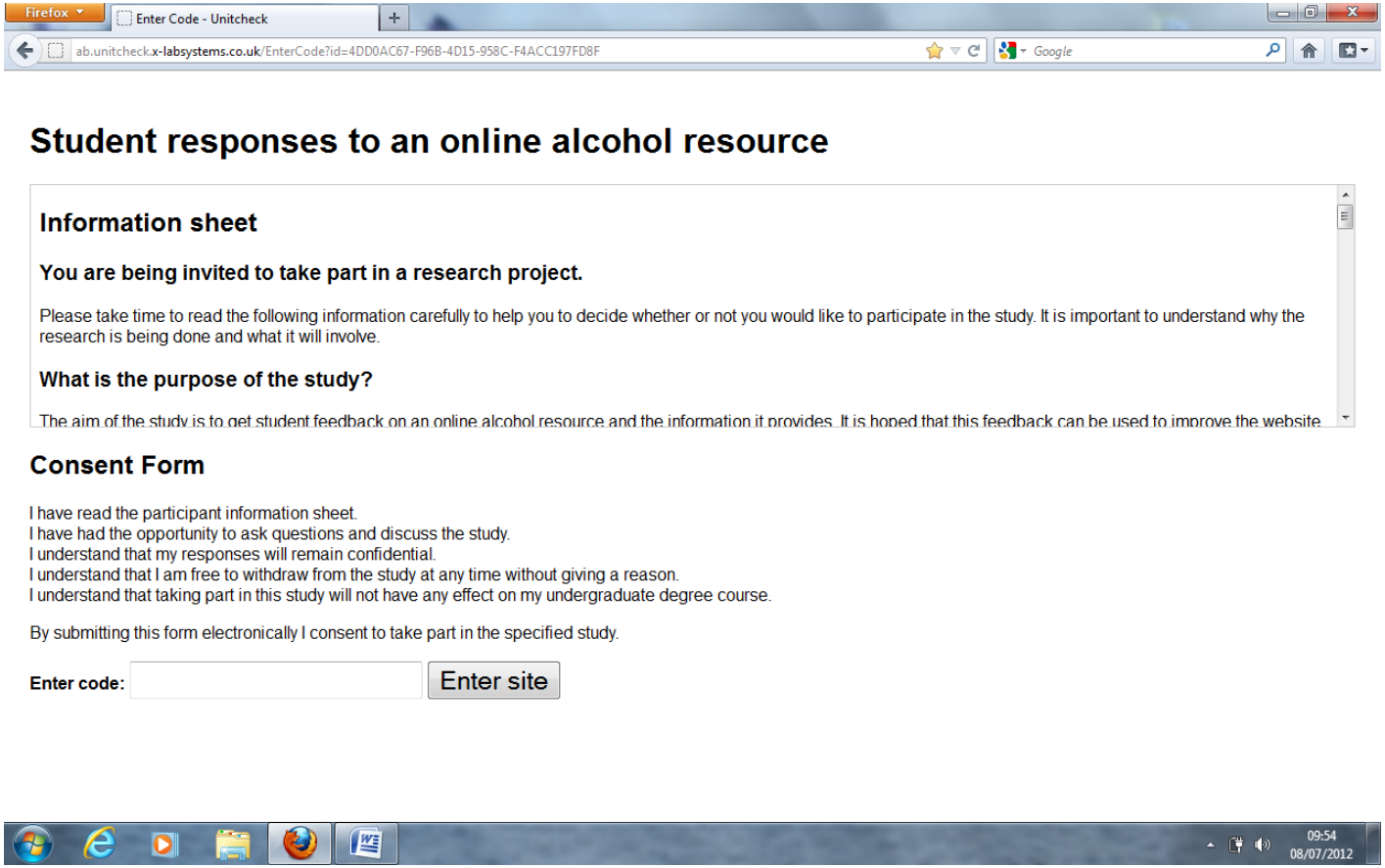
Appendix 6: Think-aloud instructions

Today I am going to ask you to work through an online alcohol resource called Unitcheck. Have you ever looked at this programme before? It shouldn't take more than 20 minutes to work through the programme. This study is interested in what you think while you are progressing through Unitcheck. To try and capture this I would like you to think your thoughts aloud while you work through the programme. This means speaking out loud everything you are thinking as you are going through the programme. You don't need to worry about speaking in sentences, or explaining your thoughts, I just want you to say out loud whatever thoughts you might have. I know this is quite an unusual thing to do, so if you go quiet I will remind you to continue to think-aloud. Please try to speak clearly and keep talking right up until the end of the programme. When you have completed Unitcheck I will ask you a few questions about how you found it. Do you understand what I want you to do? Do you have any questions?

Because it's quite an unusual thing to do I thought we could try a warm up exercise. I have loaded up the Argos website and I would like you to spend a few minutes finding a kettle for me. It can be any kind of kettle, but I want you to speak your thoughts aloud whilst you do it. This isn't part of the interview; it's just to practice thinking aloud.

Thank you, hopefully you've got the hang of it now. I want you to work through Unitcheck now; it will start by asking you to enter the code in this envelope. Just complete the programme as if I am not here, I won't be able to answer any questions. Just work through the programme as you think best. I will switch the recorder on now, please start when you are ready. Just remember to keep thinking your thoughts aloud.

