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Alcohol Marketing and Young People's Drinking:
The Role of Perceived Social Norms

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Submitted for fulfilment of the Degree of Doctor of Philosophy

March 2014

This thesis is dedicated to the memory of Tom O'Gorman.

May 1974 – January 2014.

Ar dheis Dé go raibh a anam uasal.

Abstract

There has been substantial scientific debate about the impact of alcohol marketing on consumption. Relying mainly on econometric studies, the alcohol industry has traditionally maintained that alcohol marketing does not influence consumption, but is merely limited to brand level effects. Public health advocates, on the other hand, point to consumer-level research that shows a relationship between exposure to marketing and alcohol consumption, especially amongst the young. Recent longitudinal research has firmly established a causal relationship between alcohol marketing and alcohol consumption, giving the upper hand to the public health critics of alcohol marketing.

The new consensus forged by these recent cohort studies has led to two separate, but related, debates. In the first instance, having answered the question of *whether* marketing influences drinking behaviour, there is a need to establish *how* and *when* such effects occur. Secondly, in the face of the mounting longitudinal evidence on the effects of marketing, representatives of the alcohol industry have sought to move the debate away from marketing by explicitly highlighting peer influence as a more significant causal factor in problematic youth alcohol consumption.

This thesis tackles both of these new questions simultaneously by harnessing insights developed from social norms theory.

An online survey (N = 1,071) was administered to undergraduates of the Dublin Institute of Technology in Ireland, and mediation relationships were tested with logistic and

multiple linear regression methods as appropriate.

Amongst other findings, the main contributions of this thesis are: (1) that marketing may play a key role in establishing perceived social norms around alcohol consumption, and that these perceived norms may act as an indirect pathway for the influence of marketing on behaviour and (2) that the association between alcohol marketing and consumption may increase as levels of engagement with marketing increase; this engagement appears to be at its most potent when marketing facilitates simultaneous interaction between the consumer, the brand and the consumer's peers in an online social media environment.

This thesis helps to move the field of alcohol marketing scholarship beyond questions of *whether* marketing influences alcohol consumption to *how* and *when* that influence occurs. By showing how peers may act as *perpetuators* and *magnifiers* of marketing influence it also undermines the argument that peers matter more than marketing, and suggests that peer norms can act as a powerful marketing tool.

Acknowledgements

I owe so much to the many different people who have assisted me in various ways throughout the course of this research, and I can only feel a sense of deep gratitude for the help I have received from many quarters.

In the first instance, many thanks to my supervisor Professor Gerard Hastings. His advice, patience, encouragement and excitement at every stage of the process have been invaluable. I have been singularly fortunate in having him as my supervisor. Many thanks also to Anne Marie MacKintosh for her superb advice, help and patient assistance, especially in terms of questionnaire design and statistical analysis.

Thanks are due to the more than 1,000 Dublin Institute of Technology students who took the time to complete my questionnaire, and in particular to the 5 students who took part in lengthy cognitive interviews at the questionnaire development stage.

Many thanks to Dr Vicki Livingstone for her patient advice on statistical analysis and for preparing a number of the statistical tables.

I appreciate the assistance of many colleagues in the DIT who have assisted me with the travails of part-time PhD research – I have benefitted enormously from their experience, collegiality and flexibility. Thanks also to the DIT's College of Business (Director and Dean Paul O'Sullivan) and the School of Marketing (Head of School Kate Uí Ghallachóir) for financial, moral and practical support throughout this process.

I am very grateful to my many friends for their companionship and support. One hesitates to mention specific individuals. However, special thanks are due to my friend of over 20 years, Tom O'Gorman, to whom this thesis is dedicated. Tom was the one friend with whom I discussed my progress on the thesis most. I'm not exactly sure why that was! After a day of writing in the library I would text him a record of the word count produced that day, and he always had some words of encouragement or congratulations, depending on that day's report. Tom died on the night of 11 January 2014. He is sadly missed and fondly remembered.

Finally, many sincere thanks to my family – my mother Eileen, my late father John and my brother David for their support across many years. Special love and thanks to all my girls: Marian, Lucia and Gemma for all their hugs and constant sense of fun and laughter, and to my wife Rachel for her love.

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Chapter 1: Introduction

1.1   Introduction

Alcohol is no ordinary commodity (Babor et al., 2010). While it is a regular part of a balanced social life for many people, for others alcohol can lead to a myriad of serious side effects and social problems, including addiction, illness and death. The issues surrounding alcohol marketing, and its regulation, are deeply controversial. The alcohol industry maintains that its extensive advertising and marketing campaigns operate only at the level of brand preferences, while critics in the public health community argue that alcohol marketing contributes to higher overall levels of alcohol consumption.

This introductory chapter sets the scene for the rest of this thesis. It examines the *context* of alcohol consumption in Ireland; the *problem* of alcohol-related harm; the *debate* about the relationship between alcohol marketing and consumption; the *politics* of alcohol marketing regulation and concludes with an *agenda* which provides an overview of the structure of the rest of this thesis.

1.2 The context: alcohol consumption in Ireland

Alcohol consumption has long played a central role in Irish culture. Historical accounts reveal that drunkenness and its attendant social problems were commonplace in Ireland as early as the fifteenth century (MacManus, 1939; Plunkett, 1904), while the stereotypical image of the brawling, drunken Irishman was prevalent in the emigrant Irish communities of the nineteenth and twentieth centuries (Stivers, 1976). The acute poverty of many inhabitants of Dublin and other cities was exacerbated by widespread drunkenness and lead to the formation of several temperance and abstinence movements aimed at curbing the negative influence of drunkenness in Irish life. The most famous of these - the Pioneer Total Abstinence Association - founded in Dublin by a Catholic priest and 4 local women in 1898, grew to 360,000 members within 50 years (Ferriter, 1999).

However, it was during the affluent decade of the so-called 'Celtic Tiger', starting in the mid-1990s, that Irish alcohol consumption grew fastest, with per capita consumption increasing by 46% between 1987 and 2001, coinciding with an era of rapid economic growth (Strategic Task Force on Alcohol, 2002). Overall consumption then fell during an era of severe economic contraction between 2007 and 2009, but has remained relatively stable since then. The most recent reliable data from 2012 shows that the Irish are amongst the heaviest alcohol drinkers in the European Union, consuming 11.7 litres of pure alcohol per capita per annum compared with an EU average of 10.7 litres per capita (OECD, 2012).

However, in addition to having a very high level of alcohol consumption per capita, Ireland also has a disproportionately large number of people who never consume alcohol

– approximately 23% of Irish adults do not drink (Ramstedt and Hope, 2005), compared with an average across Europe of approximately 15% (Anderson and Baumberg, 2006). Thus, an even smaller pool of Irish people account for the nation's disproportionately heavy drinking levels. This implies that the average personal alcohol consumption of those in the drinking population stands at 14.6 litres per annum. This level of consumption is 58.6% higher than the recommended maximum low-risk weekly standard drink limit of 9.2 litres per capita.

The typical Irish drinking pattern may be as significant, from a public health perspective, as the quantities involved. While Ireland has one of the lowest levels of daily adult drinkers in Europe, it has one of the highest incidences of binge drinking (defined as five or more standard drinks per drinking occasion for men and four or more drinks for women (National Institute on Alcohol Abuse and Alcoholism, 2004)). The majority of Irish drinkers (56%) regularly drink alcohol in potentially harmful drinking ways (Morgan et al., 2008), with 48 per cent of men and 16 per cent of women reporting binge drinking at least once per week. Similarly, 34 per cent of Irish adults engage in binge drinking every time they consume alcohol, more than three times the average incidence across 29 other European countries and 17 times higher than Italy (TNS Opinion and Social, 2007). On all measures, and at each end of the spectrum, the Irish drinking pattern is more extreme than the moderate continental European approach.

1.3   The problem: alcohol-related harm

Total alcohol consumption levels, as well as the pattern of consumption, largely determine the impact of drinking on disease and mortality (World Health Organisation, 2011). A review of the personal and social consequences of heavy alcohol consumption in Ireland reveals the significance of the problems as well as the need for policies to address societal alcohol consumption levels.

The typical Irish pattern of heavy episodic drinking is far from risk free. According to the World Health Organisation, alcohol is the eighth leading cause of death in the world, and, after childhood malnourishment and sexual diseases, is the third leading cause of disease and disability globally. Approximately one in thirty of *all* deaths globally were due to alcohol in 2004; in Russia and surrounding countries, one on five of all deaths among men are attributable to alcohol (World Health Organization, 2011).

An analysis of alcohol-related deaths in Ireland between 2004 and 2008 makes for startling reading. In these five years, amongst those who were alcohol-dependent, 672 Irish people died from alcohol poisoning and 3,336 died from non-poisoning causes. Almost a quarter of those who died from non-poisoning causes died from alcoholic liver disease; amongst those who died in the 25-34 year age group this rises to 36.8%. Those who were younger were more likely to die as a result of trauma – the most common causes of traumatic death were falls (39.9%) and hanging (19.4%). 215 individuals who were not known to be dependent on alcohol died from alcohol related causes in this period, 66% of which were

due to accidents, the most common of which were drowning and choking (Lyons et al., 2011).

Furthermore, alcohol consumption accounts for 28 per cent of all attendances to the accident and emergency departments of acute Irish hospitals and alcohol related discharges were responsible for 874,395 bed days between 1995 and 2004 (Mongan et al., 2007). Alcohol consumption is causally related to cancers of the liver, head and neck, oesophagus, colon, rectum and the female breast (Baan et al., 2007). The rate of new alcohol related cancers in Ireland is estimated to double for women and to increase by 81 per cent for men up to 2020 (National Cancer Registry, 2006). In the four years between 2005 and 2008 inclusive, 4,129 Irish people under 30 were diagnosed with chronic diseases that are more typical of older people (Mongan, 2010). Between 1995 and 2009, the rate of alcoholic liver disease increased by 188%; the rate of increase was especially acute amongst the young - the increases in the 35-49 age group and the 15-34 age group were 227% and 275% respectively (Mongan et al., 2011). It is not a coincidence that the number of young people with alcoholic liver disease increased hand in hand with alcohol consumption rates. Sadly, alcoholic liver disease has few early symptoms and sufferers are often unaware of their problem until it is too late (Sheron, Olsen and Gilmore, 2008).