Appendix 7: Front screen of the study version of Unitcheck



Appendix 8: Interview guide

Interview Guide 2

Thank you. How did you find that?
Now I am going to ask you a few questions about the feedback information you were given.

Recall

What can you remember from the feedback information?

How would you summarise the feedback information?

Was there any part of the feedback information that particularly stands out for you?

What do you think the main message is?

What was your immediate reaction to this feedback information?

Did you notice the feedback in red?

How did the feedback information presented in red make you feel?

How did the feedback information presented in green make you feel?

Believable

Strongly disagree

Strongly agree

The information was believable: 1 2 3 4 5 6 7

What aspect of the information did you feel was believable? Why?

Was there any part of the information that you did not find as believable?

Which bit and why?

What was it about the information that you didn't believe?

What would have made the information more believable?

Relevance

The information was personally relevant/ applied to me: (1-7)

What part of the information felt most relevant?

In what way was it particularly relevant? –emotional reaction?

Was there any part of the information that did not seem relevant? Why not?

What would have made it feel more relevant?

Comparison group

The feedback includes information on other peoples drinking – can you recall who the others were?

What was your reaction to this comparison?

Did you feel the comparison was accurate?

The comparison group was personally relevant: (1-7)

Would you class yourself as the average [male/female] University of Leeds student?

Would a different comparison group have felt more personally relevant? If so what group and why?

Appendix 9: Likert rating scale (visual aid used in the interview)