Children are not immune to the consequences of heavy drinking patterns. Alcohol consumption during adolescence can lead to structural and developmental changes in the brain (De Bellis et al., 2000; Spear, 2002). Despite widespread safer sex campaigns, rates of sexually transmitted infections have escalated by more than 200 per cent since the mid-1990s (Health Protection Surveillance Centre, 2006), perhaps a symptom of the

significantly higher rate of unintended sexual intercourse on the part of heavy drinkers (Hope, Dring and Dring, 2005).

Parental alcohol use is implicated in 50% of child protection cases in the UK (Prime Minister's Strategy Unit, 2004), and it is estimated that as many as 587,000 children in Ireland are living in families with some form of parental dangerous drinking (Hope, 2011). Heavier alcohol consumption has been associated with greater rates of family breakdown – one econometric analysis in the United States has estimated that a one litre increase in per capita consumption was associated with a 20% increase in divorce rates (Caces et al., 1999), and it is estimated that alcohol consumption is involved in more than one third of Irish domestic abuse cases (Watson and Parsons, 2005).

The British Crime Survey revealed that 45% of victims of crimes believed that the alleged criminals were under the influence of alcohol at the time of the crime (Kershaw et al., 2008). 21% of male college students and 10% of female college students reported getting into a fight in the previous 12 months due to their own personal alcohol use (Hope, Dring and Dring, 2005). As alcohol consumption expanded in Ireland between 1996 and 2003, the number of public order prosecutions trebled (O'Donnell, 2005), and it is estimated that alcohol consumption is involved in approximately half of the cases of sexual assault and abuse in adulthood in Ireland (Mongan, Hope and Nelson, 2009). Furthermore, despite a perceived shift in general social norms surrounding drink driving, alcohol plays a role in more than one third of all fatal road crashes (Bradford, O'Farrell and Howell, 2006).

The social, personal and emotional consequences of unhealthy patterns of alcohol consumption are much more profound than mere statistics can convey, and the impact of broken relationships and broken health on individuals cannot be adequately captured in economic terms. However, while the primary burdens of alcohol abuse are carried by individuals, society also bears a significant burden, and attempts have been made to estimate the economic consequences of alcohol abuse to the Irish taxpayer.

Based on an analysis of the data available from 2007, Byrne (2010) examined the estimated aggregate costs of alcohol consumption to the health care system arising from alcohol related illnesses and suicides, the costs of alcohol related crime and road accidents as well as the costs of reduced workplace productivity, along with increased absenteeism and rates of work related accidents. His analysis concluded that the total quantifiable economic costs to the Irish taxpayer were in the region of €3.72 billion for the year 2007. This equates to 1.3% of GDP and is approximately €3,318 per taxpayer.

Due to the level of alcohol consumption in Ireland, and the popularity of iconic Irish brands that are exported globally, it is natural to expect that the industry would make a large contribution to the Irish economy. Foley (2013) estimates that in 2012 the alcohol industry provided employment for 62,000 full or part time workers in Ireland and produced €1.1 billion in overseas exports as well as €2 billion in direct VAT and excise receipts to the Irish Exchequer. But it should be noted that, if there were significant shifts in consumer spending away from alcohol, the economic contribution of the alcohol industry to the Irish economy could be supplemented by growth in other consumer markets. However, the estimated economic costs of alcohol consumption would likely not

remain the same and would decline in line with reductions in per capita consumption levels.

These significant personal and social consequences of unhealthy drinking patterns have inevitably led to controversy about the root causes of alcohol consumption and about the best ways of addressing the problem. Public health advocates argue that the best way of addressing alcohol-related harm is to reduce per capita alcohol consumption (Nichols et al., 2012). Central to this debate is the influence of marketing on both total alcohol consumption levels and on the initiation of drinking amongst young people. A comprehensive ban on the promotion of alcohol has the potential to be a very cost-effective policy response to alcohol related harm (Anderson, Chisholm and Fuhr, 2009), but unsurprisingly, such restrictions are the subject of both intense debate and political resistance.

1.4   The debate: alcohol marketing and consumption

The relationship between alcohol marketing and drinking behaviour has been a matter of intense debate for some years. The drinks industry defends the legitimacy of its communications practices by arguing that the market for alcoholic beverages is a mature one and that the effect of advertising in mature markets is to encourage brand switching rather than changing overall consumption amounts (Ambler, 1996; Patten, 2007). On the other hand, public health critics argue that alcohol advertising glamourises drinking and fosters a cultur e supportive of excessive consumption (Dring and Hope, 2001).

There are two major approaches in the scientific literature. The first analyses actual market data using econometric techniques in order to examine the impact of alcohol marketing on aggregate consumption levels. Instead of using aggregate market data, the second approach focuses on consumers themselves, attempting to examine the impact of exposure to marketing on their attitudes and/or drinking behaviour.

1.4.1   Market level analysis: econometric studies

Econometric studies of advertising and consumption seek to model the relationship between total expenditure on advertising and total consumer spending on alcohol products and is predicated on the rationale that if advertising influences consumption, then variations in aggregate expenditure on advertising should result in corresponding variations in total consumption levels.

Econometric studies have been conducted in the United Kingdom (Dorsett and Dickerson, 2004; Duffy, 1982, 1983, 1990, 1991; Godfrey, 1988; Hagan and Waterson, 1983; McGuinness, 1980, 1983; Walsh, 1982), Europe (Calfee and Scheraga, 1994), the United States (Franke and Wilcox, 1987; Tegene, 1990) and Canada (Bourgeois and Barnes, 1979). The imposition or lifting of advertising bans theoretically presents an interesting quasi-experimental context in which a relationship between advertising and consumption can be modelled econometrically, and a number of such studies have also been conducted (Makowsky and Whitehead, 1991; Ogborne and Smart, 1980; Saffer, 1991, 2000; Smart and Cutler, 1976; Young, 1993).

With some exceptions (e.g., Saffer, 1991; 2000), econometric studies indicate that there is no, or at most a very minor, relationship between advertising and consumption. The alcohol industry has traditionally relied on this research in its defence of the legitimacy of its marketing activities. The industry is further supported in this stance by the evidence from fast moving consumer goods markets, where advertising in mature industries generally leads to brand switching rather than renewed market growth (Luik and Waterson, 1996; McDonald, 1992). Ambler (1996), defending the practices of the drinks industry, argues that advertisers are rarely concerned with overall category effects. Rather, it is the advertised brand itself, and its battle for market share, that is the focus of the brand manager's attention.

The reality, however, is not so simple. Econometric studies have numerous inherent weaknesses that significantly undermine their ability to accurately assess the marketing-consumption relationship. The econometric approach is, by its very nature, a rather blunt

tool that completely misses many fundamental elements of basic marketing theory and as such it is incapable of supporting the arguments proposed by the alcohol industry. There are at least a dozen different weaknesses that afflict the econometric evidence on the relationship between marketing and consumption.

Hastings et al. (2005) have outlined six fundamental weaknesses as follows:

1. Econometric studies often lack real data on alcohol marketing expenditure levels and generally have to rely on estimates of this expenditure.

2. More fundamentally, estimates of marketing expenditure only account for media spend and ignore expenditure on marketing creativity. Clearly, a well conceived and executed marketing campaign based on sophisticated consumer research will have a greater influence than one produced in an amateur fashion. Econometric studies completely ignore this fundamental dimension of marketing and are methodologically incapable of catering for it.

3. In a similar vein, econometric analyses are incapable of controlling for media vehicle effects, and as such they cannot take account of different levels of appeal and credibility depending on the media source from which they emanate (Aaker and Myers, 1987).

4. Econometric studies also fail to take account of the level of engagement consumers have with marketing. As will be argued later in this thesis, consumer involvement renders marketing particularly potent, and failing to take account of this risks ignoring the powerful real world influence of marketing.

5. Practically all econometric studies focus only on advertising and ignore the wider marketing communications mix and the inherent integration and mutual

reinforcement of messages across different marketing platforms (Kliatchko, 2005). This is a significant weakness in the evidence base presented by econometric studies. Given the importance of integrated marketing communications, any analysis that examines only advertising and excludes other forms of marketing communications is inherently limited.

6. Aggregate econometric studies are also a blunt tool because they examine markets in their totality and fail to consider the role of market segmentation and any targeting (deliberate or otherwise) of young consumers by the alcohol industry. Because of their limited experience with alcohol and their ongoing cognitive development, it is these consumers who are most prone to the influence of advertising and more susceptible to dangerous levels of binge drinking (Collins et al., 2007). It is possible that the weak population level impact of advertising evidenced in econometric studies simply reflects the averaging of a very small impact on older, more established drinkers and a more significant impact on younger, less experienced drinkers (Aitken and Hastings, 1992).

Four additional criticisms have been levelled against econometric studies by Kenny and Hastings (2010):

7. Econometric studies fail to control for the influence of advertising spill over from other jurisdictions or media markets, a phenomenon that continues to assume increasing importance due to the global reach of marketing communications.

8. With some rare exceptions (for instance, Hagan and Waterson, 1983), econometric studies do not control for the lagged effects of advertising across time. They rather naïvely seem to assume a 1:1 temporary relationship between advertising exposure

and consumer reaction, and ignore any residual influence from years of exposure and conditioning.

9. Similarly, they do not account for the likelihood that, in the context of the likely thousands of alcohol ads that consumers have been exposed to over many years, the marginal effects of a few euro of extra advertising are likely to be very small.

10. By definition, econometric studies also fail to capture many of the newest and most innovative marketing approaches that are specifically targeted at younger drinkers, particularly in online environments. Indeed, as traditional advertising comes under increased scrutiny and restriction, the less regulated areas of ambient and online marketing have attracted enhanced budgets and have assumed ever greater importance in commercial practice. For instance, in 2010, Diageo announced that 21% of its marketing spend was being diverted into digital channels (Mosher, 2012).

Several other criticisms come readily to mind, including the following:

11. Econometric studies are opportunity-based measures of a very blunt sort – they fail to measure actual exposure to marketing and cannot make fine-grained distinctions between heavy and light consumers of alcohol marketing messages.

12. The alcohol industry's reliance on econometric studies to support their position is somewhat ironic given that businesses do not determine the effectiveness of their own advertising campaigns by using such a blunt aggregate approach. Instead, marketing effectiveness is normally assessed at the level of individual consumers and their engagement with the brand in question (Hall, 2002; Hansen, 1995).

With such a variety of fundamental limitations, econometric studies can only provide a very anaemic insight into advertising's real world impact.

1.4.2 Individual level analysis: consumer based studies

An alternative to the use of aggregate market data in econometric studies is the use of consumer level data. There are three broad categories of consumer studies of relevance to the marketing-consumption relationship: cross sectional surveys, experiments and longitudinal studies. Taken as a whole, such consumer-based studies paint a very different picture of marketing's impact on behaviour.