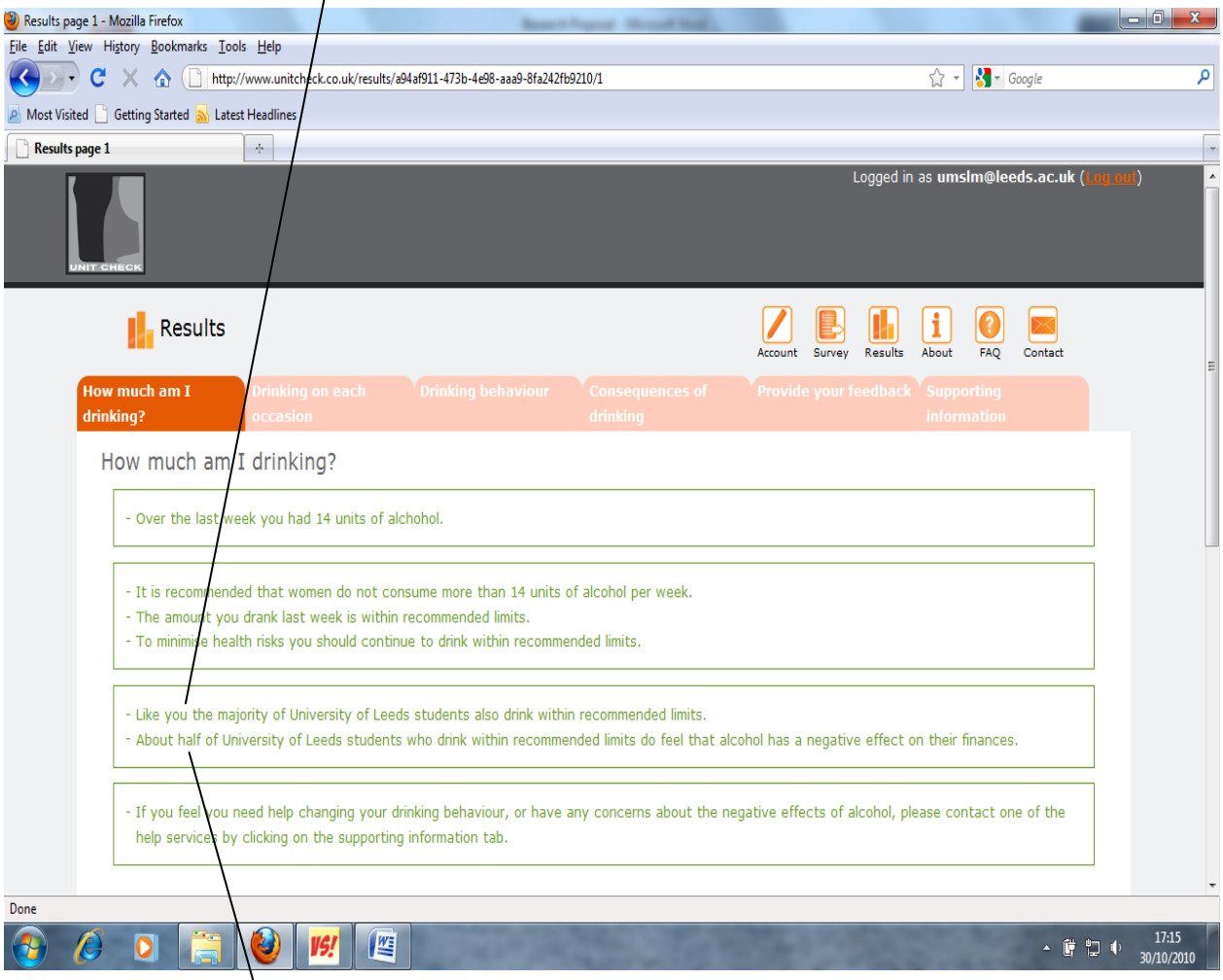
Strongly Disagree Strongly Agree

1 2 3 4 5 6 7

Appendix 10: Alterations to the study version of Unitcheck

Results section page 1

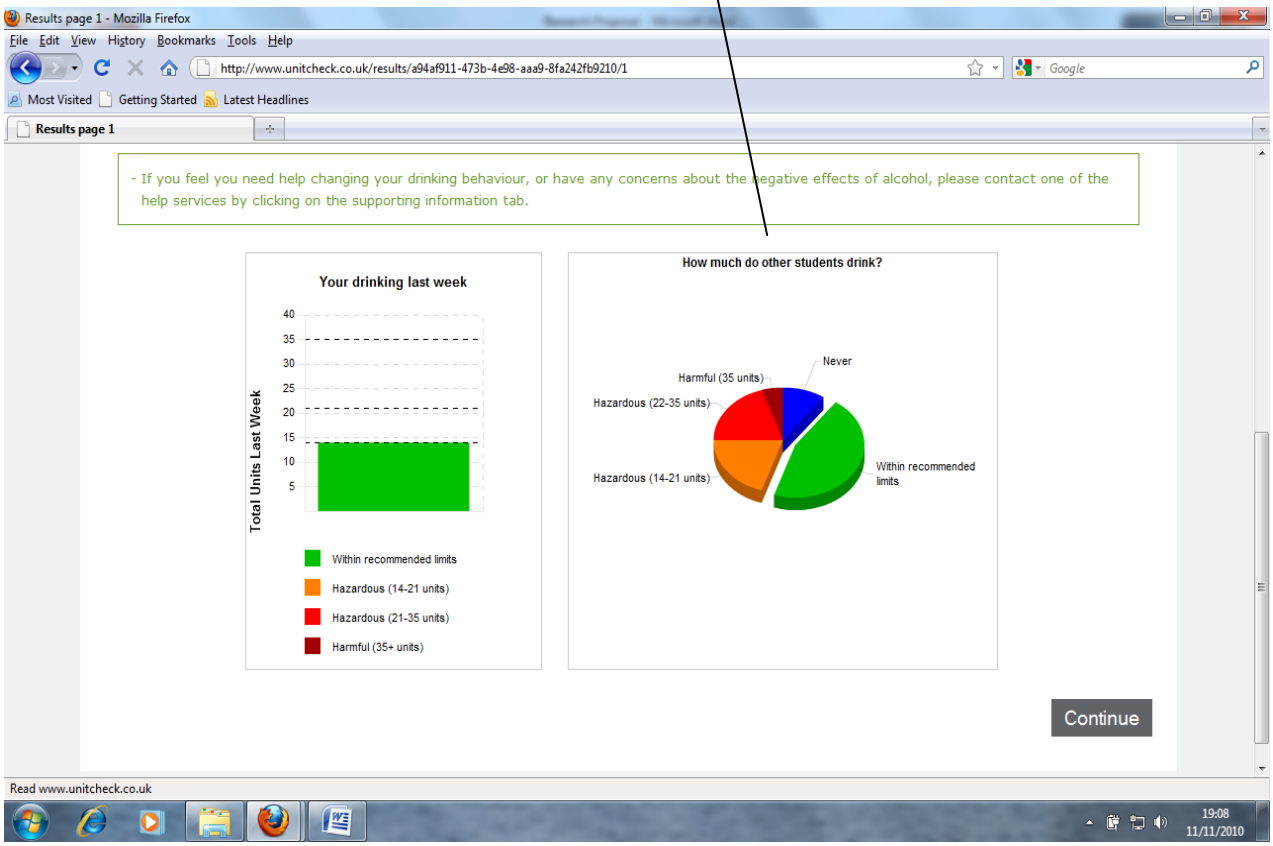
1) "Like you the majority of University of Leeds students also drink within recommended limits"
2) "Like you the majority of female/male University of Leeds students also drink within recommended limits"



1) "About half of University of Leeds students who drink within recommended limits do feel that alcohol has a negative effect on their finances"
2) "About half of female/male University of Leeds students who drink within recommended limits do feel that alcohol has a negative effect on their finances"

Results page 1 continued...

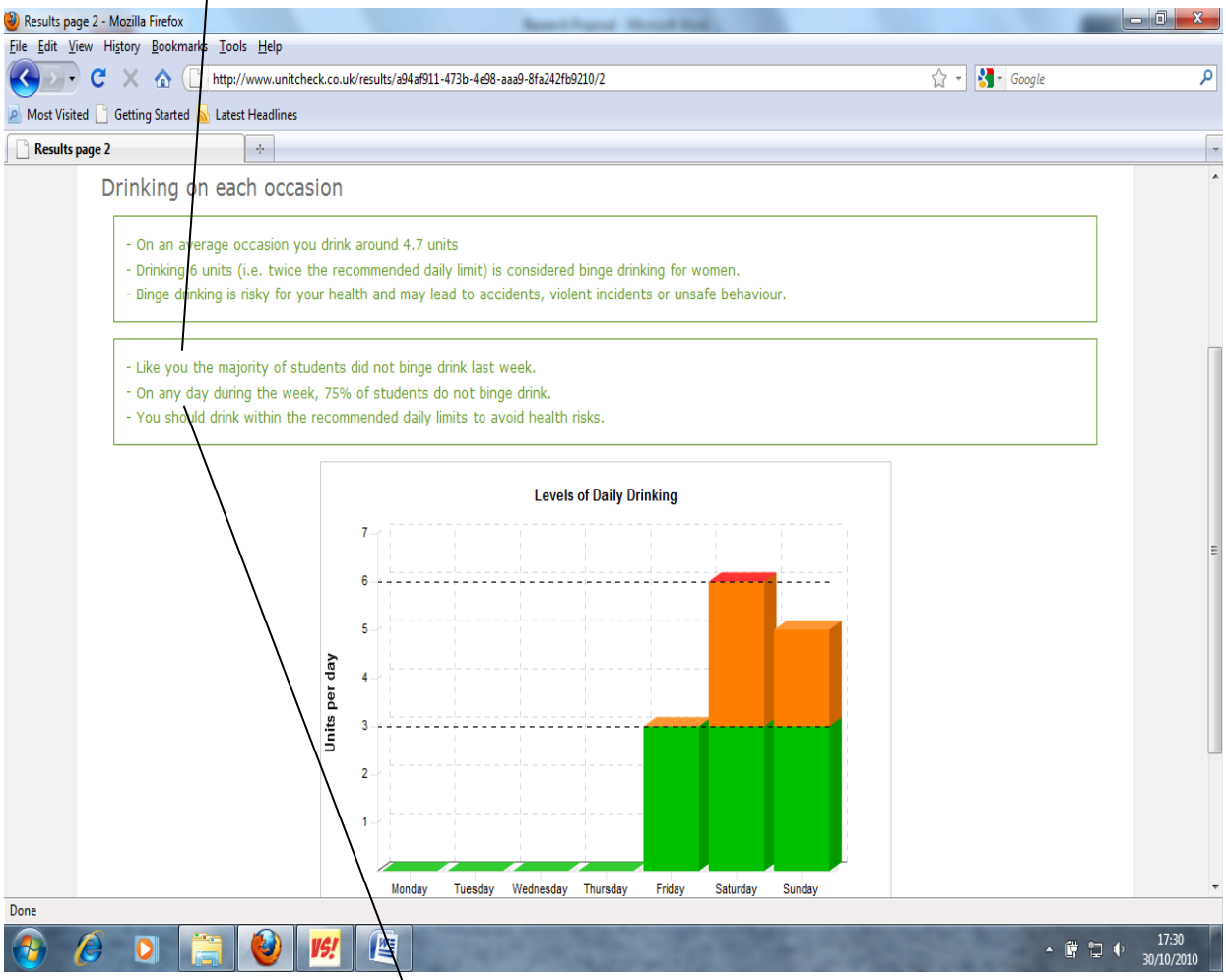
1) How much do other students drink?
2) How much do other female/male students drink?



Results page 2

1) "Like you the majority of students did not binge drink last week "

2) "Like you the majority of female/male students did not binge drink last week"



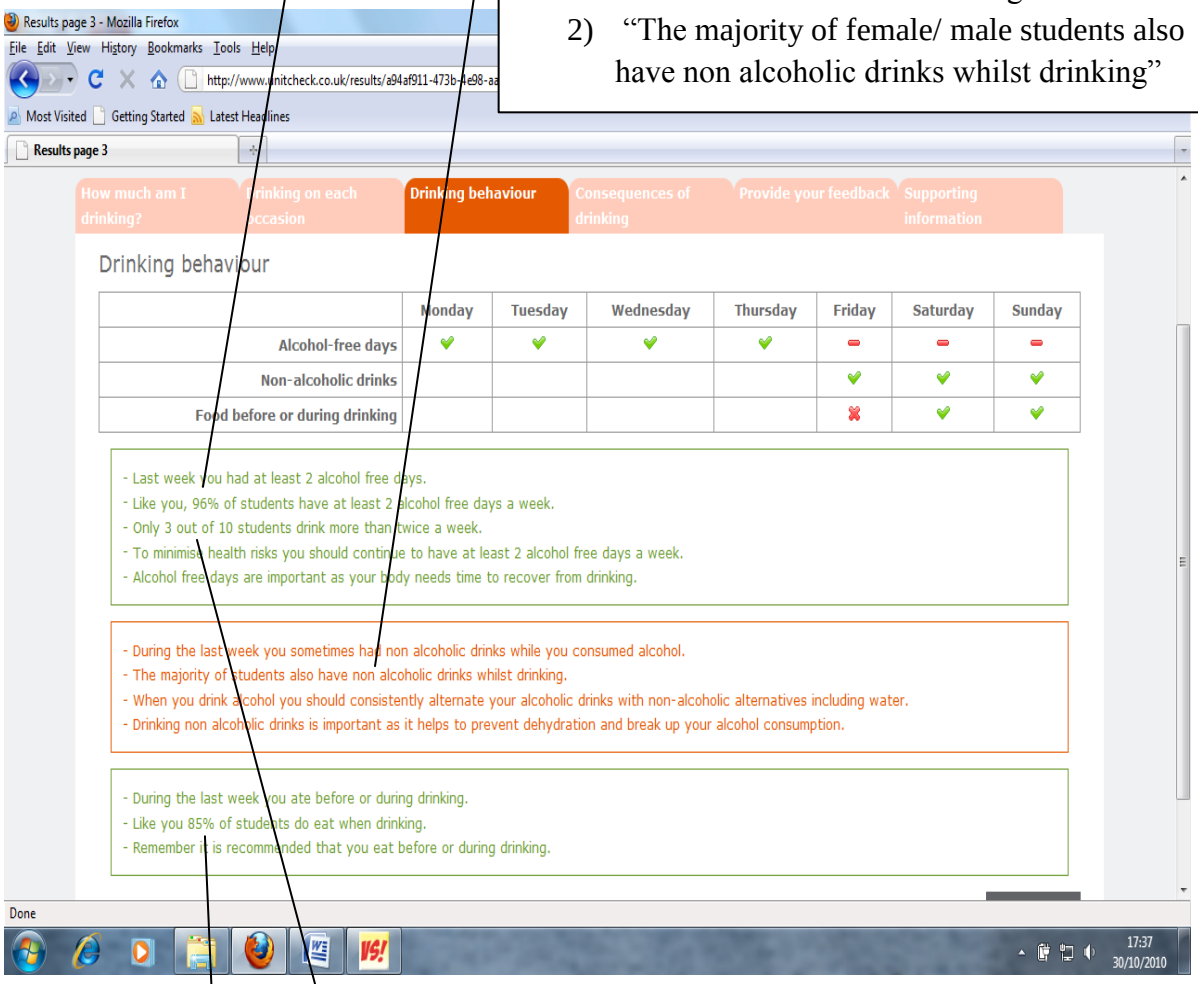
1) "On any day during the week, 75% of students do not binge drink"