Cross sectional studies

Cross sectional studies examine the relationship between marketing communications and subsequent attitudes and behaviour, often controlling for other likely confounding factors. By and large, these studies indicate that greater awareness of, and exposure to, alcohol advertising tends to be associated with more favourable attitudes towards alcohol and a greater propensity to drink in the future (Adlaf and Kohn, 1989; Aitken, 1989; Aitken, Leathar and Scott, 1988; Atkin, Hocking and Block, 1984; Austin and Knaus, 2000; Grube and Wallack, 1994; Strickland, 1984; Wyllie, Zhang and Casswell, 1998a,b). Cross-sectional studies are, strictly speaking, incapable of determining causal relationships, though a large number of cross sectional studies find very similar relationships between marketing and alcohol consumption, and their findings have been confirmed by longitudinal studies which are able to support more robust causal conclusions.

<u>Experimental studies</u>

In theory, experiments should overcome some of the limitations of cross sectional surveys, as they allow for the manipulation of both control and experimental groups, thus permitting researchers to draw firmer conclusions about cause and effect relationships (Patzer, 1996). A number of experiments have either been inconclusive or have shown no discernible effect of advertising on consumption (Kohn and Smart, 1984, 1987; Kohn, Smart and Ogborne, 1984; Lipsitz et al., 1993), although, more recently, one experimental study has indicated a significant effect of alcohol portrayals in movies and advertisements on consumption by young males (Engels et al., 2009). These mixed findings are likely a result of the inherent difficulty of capturing the complexity of the real life media consumption experience in an experimental setting (Smith and Foxcroft, 2009). Indeed, experiments by their nature seek to assess the marginal impact of one or two extra advertisements without controlling for prior exposure to advertising, the wider marketing communications mix or previous experience with alcohol. Further, as Anderson et al. (2009) emphasise, there are ethical issues surrounding the use of experiments in this field which make them unsuitable for use with young people.

<u>Longitudinal studies</u>

Longitudinal research, on the other hand, avoids the limitations of both experimental and cross sectional studies. When confounding factors are properly controlled for, longitudinal studies are capable of indicating a causal relationship because they show the influence of changes in advertising exposure on behaviour over time (Anderson et al. 2009). This body of research strongly confirms the public health community's position that alcohol advertising contributes to higher levels of consumption (Casswell, Pledger and Pratap,

2002; Casswell and Zhang, 1998; Collins et al., 2007; Connolly et al., 1994; Ellickson et al., 2005; Fisher et al., 2007; Henriksen et al., 2008; Pasch, Komro and Perry, 2007; Snyder et al., 2006; Stacy et al., 2004). Longitudinal studies have also uncovered a significant relationship between media exposure in general - including TV viewing, video music watching and game playing - and subsequent alcohol consumption in a number of different countries and across several different age groups (Hanewinkel, Morgenstern and Tanski 2008; Robinson, Chen and Killen, 1998; Sargent et al., 2006; van den Bulck and Buellens, 2005).

More recently, there have been four major, systematic reviews of longitudinal studies published in the area of marketing and alcohol consumption (Anderson et al., 2009; Meier, 2008; Science Group of the European Alcohol and Health Forum, 2009; Smith and Foxcroft, 2009). These systematic reviews are of one voice in their conclusions on the evidence about the marketing-consumption relationship. As Anderson et al. (2009: 229) express it:

Longitudinal studies consistently suggest that exposure to media and commercial communications on alcohol is associated with the likelihood that adolescents will start to drink alcohol, and with increased drinking amongst baseline drinkers. Based on the strength of this association … we conclude that alcohol advertising and promotion increases the likelihood that adolescents will start to use alcohol, and to drink more if they are already using alcohol.

The wider marketing mix

While most prior research has focused on traditional advertising, other researchers have found associations between alcohol consumption and ownership of alcohol branded

clothing and promotional items (Fisher et al., 2007; McClure et al., 2006), sponsorship (Davies, 2009; Jones, Phillipson and Barrie, 2009; O'Brien and Kypri, 2008; O'Brien et al., 2011; Wyllie, Casswell and Stewart, 1989), pricing (Coate and Grossman, 1988), new product development (Goldberg, Gorn and Lavack, 1994; Jackson et al., 2000) and online marketing (Casswell, 2004; De Bruijn, 2012; Epstein, 2011; Hartigan and Coe, 2012; National Center on Addiction and Substance Abuse, 2011). Recent research has also suggested that glassware used in on-licence premises is designed to influence consumer choice and should also be considered part of the wider marketing mix for alcohol products (Stead et al., 2014).

The latest trend has been towards recognising the integrated nature of marketing communications across multiple marketing channels, and more recent research has illustrated a link between marketing communications and alcohol consumption by utilising *cumulative measures* of exposure to marketing across multiple marketing channels, providing in the process a more realistic overview of the real world influence of marketing (Gordon et al., 2011; Jones and Magee, 2011; Lin et al., 2012; Pinsky et al., 2010; Tucker, Miles and D'Amico, 2013).

1.4.3   The debate: conclusion

In summary then, the alcohol industry has traditionally argued that alcohol advertising does not influence individual or aggregate consumption levels. It bases its position on a variety of econometric studies that assess the relationship between overall advertising expenditure and aggregate alcohol consumption. However, when it comes to determining

the influence of alcohol marketing on consumers, this research is flawed for at least a dozen different reasons.

The alternative approach, which uses consumer-based studies, has consistently uncovered a link between marketing and alcohol consumption. In recent years, more than a dozen different longitudinal studies, some using more realistic cumulative measures of exposure to marketing across multiple communications channels, have put the question beyond reasonable dispute: alcohol marketing is causally associated with alcohol consumption, and in particular with drinking initiation amongst the young who are most susceptible to the influence of alcohol marketing (Casswell, Pledger and Pratap, 2002; Collins et al., 2007; Ellickson et al., 2005) and who are also highly vulnerable to some of the negative consequences of alcohol consumption.

This maturation of the academic evidence has generated two new debates, one of which is academic in nature, the second of which is political.

Having affirmatively answered the question of *whether* alcohol marketing influences consumption, there is now a need to understand *how* and *when* such influences occur (Dobson, 2012). Thus, the latest research agenda for scholars of alcohol marketing is to consider the mechanisms by which alcohol marketing influences consumption patterns, and to investigate whether there are special circumstances, either occurring naturally or contrived by marketers, that make alcohol marketing communications more powerful. It is this question of *how* and *when* alcohol marketing influences consumption with which the rest of this thesis is fundamentally concerned.

But it is first necessary to briefly consider the second debate that has been generated by the solidifying evidence base on alcohol marketing. That second debate is inherently political in nature, and it concerns the efforts by Governments and other regulatory authorities to restrict and/or regulate alcohol marketing, and the corresponding attempts by the alcohol industry to resist such restrictions in favour of self-regulatory systems and to simultaneously deflect attention away from marketing by highlighting the importance of peer influences. It is to this political debate that we now briefly turn.

1.5   The politics: alcohol marketing regulation

The political debate surrounding the regulation of alcohol marketing is not without precedent, and the alcohol industry seems to have learned very valuable lessons from the experience of the global tobacco industry. The political aspects of the alcohol marketing debate will be discussed in the Irish context. However, the broad contours of this debate are similar in many other jurisdictions, including the United Kingdom.

1.5.1   Learning from Big Tobacco

Despite the glamour of cigarette smoking in the early 20th century, itself largely fostered by the growing popularity of Hollywood movies and increasingly sophisticated marketing, concerns started to emerge in the 1950s about the addictive nature of nicotine and its impact on health, as well as the role of advertising in glamourising smoking and attracting young smokers (Brandt, 2007). The major tobacco companies rejected these concerns in the face of growing counter-evidence and adopted a defensive posture by denying the health consequences of smoking and by resisting marketing regulations through reliance on econometric studies, much like the alcohol industry today.

The chief executives of the major tobacco companies ultimately lost political credibility when they each swore before a United States congressional committee in 1994 that they did not believe that nicotine was addictive. Unable to withstand the mounting scientific evidence marshalled against them, in 1998, the major US cigarette manufacturers were

forced to pay almost $250 billion to compensate the individual states for the costs they incurred in tobacco-related health expenses (Brandt, 2007).

Given the sheer weight of scientific evidence amassed against them, and their consequent loss of political credibility, cigarette manufacturers were unable to prevent major restrictions on tobacco marketing in countries across the developed world. To be sure, tobacco marketers have remained active, doubling their promotional spend in the US within a few years of the 1998 Master Settlement (Federal Trade Commission, 2009). But the experience of the tobacco companies in the policy and regulatory debates in the developed West presented some instructive lessons for any industry facing increased public scrutiny, the most significant of which was the need to be seen to engage proactively with the process of self-regulation as a strategy to forestall tighter legislative restrictions. It would appear that the alcohol industry in Ireland has taken this lesson to heart.

1.5.2   Industry funded social aspect organisations

Instead of passively waiting for the introduction of legislation to restrict alcohol marketing, the alcohol industry has established and funded a number of companies to further the cause of self-regulation in an effort to proactively project an image of responsible social engagement. Whether such initiatives are genuinely motivated by social concern or merely to forestall more stringent measures is a matter of conjecture; what is clear is that the proactive approach adopted by the alcohol industry in Ireland has helped

to shape an image of social responsibility with policy makers and that for almost a decade it has served to postpone planned legislation that would restrict alcohol marketing.

Central Copy Clearance Ireland

Advertising in Ireland is regulated by the Code of Standards for Advertising, Promotional and Direct Marketing in Ireland, which is published by the Advertising Standards Authority for Ireland (ASAI). Referring to the promotion of alcohol, the code specifies that advertising should not promote alcohol as a way of improving physical performance or personal qualities, or imply that alcohol will lead to greater personal, business or social success nor make the drinker more attractive to the opposite sex (Advertising Standards Authority for Ireland, 2007).

Prior to 2003, the ASAI code only operated retrospectively, and the onus was on the public to make a formal complaint if they felt a breach of the code had occurred. As a response to complaints about frequent breaches of the code, and heightened public scrutiny of alcohol marketing due to increasing rates of binge drinking at that time, the drinks and advertising industries collaborated in the establishment of Central Copy Clearance Ireland, the aim of which is to pre-vet all alcohol advertisements to ensure compliance with the ASAI Code. Board members are appointed by advertising trade associations and the work is funded by the alcohol industry.

This strategy appears to have been a successful one for alcohol companies. Following the establishment of Central Copy Clearance, the number of complaints against alcohol advertisements reduced significantly, allowing the industry to boast about the

effectiveness of industry self-regulation. By eliminating some of the more flagrant breaches of the advertising code, a powerful rhetorical weapon was removed from the hands of critics of the industry.

But the pre-vetting system remains problematic. The fact that a committee appointed by the advertising industry approves of an advertisement does not *de facto* mean that the advertisement actually does comply with the code in practice. Nor does it mean that consumers themselves, especially the young, don't perceive such pre-approved advertisements as containing sexual or social or other appeals that are prohibited by the code. Content restrictions have a very wide latitude of interpretation (University of Stirling, 2013) and it is ultimately the perception of consumers themselves that matters, not that of the advertising industry. Further, the decline in the number of complaints about alcohol advertising may not in fact be a result of advertisements adhering more strictly to the codes, but, instead, may simply reflect a lack of motivation to complain on the part of the public. Finally, mere compliance with the terms of the ASAI Code does not guarantee that advertising will not influence consumption, especially for those younger consumers who are most vulnerable. Indeed, studies showing a link between advertising and consumption do so on the basis of advertising exposure - the influence of alcohol marketing is not predicated upon it breaching self-regulatory codes. Furthermore, as this thesis will argue in later chapters, being exposed to, or engaged with, alcohol marketing helps to shape social norms around drinking seemingly *irrespective of the content* of those marketing messages.

While adherence to advertising codes that seek to foster a basic level of content responsibility is in itself a good thing, in practice it may not make much difference in terms of consumer protection. However, in terms of the alcohol industry it has made a significant difference by providing the opportunity to create a perception of pro-active social responsibility.

Mature Enjoyment of Alcohol in Society

The launch of Mature Enjoyment of Alcohol in Society (MEAS – the Irish word for "respect") in 2003, around the same time as the launch of Central Copy Clearance Ireland, further bolstered the image of the industry as a responsible stakeholder. Funded by the alcohol industry, MEAS promotes a "responsible drinking" message through seminars and conferences, the website www.drinkaware.ie and through a variety of responsible drinking advertisements. For a number of years MEAS also published its own code of practice on alcohol promotions, although this has now been suspended.

Responsible Retailing of Alcohol in Ireland

The Intoxicating Liquor Act (2008) gave the Minister for Justice the power to introduce regulations to limit the sale of alcohol in supermarkets to an area that is separated from the rest of the store by a wall or a gate and also empowers the Minister to prevent alcohol from being sold below cost. However, the Irish Government declined to enact the provisions restricting below cost selling. It also decided not to introduce regulations to control the placing of alcohol in supermarkets, opting instead to enter into another voluntary agreement with another newly formed industry organisation called Responsible Retailing of Alcohol in Ireland. Instead of placing alcoholic beverages behind a wall or

gate as outlined in the legislation, the agreement simply ensured that, as far as possible, customers did not have to pass through an area selling alcoholic beverages in order to reach other products in the supermarket.

1.5.3   Government initiatives

The ability to position itself as a responsible stakeholder seems to have served the alcohol industry well. In early 2005, the government indicated that a Bill was being prepared to place substantial legal restrictions on alcohol marketing practices. But, in December of that year, the Department of Health and Children announced that, rather than introduce legislation, it had instead entered into a co-regulatory agreement with the drinks industry. This switch from a legislative to a voluntary solution would seem to be the result of very effective lobbying on the part of the industry. Parts of the text of the voluntary code were cut and pasted directly from lobbying letters written to the Minister for Health, complete with serious grammatical errors contained in the original letter (O'Toole, 2005).

At the time of writing, a Public Health (Alcohol) Bill is in preparation, based in part on the proposals of an expert steering group established to recommend measures to reduce alcohol-related harm in Ireland (Department of Health and Children, 2012). One of the recommendations of this group was the prohibition of sports sponsorship by alcohol brands. As matters currently stand, this proposal has not been included in the legislation and has been deflected to a working group that was established to discuss the matter. One of the central arguments produced to effectuate this postponement was that it is important for the Government to work with all stakeholders, including the alcohol industry, to find

common solutions to the problem of alcohol misuse. Such an argument would not have been tenable without some evidence of pro-active social engagement on the part of the alcohol industry.

1.5.4   Industry response to growing scientific consensus

As scientific consensus has solidified around the importance of marketing in influencing consumption, especially amongst the young, the alcohol industry has attempted to deflect the debate by arguing that, while there may be some evidence that marketing influences consumption, it is really peers that matter most, and, compared to the social influence of peers, that marketing is of much lesser significance. This argument has been employed in Ireland (Alcohol Beverage Federation of Ireland, 2011; Laure, 2013); the United Kingdom (The Portman Group, 2012); the United States (Distilled Spirits Council of the United States, 2002) and Australia (Distilled Industry Spirits Council of Australia, 2012). At the European level, the argument has been stated very succinctly by the spiritsEurope industry lobby group: *"There is very little scientific evidence that advertising influences young people – parental and peer approval are actually much more influential"* (spiritsEurope, 2012).

The remainder of this thesis is dedicated to examining this argument in the context of examining *how* and *when* marketing influences alcohol consumption. Peers do not live in a cultural or media vacuum: they too are influenced by marketing. This thesis argues that perceived peer norms may be in part created by marketing and that they may act as an indirect pathway for the influence of marketing on young people. While peer behaviour is indeed a potent influence on alcohol consumption, perceptions (and indeed,

misperceptions) of this behaviour are generated through exposure to, and engagement with, alcohol marketing communications. Furthermore, the industry actively recruits individuals to inadvertently market their products to their peer networks in online social media. Far from being an entirely separate source of influence, peers have become perpetuators and magnifiers of marketing.

1.6   The agenda: The structure of this thesis

The alcohol industry is correct: peers matter, and perceptions about peers matter even more. Chapter 2 presents a comprehensive overview of the literature on perceived social norms. This literature originates in different theoretical domains, including the work of social norms marketers who try to change behaviour through manipulating social norm perceptions and also that of communication theorists and sociologists who examine the influence of perceived norms on behaviour. Often these two related networks of scholars seem not to interact as coherently as one might expect, leading to confusing and sometimes inconsistent use of terminology. Chapter 2 attempts to integrate the growing field of social norms research, and concludes with an examination of one of the gaps in this research, namely the antecedents of social norm (mis)perceptions.

Chapter 3 develops a number of Research Propositions and supporting hypotheses around alcohol marketing and perceived social norms, and outlines in detail the data collection methods employed in this research and the rationale for each methodological choice that was made. There are 8 Research Propositions in total. 3 of these form the core foundation of this thesis and are the focus of the main body of the text. The remaining 5 Research Propositions and supporting hypotheses are what might be described as *secondary* in nature. Each of these 5 secondary Research Propositions makes a unique contribution to the theory and they also have significant practical implications in their own right. However, they are secondary in the sense that they serve to extend and deepen the discussion around the core question of the role of social norms as an indirect pathway for the influence of marketing on consumption. In order to allow the reader to focus on the

central question, and to allow for a smoother narrative flow through the text, the discussion of these 5 Research Propositions, along with the related statistical analysis and discussion of results, can be found in Appendix II, III and IV respectively.

Data analysis is discussed in two separate chapters. In Chapter 4, strategic choices that were faced in analysing the data are outlined in detail, including data manipulation and screening as well as the rationale for utilising logistic regression analysis and the specific challenges in conducting mediation analysis with data of this nature. Chapter 5 then presents the analysis of the 3 core Research Propositions along with some preliminary discussion of the findings.

In Chapter 6, the main conclusions of the research are presented, along with their contribution to theory and their policy implications, as well as a discussion of the limitations of the research and suggestions for future research agendas. In brief, the core conclusion of this thesis is that alcohol marketing seems to play a key role in establishing perceived social norms around alcohol consumption, and that marketing seems to be more powerful when it facilitates simultaneous interaction between the consumer, the brand and the consumer's peers. Such circumstances are to be found in the newest forms of online alcohol marketing, especially in a social media environment. In essence, far from perceived peer behaviour being an *alternative* source of influence, in some circumstances they act as *perpetuators* and *magnifiers* of marketing, and are in fact actively recruited as such by alcohol marketers.

Chapter 2: Overview of social norms theory

2.1   Introduction

A solid appreciation of social norm perceptions − and specifically their formation, their influence on behaviour and the effects of manipulating them through marketing campaigns − is important for social marketers. Curiously, however, social norms have received relatively little attention in the marketing literature (Burchell, Rettie and Patel, 2013). Social norms are of equal importance for social marketers engaged in both 'upstream' and 'downstream' (Goldberg, 1995) efforts to bring about behaviour change. Social marketers engaged in traditional 'downstream' initiatives aimed at encouraging change on the part of those who have already developed unhealthy behavioural habits (rescuing those who have already fallen into the river in Goldberg's analogy) can benefit from understanding how the manipulation of social norm perceptions can bring about positive change on the part of both individuals and groups. Most research in the field focuses on this task of changing the habits of those who are already engaged in harmful activity. However, those with an interest in 'upstream' social marketing, who want to prevent people developing unhealthy habits (or jumping into the river, as Goldberg would put it) in the first place, may also find the insights garnered from the social norms literature to be beneficial for their work.

This chapter reviews the diverse literature on social norms, arguing that norms are a powerful influence on human behaviour, especially amongst the young and vulnerable. In particular, the chapter examines the somewhat controversial 'downstream' applications of normative influence in the so-called social norms approach, critically examining some of the weaknesses of this work. It then examines the comparatively less researched, but

significant, upstream applications of social norms by examining sources of normative influence, and suggests that marketing may be an antecedent of norm formation and that norms may be an indirect path through which marketing influences behaviour.

2.2   The nature of social norms

Social norm influences are situated within the wider field of peer influence, a topic on which there is a broad consensus in the empirical literature. Peers are generally acknowledged as one of the most significant influences on a variety of behaviours throughout adolescence (Borsari and Carey, 2001), and often overtake parents in importance as sources of influence as children progress through their teenage years (Csikszentmihalyi and Larson, 1984). Peers exert influence both directly and indirectly (Borsari and Carey, 2001). Direct peer influence has been subject to considerably less empirical investigation, but the evidence that exists indicates that direct offers to engage in, for example, drinking, smoking and sexual relations, exert a strong influence on behaviour (Klein, 1992; Rabow and Duncan-Schill, 1994; Shore et al., 1983; Wood et al., 2001), particularly in the case of those who are less socially established and personally mature.