2) "On any day during the week, 75% of female/male students do not binge drink"

Results page 3

1) "Like you, 96% of students have at least two alcohol free days a week"
2) "Like you, 96% of female/male students have at least two alcohol free days a week"

1) "The majority of students also have non alcoholic drinks whilst drinking"
2) "The majority of female/ male students also have non alcoholic drinks whilst drinking"

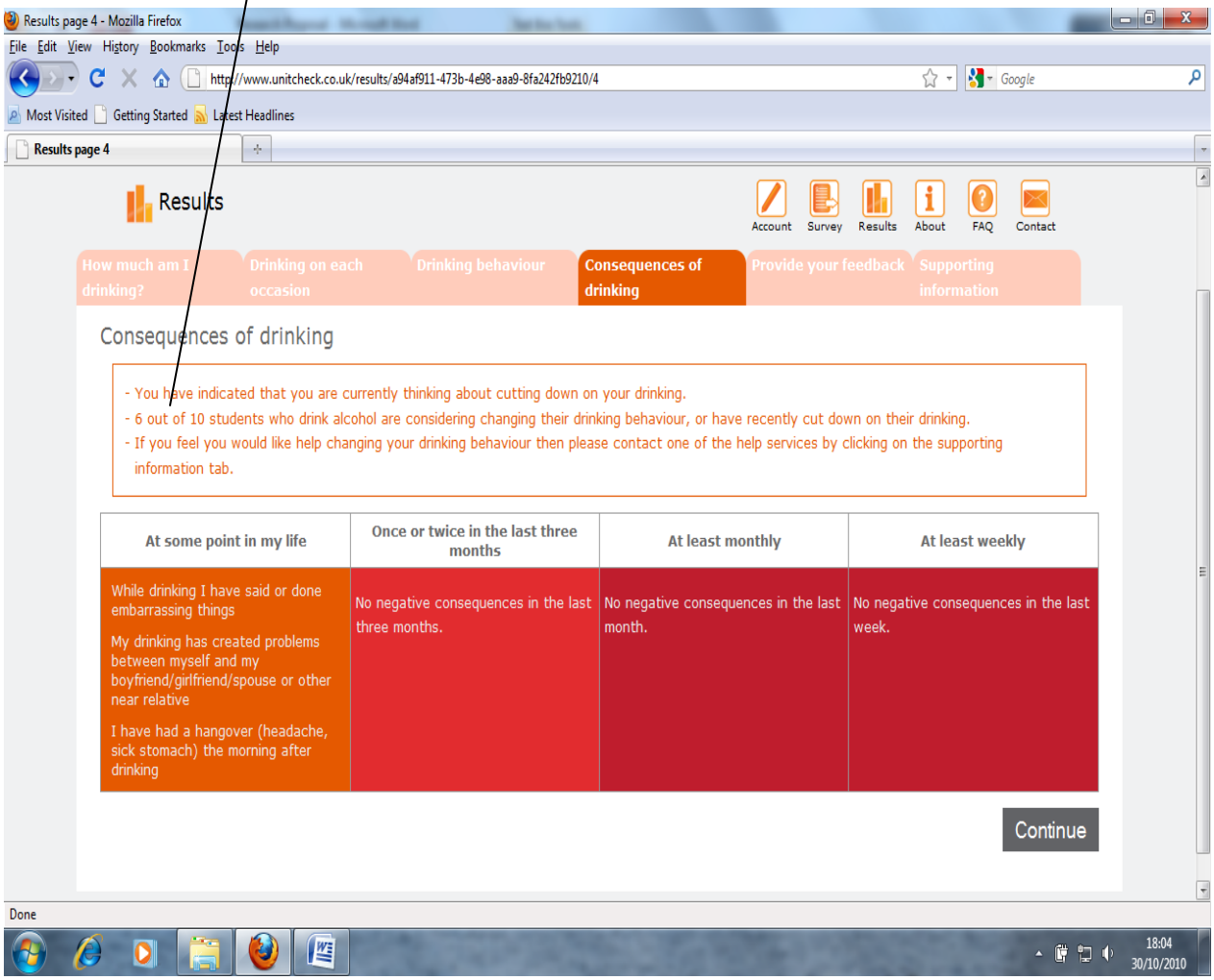


1) "Only 3 out of 10 students drink more than twice a week"
2) "Only 3 out of 10 female/male students drink more than twice a week "

1) "Like you 85% of students do eat when drinking"
2) "Like you 85% of female/male students do eat when drinking"

Results page 4

1) "6 out of 10 students who drink alcohol are considering changing their drinking behaviour"
2) "6 out of 10 female/ male students who drink alcohol are considering changing their drinking behaviour"



Appendix 11: Item list

Miscellaneous

1 Misc – reading from Unitcheck
2 Misc – registration (including demographics)
3 Misc – Query (including: registration, Unitcheck audience, Unitcheck input, study procedure, aim of study)
10 Misc - Comment on the Think Aloud method, getting distracted
11 Misc statement (including: comments on equipment, response to pop up box on laptop, irrelevant info)
15 Misc - Response to interviewer (including queries regarding questions)
Ratings
18 Believability rating
19 Believability rating, normative feedback
20 Rating for personal relevance
21 Rating for personal relevance, normative feedback

Information/evaluation – Answering Unitcheck

22 Answering the question, neutral.
23 Answering the question, negative self evaluation.
24 Answering the question, positive self evaluation.
25 Answering the question, ambiguous self evaluation.
35 Answering question, indecision (understand question, but can't decide on answer)
36 Answering question, query about meaning (difficulty in interpreting meaning of question)
37 Answering the question, difficult to remember (e.g. drink diary)

Response to personalised feedback

Relation of self to guidelines
45 Negative self evaluation, contextualising personal consumption in terms of recommended guidelines (units).
47 Negative self evaluation, frequency.
48 Negative self evaluation in response to feedback, unspecified
50 Positive self evaluation, response to feedback.
Challenging/questioning the feedback
51 Discomfort/disbelief of being in the minority.
54 Questioning the composition of the normative comparison group.
55 Questioning the provenance of the normative feedback data (stats on other student drinking)
72 Limitation of normative data, data collection
56 Questioning the agenda behind the normative data.