Significantly more research has focused on indirect peer influences, of which there are two types: modelling and social norms. For methodological reasons, most modelling research has focused on drinking behaviour in quasi-experimental settings in which subjects are paired with confederates in a bar. This body of research shows that models influence concurrent, but not future drinking (Caudill and Kong, 2001; Caudill and Marlatt, 1975; Collins et al., 1985; Derrico and Garlington, 1977). Interest in the modelling explanation for peer influence has declined in recent years, in part because of the significant methodological challenges inherent in the experimental approach to modelling research (Borsari and Carey, 2001).

In contrast, social norms have consistently been seen as important drivers of human behaviour, with some of the earliest work on social norms being published in the early part of the last century. Sumner (1906) understood norms to be the customs adopted by a group in order to effectively meet their basic needs, while Sherif (1936) conducted some of the earliest experiments on norm formation and transmission.

Since these early works, norms, variously defined, have played an important role in a variety of sociological and communication theories which either use norms as explanatory variables or seek to determine their influence on behaviour. These theories include, amongst others, the theory of reasoned action (Fishbein and Ajzen, 1975); the theory of planned behaviour (Ajzen, 1991); attribution theory (Heider, 1958); social learning theory (Bandura, 1986); problem behaviour theory (Donovan et al., 1983); social comparison theory (Festinger, 1954); spiral of silence theory (Noelle-Neumann, 1973); peer cluster theory (Oetting and Beauvais, 1987); cultivation theory (Gerbner and Gross, 1976); the theory of presumed influence (Gunther and Storey, 2003); symbolic interactionism (Mead, 1934); differential association theory (Sutherland and Cressey, 1955); social identity theory (Turner, 1982); self-categorization theory (Turner et al., 1987); primary socialization theory (Oetting and Donnermeyer, 1998) and social network theory (Granovetter, 1973). The literature touching on norms is vast and complex, and this extensive range of norm-related theories and perspectives itself reflects both the importance and complexity of social norms.

More recently, there has been a significant expansion in the field of social norms studies, particularly as a result of the discovery that people tend to overestimate peer norms (Perkins and Berkowitz, 1986), that these overestimations influence behaviour (Cialdini et al., 2006), and that behaviours can be changed when these overestimations are corrected (Perkins et al., 2010). These recent developments have lead to the development of what could be termed the "social norms approach" as a distinct field of investigation (Perkins, 2003). While acknowledging the important contribution of each of the previously mentioned norm related theories, in order to allow for a more succinct focus and narrative structure, this chapter will primarily focus on the social norms approach, its critics and its implications.

2.2.1 Types and characteristics of social norms

Perhaps one of the greatest challenges hampering the development of social norms studies has been the inconsistent use of terminology, which is both a contributor to, and a symptom of, conceptual confusion in the field (Larimer et al., 2004; Rimal and Real, 2003). Researchers have examined the influence of social norms under such diverse terms as local and global norms (Miller and Prentice, 1994), proximal normative beliefs (Maddock and Glanz, 2005), normative beliefs and modelling (Oosteven et al., 1996), social modelling (Wood et al., 2001), peer norms and adult norms (Epstein et al., 1999) and perceived social influences (Dusenbury et al., 1994).

This general confusion has hampered the development of the field and frustrated attempts to coherently unpack the relative importance of normative social influences in different

behavioural contexts. However, it does seem that the persuasive conceptual and empirical work of Rimal and colleagues in developing the Theory of Normative Social Behaviour (Lapinski and Rimal, 2005; Rimal, 2008; Rimal and Real, 2003, 2005; Rimal et al., 2005), as well as the experimental work of Cialdini and colleagues in developing the Focus Theory of Normative Conduct (Cialdini, 2003; Cialdini et al., 1990, 2006; Kallgren et al., 2000; Reno et al., 1993) is beginning to bring greater consensus and coherence to the field.

Notwithstanding the development of this consensus, there remain significant conceptual and definitional challenges in the social norm literature. In order to utilize normative influences effectively, social marketers must be able to distinguish between the different types of norms, their underlying causes and their different impacts upon behaviour (Lee et al., 2007).

Perhaps the simplest way to classify the different types of norms is in two broad categories: namely descriptive and prescriptive norms. Prescriptive norms, in turn, can be categorized as being either injunctive norms or subjective norms. A third overall category – that of personal norms – is also of note. Although sometimes considered to be another type of social norm (Bobek et al., 2007), personal norms are technically not *social* in nature, although they are almost certainly influenced by, and moderate the influence of, the other types of norms.

Descriptive norms

Descriptive norms operate by way of example (Cialdini et al., 2006) and refer to perceptions of what others actually do in a given situation. They are a powerful influence

on behaviour, especially in novel or ambiguous contexts (Lapinski and Rimal, 2005) and amongst those who are susceptible to social anxiety (Neighbors et al., 2007a). Following the descriptive norms we observe in our surroundings requires little cognitive processing – even birds and fish and insects follow the descriptive norms of their peers (Cialdini, 2003). These norms broadly influence behaviour because individuals perceive that others, especially those who are similar, are effective guides to behaviour (Deutsch and Gerard, 1955; Fekadu and Kraft, 2002). Many of the 'social norms' interventions which have become popular in recent years are actually really only 'descriptive norms' interventions as they generally only focus on this source of influence (Rimal and Real, 2005).

Prescriptive norms

Prescriptive norms are based on opinions and values rather than on the behaviour of others, and refer to how individuals 'ought' to behave (Cialdini et al., 1990). The term is rarely used in the literature (see Yanovitzky et al., 2006 for an exception). Instead, prior research has used the terms *injunctive* and *subjective* norms, although these constructs could more usefully be seen as categories of prescriptive norms.

Subjective norms are an important component of the theory of reasoned action (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) and the theory of planned behaviour (Ajzen, 1991) and refer to perceptions of whether 'most people who are important to him think he should or should not perform the behaviour in question' (Fishbein and Ajzen, 1975: 302). Injunctive norms, on the other hand, refer to what is (dis)approved of by most people (Cialdini et al., 1991).

Many theorists view injunctive and subjective norms as analogous to each other (Neighbors et al., 2007b ; Rimal and Real, 2005), although it seems more appropriate to view them as distinct, although often related, sources of influence (Bobek et al., 2007; Cialdini and Trost, 1998; van den Putte et al., 2005). Depending on the circumstances, injunctive and subjective norms may be congruent with each other. For example, in most situations both the subjective norms of important others, and the injunctive norms of society at large, may be opposed to the use of extreme violence. But in other circumstances clear conflicts can arise. For example the important reference group of parents (subjective norm) might prefer adolescents to delay sexual initiation but the wider cultural values (injunctive norm) could encourage early sexualisation. Similarly, the close reference group of peers (subjective norm) may encourage illegal drug use, but society at large (injunctive norm) communicates disapproval of this behaviour through its laws. There may even be conflicting subjective and injunctive norms at work simultaneously, whereby parents and peers (both sources of subjective norms in this example) could differ with respect to their views on alcohol consumption, while society in general (injunctive norm) also communicates confused messages with respect to restrictions on underage consumption on the one hand and the simultaneous glamourisation of drinking communicated through pervasive marketing messages on the other. These simple hypothetical examples illustrate the importance of separating out injunctive and subjective norms and serve to highlight the theoretical complexity of normative influences which can sometimes be mutually reinforcing or contradictory in nature. The examples also raise important issues about the salience of the reference group (Berkowitz, 2005; Borsari and Carey, 2001; Linkenbach et al., 2003) which will be examined later in the chapter.

<u>Personal norms</u>

Personal norms, on the other hand, despite occasionally being labelled as social norms (Bobek et al., 2007; Reno et al., 1993), are not principally social in nature, and could more usefully be understood as self-based standards of behaviour that derive from deeply held personal or moral values (Schwartz, 1977; Schwartz and Howard, 1982). As suggested by research in the field of opinion formation and communication, such personal norms may be shaped by normative social influences (Neuwirth and Frederick, 2004; Newcombe, 1943; Noelle-Neumann, 1973). Perhaps one of the most important sources of personal norms is religious belief, but the extent to which such moral values are based on carefully thought-out principles − analogous to the intrinsic religiosity referred to by Galen and Rogers (2004) − or are simply a reflection of the prevailing norms of the salient religious reference group, and thus liable to change in different contexts, will vary with each individual case. Similarly, the relative influence of personal norms versus other types of norms will be situationally dependent (Kallgren et al., 2000).

The failure to comply with social norms generally involves some form of informal social sanction (Bendor and Swistak, 2001). The presence of such sanctions are somewhat inherent in the concept of prescriptive norms (Rimal and Real, 2005) and, despite Lapinski and Rimal's (2005) suggestion to the contrary, sanctions can also operate in the case of descriptive norms where failure to comply can lead to a potential loss of popularity or exclusion from the social network (Crandall, 1988; Schachter, 1951). Sanctions may also apply in the case of personal norms, manifesting themselves as a loss of self-esteem or self-approval (Schwartz, 1977), otherwise known as a guilty conscience.

2.3   Social norms influence behaviour

The substantial empirical literature of the past two decades provides significant evidence that normative perceptions, variously defined, influence many different types of human behaviour. By far the largest body of work has focused on the influence of normative perceptions on alcohol consumption, where social norms are generally held to be amongst the strongest influencers of drinking behaviour (Homish and Leonard, 2008; Lee et al., 2007; McAlaney and McMahon, 2007; Maddock and Glanz, 2005; Mallett et al., 2009; Mattern and Neighbors, 2004; Neighbors et al., 2007a, 2007b; Perkins et al., 2005; Read et al., 2005; Spijkerman et al., 2007; Yanovitzky et al., 2006). See also Borsari and Carey (2003) for a review of pre-2003 studies).

The evidence for normative influences on behaviour is not limited to drinking behaviour alone. Several studies have illustrated a relationship between social norms and smoking (Abroms et al., 2005; Andrews et al., 2008; Botvin et al., 1992; Chen et al., 2006; Gunther et al., 2006; Nichols et al; 2006; Slomkowski et al., 2005; van den Putte et al., 2004); littering and environmental protection (Cialdini, 2003; Cialdini et al., 1990; Kallgren et al., 2000; Reno et al., 1993; Schultz et al., 2007); sexual behaviour (Albarracin et al., 2004; Bearman and Brückner, 2001; Bersamin et al., 2005; Chia, 2006; Fekadu and Kraft, 2002; Flores et al., 2002); gambling (Larimer and Neighbors, 2003; Moore and Ohtsuka, 1999; Neighbors et al., 2007c; Sheeran and Orbell, 1999); tax compliance (Bobek et al., 2007; Webley et al., 2001; Wenzel, 2005); eating and dieting behaviours (Crandall, 1988; Eisenberg et al., 2005; Field et al., 1999, 2001; Huon et al., 2000; Paxton et al., 1999); video pirating (Wang, 2005); opinion formation in childhood (Rutland et al., 2005); pre-marital counselling (Sullivan et

al., 2004); voting intentions (Glynn et al., 2009); workplace health and safety (Linnan et al., 2005); the purchase of luxury products (Makgosa and Mohube, 2007); subject enrolment choices in schools (Dalgety and Coll, 2004); and approaches to parenting (Linkenbach et al., 2003).

It is worth noting that there is not complete consensus on the power of norms to influence behaviour. For instance, in a study of students at two different universities, Cameron and Campo (2006), contrary to much of the previous research, found that across a variety of different behaviours normative influences were not significant predictors of behaviour and that demographic factors, as well as actually liking the behaviour in question, was a more significant predictor than normative perceptions. However, this finding may be explained by the Theory of Normative Social Behaviour (Rimal and Real, 2005), which holds that positive behavioural expectancies are related to normative perceptions and mediate their influence on behaviour. Cameron and Campo's finding of a weak influence of norms on behaviour in a sample of 393 students in two universities also has to be set against Perkins et al.'s (2005) study of 76,145 students across 130 college campuses in which normative perceptions were a far more significant driver of drinking behaviour than any other personal or demographic factors.

It must be admitted that most of the previously mentioned work on norms and behaviour is cross-sectional in nature and provides indications of correlation rather than causation. However, the work Cialdini and colleagues in developing the Focus Theory of Normative Conduct (Cialdini, 2003; Cialdini et al., 1990, 2006; Kallgren et al., 2000; Reno et al., 1993), some of the work developing and testing the Theory of Normative Social Behaviour

(Rimal, 2008; Rimal et al., 2005), as well as the work by Glynn (2009) on voting behaviour and Wenzel (2005) on tax compliance, provide an experimental evidence base for the argument that norms influence behaviour. In addition to this, the quasi-experimental nature of the social norms marketing approach, which seeks to change behaviour by correcting normative misperceptions, provides some indirect experimental evidence that norms shape behaviour (Perkins et al., 2010; see Section 2.4). On the balance of evidence currently available − a large array of cross-sectional studies across a very wide spectrum of behavioural actions with diverse populations, supported by a smaller number of experimental studies – it seems safe to conclude that norms play a very significant role in driving human behaviour, especially in ambiguous situations typically experienced by the young (Moscovi, 1976) and amongst those who are generally susceptible to social influence (Park and Lessig, 1977).

2.3.1   Explanatory theories of normative influence

Of course, the mere fact that people behave, or believe, in a certain way does not mean that others blindly follow. If this were the case there would be no outstanding bravery or selflessness or politically unpopular opinions (Lapinski and Rimal, 2005). The influence of norms is considerably more complex than the mere copying of others.

A number of attempts have been made to develop an explanatory framework for the influence of social norms. Some of this work draws upon such previously mentioned sociological theories as social learning theory (Bandura, 1986), social identity theory

(Turner, 1982) and social network theory (Granovetter, 1973) and, as such, is largely beyond the scope of this chapter.

Pool and Schwegler (2007) proposed three different motivations for norm compliance. First, they argue that individuals comply with norms because they believe that the actions of others provide a clue to successful behaviour, especially in ambiguous situations. These are known as accuracy-related reasons for compliance. Self-related reasons for compliance include the positive social identity associated with following a particular norm, while other-related motives imply a concern for acceptance within a group and the desire to avoid being ostracized for non-compliance with the group norm. While it is likely that individuals will primarily conform to descriptive norms for accuracy-related motives, personal norms for self-related motives and prescriptive norms for other-related motives, numerous motives are likely to be at work simultaneously.

Two general theories of normative influence have been developed and tested with a view to explaining the behavioural influence of social norms.

Focus Theory of Normative Conduct

The Focus Theory of Normative Conduct was developed and tested across a variety of innovative littering experiments by Cialdini and colleagues (Cialdini, 2003; Cialdini et al 1990, 2006; Kallgren et al., 2000; Reno et al., 1993) in an attempt to delineate the respective influence of descriptive and injunctive norms and to better understand the potential for harnessing these norms in behaviour change campaigns.

The earliest experiments on the Focus Theory involved experimental manipulations to investigate the conditions that would increase the likelihood that visitors to a hospital would drop litter in the car park (Cialdini et al., 1990). In the first experiment, subjects exiting the elevator to return to their car encountered a confederate reading a handbill, who in half of the cases clearly dropped this handbill on the floor in view of the subject. In the remaining cases he walked past holding the leaflet. Most of the participants noticed this littering episode and momentarily deflected their attention to the garage floor; those who did not notice were excluded from the analysis. The purpose of the littering episode was to focus attention on the manipulated condition of the garage floor and to make this salient in the mind of the participants. The state of the floor indicated a pre-existing descriptive norm – in some cases the floor was significantly littered and in others it was clean, apart from the recently dropped handbill. When the participants returned to their cars they found an identical handbill to that which was littered by the confederate underneath their windscreen wipers. The leaflet contained a short, bland message about car safety and did not refer to littering. There were no bins in the vicinity and participants faced the choice of throwing the leaflet on the ground or taking it away with them. As hypothesized by the researchers, there was less littering in those circumstances in which participants saw the confederate drop litter in an already clean environment, although the difference was not significant. The researchers concluded that the effect of dropping litter onto a clean floor was to make the anti-littering descriptive norm salient, which in turn leads to less littering. The fact that participants did not automatically copy the behaviour of the littering confederate, but instead seemed to be influenced by the salient descriptive norm, indicates a normative, as opposed to a modelling, influence.

These findings were developed by the same researchers through two similar experimental manipulations (Cialdini et al., 1990). These subsequent experiments indicated that the confederate littering in a clean environment lead to less littering than when the confederate did not litter in a clean environment; in other words, focusing attention to the anti-littering descriptive norm leads to less littering. However, there was an increasingly greater propensity for subjects to litter as the descriptive norm of the manipulated environment became successively more pro-litter.

Cialdini et al. (1990) further developed these experiments by introducing an injunctive norm component in two subsequent manipulations. In the first of these the confederate either did or did not litter in an environment that was either very littered or where litter had been carefully swept up into a corner. The sweeping of litter was felt to signify an injunctive norm against littering. The results of the experiment indicated that in the absence of a norm-focus trigger, there was a minimal difference between the swept and unswept condition, but that focusing attention on the anti-littering injunctive norm magnified these differences and led to reduced littering in an anti-littering injunctive norm environment. Thus, temporarily drawing attention to a restrictive injunctive norm would seem to have the potential to outweigh the influence of a more permissive descriptive norm. The importance of focusing on injunctive norms was further emphasized in a fifth experiment in which descriptive norms were not considered or manipulated, but which found that subjects were less likely to litter when presented with an anti-littering injunctive norm message, and that presenting the subjects with injunctive norm messages that were progressively less relevant to the issue of littering resulted in progressively more littering behaviour.

The power of injunctive norms was highlighted in subsequent experiments by the same research team (Reno et al., 1993). In the first of these experiments, consistent with the prior work, both injunctive and descriptive norms suppressed littering when the environment was clean but only injunctive norms did so when the environment was littered. The researchers also uncovered what might be termed a trans-situational influence of injunctive norms. In subsequent experiments in which attention was drawn to an anti-littering injunctive norm, subjects complied with this anti-littering norm by littering less frequently in an environment different to that in which they received the injunctive norm message. However, descriptive norms were found to lack this trans-situational influence, with subjects only complying with the descriptive norm when in the same context or environment in which the descriptive norm had been made salient. There is a sound theoretical rationale for these findings. Descriptive norms seem to communicate effective behaviour in a particular setting. However, because injunctive norms communicate generalized values or indicate what is generally socially acceptable within a particular culture, these norms have a trans-situational relevance. Subsequent experiments have reinforced these findings and also presented evidence that personal norms can also strongly guide behaviour, but only when made salient for the individual at the time of the behaviour (Kallgren et al., 2000).

Theory of Normative Social Behaviour

An alternative and complementary approach, the Theory of Normative Social Behaviour, has been developed by Rimal and colleagues in an attempt to understand more clearly the

precise mechanisms through which norms influence behaviour (Lapinski and Rimal, 2005; Real and Rimal, 2007; Rimal, 2008; Rimal and Real, 2003, 2005; Rimal et al., 2005).

The theory suggests that the relationship between descriptive norms and behaviour is extremely complex and that injunctive norms, outcome expectancies, group identity, behavioural identity (Rimal, 2008) and peer communication (Real and Rimal, 2007) moderate the relationship between descriptive norms and behaviour and that injunctive norms and outcome expectancies partially mediate the relationship.

The importance of injunctive norms in the relationship between descriptive norms and behaviour is intuitive. Perceiving that many peers engage in a particular behaviour sends a strong cue that the behaviour is socially acceptable and that the behaviour may be important for peer group membership. Behavioural expectancies, the other mediating variable between descriptive norms and behaviour, are defined as beliefs that one's actions will lead to benefits that one seeks (Bandura, 1986). There is a significant literature indicating that outcome expectancies strongly influence behaviour (Brown et al., 1980; Neighbors et al., 2003; Read et al., 2004; Wood et al., 2001). The importance of outcome expectancies in the norms−behaviour relationship is also axiomatic. If individuals perceive that a particular behaviour is common, then it is likely that it is a behaviour that provides benefits to those who practice it and one is likely motivated to practice that behaviour in order not to miss out on the perceived benefits (Abrams and Niaura, 1987). Of course, part of the benefits associated with a behaviour may be peer-oriented rather than behaviour-oriented: for instance, positive emotions can result from peer acceptance (Christensen et

al., 2004) and sanctions (real or imagined) can be avoided by complying with norms (Bendor and Swistak, 2001).

Group identity refers to the degree to which one considers oneself to be, or aspires to be, similar to a particular reference group. In the absence of some affinity with the group, there is no reason to believe that it would exert any influence on personal behaviour. Any one individual may have numerous different reference groups and Borsari and Carey (2001) have identified 18 such groups that have frequently been used in social norms research. Each reference group may have different descriptive and prescriptive norms and will exert a different type of influence on behaviour, depending on how closely one identifies with the group (Thombs et al., 1997).