57 Acknowledging the limits of own experience (re. others drinking)
59 Active consideration of the feedback
60 Questioning the normative feedback, comparison with personal beliefs / perception of peer drinking
62 Stated expectation of student drinking.
75 Data is wrong/ has been incorrectly inputted by participant

Recall of normative feedback
63 Spontaneous recall of normative feedback (correct/incorrect)
64 Do / do not recall normative comparison group.
66 Prompted recall of normative feedback (correct/incorrect)
Expressed affect (in response to feedback)
67 Comment on normative feedback, unexpected
68 Emotional reaction to normative feedback (shocking, surprising).
69 Comment on response to feedback, defensive.
73 Normative feedback hard to believe
74 Disbelief of normative feedback.
Agreement/ ambiguous
77 Reading feedback, (neutral)
78 Reading feedback, with vocalisations indicating agreement.
79 Reading recommendations, agreement

Negative evaluation in response to feedback overall

112 Negative self evaluation in terms of negative life events
113 Negative self evaluation, drinking behaviour associated with immaturity
114 Negative self evaluation, drinking behaviour "stupid"
115 Drinking behaviour immature, not acceptable at his/her age
116 Negative self evaluation, relationship with alcohol, addictive
117 Negative self evaluation, comment on personal drinking style
118 Negative evaluation of drinking behaviour, new perspective

Comparison

58 Negative self evaluation, response to normative feedback
65 Personal feedback challenging perception of own drinking, amount (need to reconsider).
103 Comparison with others, same/representative
104 Assumption that the participant is the average (across the Uni)
85 Comparison with others (unknown), possible consequences (drinking on a morning)
89 Comparison with others, specific subgroup (drink more)
91 Expectations of a specific subgroup (e.g. Freshers)
82 Negative self evaluation, contextualising personal consumption in terms of others.
83 (In response to feedback), negative self evaluation in comparison to others, being in the minority is not desirable.
92 Comparison with others, specific subgroup (drink less)
95 Comparison with specific close other, (drinks less)
86 Comparison with others, (undesirable) drinking behaviour
87 Sources drawn on for estimate of peer drinking, experience of friendship group
88 Sources drawn on for estimate of peer drinking, feedback from friendship group
96 Comparison with others, friends, (drink more)
97 Comparison with others, friends (drink the same)
98 Comparison with others, expected pattern of drinking across Uni
99 Comparison with others, student vs non student.