The behavioural identity construct measures the degree to which one's self-identity is based around a particular behaviour and the stronger this identification the more likely one is to engage in the behaviour. In one test of the Theory of Normative Social Behaviour, behavioural identity alone accounted for almost 40% of the variance in drinking intentions (Rimal, 2008). Thus, permissive descriptive norms will have a more significant impact on those for whom the behaviour in question is an important part of their self-identity. In practice, however, it is likely that those who are heavily invested in a particular activity will select their peer groups on the basis of this behaviour and thus the most salient descriptive norm will reinforce the behaviour. While not tested in the literature, it would logically appear that behavioural identity and personal norms are closely related – where personal norms are important and are resistant to social influences, the behaviour in question is likely to play an important role in the individual's self-identity.

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The final component of the Theory of Normative Social Behaviour is peer communication, which refers to the degree of frequency with which one discusses a particular behaviour with peers. Interpersonal communication has been shown to be highly predictive of alcohol consumption and to moderate the influence of descriptive norms on behaviour (Real and Rimal, 2007).

2.3.2 Social norms and personal behaviour: conclusions

Based on both the Focus Theory of Normative Conduct and the Theory of Normative Social Behaviour, a number of conclusions can be drawn about the relationship between norms and behaviour. First, norms do exert an influence on behaviour and the strength of this impact will vary according to the circumstances. For instance, when the norm in question is highlighted or made salient to the individual it will exert a more powerful influence. The two theories also reaffirm that there are distinct types of norms, with distinct influences on behaviour. Sometimes these norms can be in conflict with each other, depending on the context, although descriptive and injunctive norms will very often be in alignment with each other, in which case the normative influence on behaviour will be even more significant. Injunctive norms, once they are made salient, seem to have a trans-situational influence, whereas descriptive norms seem to be more context-specific.

The relationship between norms and behaviour is not a simple one and individuals do not automatically copy the behaviour they see around them or immediately comply with what they perceive to be socially acceptable. The complex nature of this relationship has

important implications for social norm marketing campaigns designed to elicit behaviour

change.

2.4 Downstream social marketing: social norms marketing campaigns

The fairly settled consensus that social norm perceptions influence behaviour creates an interesting opportunity for public health advocates to manipulate these perceptions with a view to changing behaviour. There has been considerable growth in the use of these social norm manipulations in the United States since the turn of the century, and the approach has begun to attract attention in Europe and elsewhere.

2.4.1 Normative misperceptions

The basic premise behind the social norms approach is that individuals regularly misperceive the social norm; that it is the misperception – rather than the actual norm – that influences behaviour and that correcting this misperception results in consequent behaviour change.

There is significant evidence from a variety of domains that individuals misperceive the descriptive norms relating to many different behaviours. Most of the work in the field has been focused on student drinking, where significant overestimations have been found relating to the frequency, and amounts, of consumption amongst student peers (Kypri and Langley, 2003; McAlaney and McMahon, 2007; Neighbors et al., 2007a; Perkins et al., 2005; Yanovitzky et al., 2006; see also Borsari and Carey, 2003 for a meta-analysis of almost two dozen older studies). Evidence also exists to indicate that people overestimate descriptive norms around smoking (Agostinelli and Grube, 2005; Bauman et al., 1992; Graham et al., 1991; Shanahan et al., 2004) as well as sexual behaviour (Lamber et al., 2003; Scholly et al.,

2005) and illegal drug use (Hansen and Graham, 1991; Wolfson, 2000). Recent studies have also indicated a misperception of both descriptive and injunctive norms relating to gambling (Larimer and Neighbors, 2003; Neighbors et al., 2007c) and tax evasion (Wenzel, 2005).

One study on student alcohol consumption failed to find any evidence of misperception (Wechsler and Kuo, 2000), although this study has been criticized for using different measures to compare individual and perceived peer norms (DeJong, 2003). It also determined that perceptions of peer behaviour were accurate if they were within 10% of the actual peer norm, although it is not immediately clear why a 10% margin of error should be considered accurate.

In some instances the extent of the misperception can be very significant. In an analysis of the drinking norms of Scottish students, McAlaney and McMahon (2007) reported that 52% of respondents perceived that the majority of the student population got drunk at least twice per week, whereas only 12% of students reported this level of drunkenness. In a large-scale survey of 76,145 students from 130 colleges across the United States, Perkins et al. (2005) found that most students significantly overestimated the drinking norm on their college campus and that this pattern held even where the norm was a heavy drinking one. For instance, on college campuses where the norm was to consume 4 drinks per drinking occasion, 15.4% of students underestimated the norm, 12.6% had accurate perceptions but more than 70% overestimated the norm, with almost 35% of students perceiving that the norm was to consume 7 or more drinks per drinking occasion. Similar patterns of gross overestimation can be found in studies of sexual behaviour. A survey of

more than 28,000 college students in the United States found that 71% of the respondents either abstained from sexual intercourse or had 1 sexual partner within the previous year but the student population itself perceived that most students had at least 3 sexual partners during this time frame (American College Health Association, 2003). Similarly, Scholly et al. (2005) found that students significantly overestimated the prevalence of risky sexual activity and underestimated the frequency of responsible behaviour: 80% of respondents had either 0 or 1 sexual partner within the previous year, but thought that only 22% of the student population were similarly abstemious.

Individuals who misperceive the norm may fall into one of three broad categories of misperception, depending on how they view their own behaviour with respect to the perceived norm. The most common type of misperception is that of *pluralistic ignorance*. This occurs when individuals incorrectly perceive that others behave or believe differently than they themselves do (Prentice and Miller, 1993). Thus, the 71% of students in the previously mentioned American College Health Association (2003) study who had at most 1 sexual partner in the previous year were afflicted with pluralistic ignorance in their belief that most students had 3 or more sexual partners within this time frame. The effect of pluralistic ignorance is to suppress behaviours and opinions that are incorrectly perceived as counter-normative; it also exerts a subtle pressure on individuals to engage more frequently or publicly in the misperceived behaviour. A more unusual type of misperception, *false uniqueness*, can be viewed as a variant of pluralistic ignorance and occurs when individuals who abstain from a particular behaviour incorrectly perceive that their abstention is more unique than it in fact is (Suls and Wan, 1987), perhaps because those who possess desirable attributes tend to underestimate the prevalence of those

attributes (Tabachnik et al., 1983). The effect of this misperception could be to cause these individuals to withdraw from interaction with others, the result of which would lead to even more distorted normative perceptions on the part of the rest of the population, somewhat similar to the process envisaged by the spiral of silence theory (Noelle-Neumann, 1973). *False consensus* occurs when individuals incorrectly perceive that others are like them, when in reality they are not (Ross et al., 1977). Those who possess negative characteristics tend to overestimate the prevalence of those characteristics via a process of attributive-projection (Sanders and Mullen, 1983). This is most likely to occur in situations in which individuals have a vested interest in believing that 'everyone' behaves as they do in an effort to justify their own behaviour. Thus, heavy drinkers, who are more likely to select other heavy drinkers as friends, may incorrectly generalize the heavy drinking norm of their close peer group to the wider society.

There are a number of reasons why misperceptions occur in the first instance. Clearly, the wider media culture plays a role in shaping our perception of reality; this matter will be discussed in more length in section 2.5. In addition to the media, Perkins (2003) points to the sheer visibility and vividness of those who engage in problematic behaviour relative to their more abstemious peers. Those who are, for instance, obviously drunk or violent are very noticeable and the memory of their behaviour sticks in the mind, encouraging others to perceive it as being more normative than it in fact is. On the other hand, those who behave 'normally' – those who are sober and well ordered – do not attract attention in the same way. A somewhat different process can account for false consensus effect misperceptions, where, in the case of alcohol consumption, it seems that a form of cognitive dissonance encourages individuals to develop attitudes and beliefs that are

consistent with their behaviour (Kypri and Langley, 2003; Larimer et al., 2004). It may also be the case that ill-conceived social marketing campaigns which stress the extent of the problem contribute to the normalization of the very ill they were designed to cure (Cialdini et al., 2006).

2.4.2   Correcting misperceptions

The fact that misperceptions of the norm occur is of capital importance for public health advocates and others concerned about behaviour change. Section 2.3 examined an extensive literature demonstrating that social norms influence behaviour. This, of course, is only partly correct. Most people are unaware of what the *real* social norm actually is. Rather it is an individual's perception of the norm – which in a sense, is 'real' for them (Perkins and Wechsler, 1996) – that influences behaviour. If the norm is misperceived, it is this misperception which is the key driver of behaviour (Andrews et al., 2008; Eisenberg and Forster, 2003; McAlaney and McMahon, 2007). Thus, in Perkins et al.'s (2005) study of more than 75,000 students across the United States, a 1 drink increase in the actual norm was associated with a 0.37 drink increase in individual consumption, whereas a 1 drink increase in the perceived drinking norm was associated with a 0.5 drink increase in personal consumption. While the actual drinking norm was an important predictor of behaviour, the perceived campus norm was even more significant and indeed was more important than all other demographic control variables.

The knowledge that normative perceptions impact behaviour and that these norms are often misperceived has given rise to the so-called social norms approach to solving social

problems. The basic tenet of this approach is that if overestimations of problem behaviour can be corrected and lowered – normally through either a social norms marketing campaign or an intervention with individuals (Moreira et al., 2009) – then behaviour will follow.

Advocates of the social norms approach point to a significant body of research which seems to indicate the effectiveness of the method with diverse populations in a variety of behavioural contexts, including alcohol consumption (Perkins et al., 2005, 2010), smoking (Linkenbach and Perkins, 2003), tax compliance (Wenzel, 2005) and adolescent sexual behaviour (Bersamin et al., 2005). Borsari and Carey (2003) and Berkowitz (2005) provide extensive overviews of older studies which indicate successful behaviour change following social norm interventions.

More recently, Moreira et al. (2009) conducted a systematic review of 22 social norm intervention random control trials. These studies involved 7,275 college students and were aimed at assessing the effectiveness of social norm interventions in reducing alcohol consumption. On the basis of their analysis, they concluded that the effectiveness of social norms campaigns depends on the mechanism through which the normative correction is delivered. They found that interventions using the internet or other computer software were more effective at reducing alcohol misuse than the control condition (which often included more traditional educational approaches such as the delivery of an alcohol education leaflet). These effects were more evident over the short term, although there were some residual effects over the medium term (4 - 6 months). There was less evidence of an effect on behaviour if the intervention was delivered in a group or individual face-

to-face setting and the results of the review were inconclusive on the effectiveness of marketing campaigns to correct normative perceptions.