100 Comparison with others, temporal (start of year)
101 Difficult to estimate other student drinking without personal experience as a point of reference.
105 Comparison with (own) previous behaviour
106 Positive self evaluation, comparison with others (majority)
107 Comparison with others plus negative self evaluation (minority)
108 Comparison of drinking behaviour with recommended limits
110 Comparison with others, level of responsibility
111 Comment on reputation of Leeds students in comparison to other Universities

Consequences

No negative consequences
119 Potential negative consequences of current behaviour
Negative consequences stated, neutral
Negative consequences acknowledged, negative self evaluation
140 Negative consequences acknowledged, active choice
129 Negative consequences, experience of others (known)
44 Positive self evaluation in response to absence of harm.
34 Statement of event, no further explanation of link to alcohol.
43 Consequences can be difficult to connect to drinking, link between consumption and grades/quality of work too far removed.
120 Some negative consequences are more significant than others (life>health)
121 Exposure to other risks e.g. smoking reduces the relevance and impact of feedback.
122 Giving own alternative explanations for negative consequences e.g. smoking, laziness.
133 Possible positives to cutting down alcohol consumption
136 Compensatory actions, neutralising consequences (e.g. working therefore avoiding financial difficulties).
138 Positives of drinking alcohol in moderation (social, fun, enjoyment)

Personal standards/ values

141 Personal standards / values around acceptable and unacceptable drinking behaviour
142 Personal standards/ values, distinguishing between levels of obligation (e.g. it is ok to miss lectures but not tutorials)
143 Personal standards/limits, levels of consequence.
144 Challenging definitions, comparison with others/commonality of behaviour
145 Personal definitions/ expectations e.g. binge drinking = purposefully drinking until you are drunk.
147 Personal limits to behaviour, comparison with worse possible behaviour
148 Change in circumstances has historically altered their evaluation of behaviour.
149 Social perception of alcohol as not being dangerous

Context of drinking

151 Context of drinking, social/special occasion
152 Reason for drinking, affect (e.g. stress, boredom, anxiety)

155 Social factors increasing consumption (e.g. friendship group)
161 Social factors decreasing consumption, (e.g. comment from others)
157 Contextual/ environmental factors increasing consumption (e.g. alcohol offers, free entry to events, other people buying drinks)
160 Obstacles to positive drinking behaviour, context (club)
162 External factors impacting on drinking behaviour (money)
163 Expectation / routine when excessive drinking occurs (e.g. specific nights out, the weekend)
167 Contrast in drinking between summer and term time.
169 Drinking at home, difficult to keep track of quantities.
170 Quantities difficult to keep track of when mixed.
31 Some drinks are worse than others.

171 Usual drinking behaviour stated
172 Unusual drinking behaviour, reason provided
174 Recent change in consumption, increase
176 Positive drinking behaviour, externally driven (e.g. others cooked for them, hangover)

181 Concern from others (close) others.
183 Concern from others (close), disregarded
184 Acknowledging that others may hold a different view
185 Awareness of disapproval from others
188 Active re evaluation of concern from others

Comment on Unitcheck

189 Comment on Unitcheck, presentation (including: format, layout, ease of use)
190 Comment on Unitcheck, evaluation (including: engaging, useful, useful for others, not useful, thought provoking, good feedback, helpful)
195 Comment on Unitcheck, impact of summary
197 Comment on Unitcheck, content (including: length, inclusion of supporting info)
201 Task integrity (engaged, thorough, self correction, active recall)
205 Difficulty estimating other student drinking.
206 Comment on Unitcheck, credible source.
209 Main message, cut down and be aware of negative consequences (behaviour)

<u>Suggestions</u>
70 Comment on Unitcheck, suggested presentation of normative data
71 Suggested alternative comparison groups
211 Acknowledging practical limitations e.g. site functionality, underlying normative data
212 Unitcheck feedback calculation error, interviewee feedback not matching

213 Anticipating a challenge, not specified
214 Anticipating a challenge, -ve impact on health.
215 Anticipating something but incomplete

Knowledge

216 Knowledge, categorisation of spirits, assumption of equivalency

217 Knowldege, uncertainty re. size of measures.
218 Uncertainty re. categorising different types of alcohol.
219 (Incorrect) Knowldege, categorisation of mixers as non alcoholic drinks.
220 (Incorrect) Knowledge, eating after drinking is as good as eating before drinking.
221 Knowledge, interpretation of harm to physical health.
222 Knowledge, impact on sleep
223 Knowledge, confirmation
224 Knowledge, correcting existing knowledge
225 Knowledge, accessible from another source
226 Knowledge, interested in unit information
227 Knowledge, reported use of positive drinking strategy.
228 Knowledge, misunderstanding of guidance.

Change

229 Wants to change, but doesn't feel that she/he will
230 Should change (from self)
243 Acknowledging need to change
233 Change considered
231 Negative self evaluation, predicted failure to change
232 Change unlikely
234 Rating/acknowledging personal drinking as extreme
235 Currently trying to cut down.
237 Change not possible currently
175 No plan to change, not a concern.
238 Obstacles to change, current family stress, not listening to others
239 Circumstances supporting change, academic
240 Circumstances supporting change, occurrence of negative consequences
244 Possible change, future
246 Drinking is an active choice
248 Consequences are manageable therefore no need to change.
255 Reflection on change of perspective

Participant reflection

250 Active re evaluation of concern from partner
251 Negative evaluation of drinking behaviour, new perspective
252 Comment on personal drinking style
253 Relationship with alcohol, "need"
256 Questioning the normative data is a strategy to avoid negative self evaluation

Other
257 Problem drinking others
258 Story anecdote, incomplete
260 External factors impacting on emotional well being

Appendix 12: Coding framework

Themes	Categories	Description
Misc	1) Reading from Unitcheck 2) Registration and demographics 3) Participant query 4) Comment on the think-aloud method 5) Irrelevant statement 6) Response to the interviewer	
Ratings	1) Believability 2) Personal relevance (general) 3) Personal relevance (normative comparison group) 4) Recall of normative comparison group 5) Feedback on Unitcheck	1) Rating of believability of feedback information out of 7 2) Rating of personal relevance of feedback information out of 7 3) Rating of personal relevance of normative feedback out of 7 4) Participant names, or fails to recall normative comparison group when prompted by the interviewer 5) Participant comments on the design, content and functionality of the Unitcheck program
Information/evaluation	1) Answering the question, neutral/ambiguous 2) Answering the question, negative self evaluation 3) Answering the question, positive self evaluation 4) Answering the question, indecision 5) Answering the question, difficult to	1) Answering the question in Unitcheck, no further elaboration. 2) Participant answers a question leading to negative self evaluation 3) Participant answers a question leading to positive self evaluation 4) Participant is uncertain how to interpret or answer

	remember	the question 5) Participant struggles to recall recent behaviour in order to answer the question
Context	1) Increase alcohol consumption 2) Decrease alcohol consumption 3) Not specified 4) Positives	1) Circumstances associated with increased alcohol consumption 2) Circumstances associated with decreased alcohol consumption 3) The impact of circumstances on alcohol consumption is not specified 4) Participant highlights positives of alcohol consumption
Engagement with the feedback	1) Response to feedback, neutral 2) Response to feedback, accepting 3) Response to feedback, questioning 4) Main message	1) Participant reads through feedback information 2) Participant indicates that they accept feedback information 3) Participant indicates they disagree or question the feedback information 4) The participants summary of the Unitcheck feedback.
Relation of self to guidelines	1) Neutral 2) Negative self evaluation 3) Positive self evaluation	1) Guidelines are repeated with no further comment 2) Negative self evaluation of drinking in relation to recommended drinking guidelines 3) Positive self evaluation of drinking in relation to recommended guidelines
Response to normative feedback	1) Does not believe normative feedback 2) Considering normative feedback 3) Accepts normative feedback 4) Emotion	1) Statement of disbelief, no further elaboration 2) Questions normative feedback, but does not entirely reject it. 3) Agrees with normative feedback, or indicates acceptance/belief 4) Emotional reaction to feedback information

Challenging data/evidence	1) Challenging the normative data (e.g. stats, agenda, composition of comparison group) 2) Challenge based on personal experience of self and friends 3) Challenging definitions 4) Incorrect input	1) Questioning the provenance, purpose, composition and accuracy of the normative data. 2) Drawing on personal observations of student drinking/culture to challenge the accuracy of the normative data 3) Challenges to the current recommended drinking guidelines and definitions of problem drinking. 4) Challenges the accuracy of the normative feedback due to perceived incorrect input of data.
Position in reference group (comparison)	1) Comparison of self in relation to reference group a) Drink more b) Drink less c) Drink same d) Not specified or unknown 2) Expectation of reference groups 3) Comment on comparison group	1) The participant makes an estimate of their own alcohol consumption in relation to that of their peers. 2) Comment on expected drinking within a particular group. 3) Participant comments on the normative comparison group or suggests an alternative
Personal code	1) Statement of standards 2) Neutralising/discounting negative consequences	1) Statement of standards regarding personally acceptable alcohol consumption 2) Participant discounts or undermines identified negative consequences of drinking in excess.
Evaluation of self as a drinker	1) Neutral/ ambiguous 2) Negative 3) Positive	1) The participant comments on their drinking style or behaviour 2) Participant negatively evaluates their drinking style or behaviour 3) Participant positively evaluates their drinking style or behaviour

Knowledge	1) Correct/confirmed knowledge 2) Incorrect knowledge 3) Uncertainty/unknown	1) The participant expresses correct knowledge regarding drinking (e.g. units, recommendations) or states that their prior knowledge has been confirmed in the feedback. 2) The participant expresses incorrect knowledge regarding drinking. 3) The participant identifies a gap in their drinking knowledge or their knowledge is ambiguous.
Change	1) Considering change 2) Not considering change 3) Catalyst for change	1) The participant indicates a change in their thinking or drinking behaviour 2) The participant does not anticipate a change in their thinking or drinking behaviour 3) The participant identifies circumstances that they feel are likely to prompt change in their thinking or drinking behaviour.