2.4.3   Criticisms of the social norms approach

Despite the robustness of the link between normative perceptions and behaviour and the rapid growth in the use of social norms marketing campaigns, the field is not without its critics. The approach was first developed in the context of student drinking (Perkins and Berkowitz, 1986). The basic message of the approach – that most students drink moderately – was instantly attractive to the alcohol industry, and it provided them with a way of being seen to be proactive in encouraging responsible drinking without having to highlight the negative consequences of alcohol consumption. The fact that the alcohol industry has been involved in funding both social norms research and normative intervention campaigns has made some public health advocates inherently suspicious of the approach. Critics also point to a number of failed social norms campaigns in support of their case (Blumenthal et al., 2001; Clapp et al., 2003; Scholly et al., 2005; Werch et al., 2000), although proponents of the approach argue that such failures have occurred because of poor planning or implementation of the social norms campaign and a consequent failure to correct the underlying misperception in question (Perkins et al., 2005). The evidence supporting the effectiveness of normative interventions is also open to criticism due to the lack of control groups in many instances (Jung, 2003), although more recent studies have incorporated such controls (Perkins et al., 2010).

There are three substantial criticisms of the approach which deserve careful consideration. The first of these relates to the ethics surrounding the so-called boomerang effect, whereby

the minority of individuals who *underestimate* the norm have their misperception corrected, but in an upward fashion, with the potential consequence that they could engage in more risky behaviour. This is not necessarily an insignificant problem – despite the pattern of gross overestimation of the norm by most students found in the large-scale survey of American college students conducted by Perkins et al. (2005), as many as one-fifth of the students in some colleges underestimated the drinking norms of their peers. This problem may be especially acute in contexts where the actual norm in question is itself unhealthy or otherwise problematic, in which case a social norms marketing campaign could conceivably have to promote binge drinking as normative. Indeed, there is a debate about whether misperceptions even exist in normatively unhealthy environments, although proponents of the approach argue that misperceptions will still exist in such contexts (Perkins, 2003), a position supported by the finding of drinking misperceptions amongst Scottish students (McAlaney and McMahon, 2007), a population in which heavy drinking is more normative than in the United States where the theory was first developed.

Schultz et al. (2007) discovered evidence for the boomerang effect in their experimental social norm intervention aimed at reducing energy use amongst householders in California. The householders received information detailing how much energy they had used in recent weeks, as well as descriptive norm information detailing how much the average house had used in their neighbourhood. As expected, over time, those whose energy consumption was above the norm reduced their energy use, but those who were originally below the norm actually increased energy consumption.

The solution to the boomerang effect may be found by resolving the second major criticism of the social norms approach: namely, its almost total neglect of power of prescriptive norms and its over-reliance on descriptive norms (Rimal and Real, 2005). Despite the significant progress that has been made in understanding the complex relationship between different types of norms and behaviour, particularly with the development of the Focus Theory of Normative Conduct and the Theory of Normative Social Behaviour, social norm interventions – with few exceptions (Barnett et al., 1996; Schroeder and Prentice, 1998; Wenzel, 2005) – tend to utilize descriptive norm manipulations only.

Thus, in a context in which descriptive norms may be unhealthy or problematic, it may be possible to incorporate a positive prescriptive norm appeal in order to counteract the boomerang effect. This is precisely what Schultz et al. (2007) did in their experiment with Californian homeowners. A third group in their experiment received, in addition to the previously described descriptive norm message, a prescriptive norm message either conveying approval or disapproval of that householders energy use. Those who consumed below the norm and also received a prescriptive norm message were not subject to a boomerang effect, whereas those who did not receive the prescriptive norm message increased their energy use in line with the descriptive norm.

The use of prescriptive norms in normative intervention campaigns has several benefits, building as it does on the finding from the Theory of Normative Social Behaviour that descriptive norms are mediated via injunctive norms (Rimal et al., 2005) and the insight from the Focus Theory of Normative Conduct that the power of social norms in greatly

enhanced when descriptive and injunctive norms are in alignment (Cialdini et al., 2006). Such an approach also avoids the potential ethical dilemma of inadvertently encouraging the adoption of unhealthy behaviour (Larimer et al., 2004) and may satisfy the concerns of public health advocates uncomfortable with labelling any level of drinking or smoking, for instance, as normative.

The level of misperception, and the relative influence of that misperception on behaviour, also varies significantly from case to case, and the third major criticism of the social norms approach relates to the practicality of harnessing a salient norm which can influence behaviour. There are numerous reference groups that can be used in social norms campaigns; as noted previously, Borsari and Carey (2001) have identified 18 different reference groups common in social norms research, and others can be added to that list. The extent of the misperception increases as social distance increases, while the influence of the misperception decreases with social distance (Borsari and Carey, 2003; McAlaney and McMahon, 2007). This finding is intuitive in the light of the importance of group identity in the Theory of Normative Social Behaviour (Rimal, 2008).

This leaves a dilemma for those trying to harness the power of norms to bring about behaviour change: Which peer group misperceptions should be changed in a normative intervention? The search for the most salient reference group is not an easy one. Social marketers will lack credibility if they try to correct misperceptions about close friends and these groups are so diverse as to make it practically impossible to develop a marketing campaign to correct these misperceptions (Reed et al., 2007). On the other hand, the more general norms which marketers can manipulate exert a considerably weaker influence on

behaviour to begin with. Perhaps this is why the systematic review conducted by Moreira

et al. (2009) found more promising results for online social norms interventions, which can

be tailored to individuals more readily than a marketing campaign can.

More research is needed to understand the role of group salience in normative campaigns

and how they can be harnessed to bring about behaviour change.

2.5   Upstream social marketing: social norms and marketing regulation

Social marketers and others concerned about public health are rightfully intrigued about the possibilities of harnessing the power of normative perceptions to bring about positive change. But social norms have implications that go far beyond these downstream applications. As Goldberg (1995) suggests, social marketers must not confine themselves to fishing people out of the water after they have fallen in; there comes a time when social marketers must move upstream to investigate, and indeed challenge, those influences that encourage people to jump into the water in the first instance.

Such a move upstream would uncover a variety of ecological factors, including laws and social policies, peer, community and family relationships, as well as media and marketing influences, which seem to conspire together to encourage people to 'jump into' the river (Taylor and Sorenson, 2004). Taking just one of these factors, there has been much debate about how marketing, and, more generally, the media, influence potentially unhealthy or socially damaging behaviours such as alcohol consumption (Anderson et al., 2009; see also section 1.4), smoking (Wellman et al., 2006), risky sexual behaviour (Brown et al., 2006) and unhealthy food consumption (Hastings et al., 2006), amongst others. In order to shape the policy debate about the regulation of marketing from a public health perspective, much of this research has attempted to examine the relationship between exposure to marketing and subsequent behaviour. In contrast, the reasons *why* marketing should have such an influence are considered with relative infrequency. Marketing does not operate like a 'magic bullet' whereby individuals automatically adopt the behaviour presented to

them; other intervening cognitive mechanisms are at play (Bandura, 2001). Normative perceptions provide a potentially powerful insight in this regard.

Looking at the issue from another perspective, we now have some degree of certainty that normative perceptions, accurate or otherwise, influence behaviour, but we have much less certainty about where these perceptions come from in the first instance. It is generally accepted that interpersonal communication (Lapinski and Rimal, 2005) and observation (Gunther et al., 2006; Perkins, 2003) contribute to norm formation. While the role of the media in general, and marketing in particular, in norm generation and transmission has been curiously under-researched, it is intuitive that the existence, pervasiveness and content of behavioural portrayals in the media environment helps shape perceptions of reality (Conley Thomson et al., 2005).

2.5.1   Media and marketing may shape social norms

There are two major contrasting theories as to how marketing and the media contribute to norm formation. The first perspective broadly rests on cultivation theory (Gerbner and Gross, 1976), which proposes that media depictions of behaviour, which in practice are often exaggerated distortions of reality designed to entertain and hold attention, shape people's perceptions, often without them realizing it (Bandura, 2001; Lederman et al., 2004). These effects persist even when individuals consciously deny that the media reliably depicts reality (Shrum, 1999; Shrum et al., 1998). The impact of these media effects, in which almost everyone is immersed to some degree or other, is often obscured by their pervasiveness (O'Guinn and Shrum, 1997).

Research on cultivation theory has tended not to analyse media effects through a normative perspective or to use the conceptualizations adopted by researchers in the social norms field. Nevertheless, cultivation theory provides some evidence that the media influences perceptions of behaviour prevalence. Researchers have found that heavy television viewing was positively correlated with perceptions of the prevalence of professions frequently depicted in the media (Gerbner et al., 1994): with greater faith in the medical profession (Volgy and Schwartz, 1980); with higher estimates of the frequency of crime (Gerbner et al., 1977) and with frequency of drug use (Coomber, 1999; Fan, 1996); with perceptions of societal affluence (O'Guinn and Shrum, 1997); and with misperceptions about the frequency of divorce (Carveth and Alexander, 1985). The cultivation approach may also operate to effect prescriptive norms – Shanahan (2004) reports that heavy television viewers have more positive attitudes towards homosexuality and argues that this is in part because of the mainstreaming of homosexuality on television.

The availability heuristic provides one possible explanation for cultivation effects (Tversky and Kahneman, 1973). This perspective suggests that individuals rely on easily accessible information when asked to make social judgments and that they infer that behaviours must be common if they are easily remembered. Relying on this theory, O'Guinn and Shrum (1997) showed that not only did heavy television viewers provide higher estimates of social affluence, but they also responded to the questions more rapidly than light viewers who made lower estimates of affluence, presumably because they were relying on the more cognitively available consumer images which are easily retrieved

from their heavy television viewing. An alternative explanation of cultivation effects is that of the simulation heuristic which suggests that individuals will estimate the prevalence of an event from the ease with which they can imagine it (Kahneman and Tversky, 1982). Given the widespread and often graphic depictions of violence, sex, and drug and alcohol use in the media environment, and the vividness of drunken behaviour on public streets in comparison to the relative 'invisibility' of the sober (Perkins, 2003), the simulation heuristic presents a theoretically plausible explanation of norm formation pathways.

An alternative explanation to that of cultivation theory is the theory of presumed influence. This is largely based on the third-person effect whereby individuals assume that the media will influence others much more powerfully than it will influence themselves (Perloff, 1993), especially when the effect is likely to be negative in nature (Gunther and Mundy, 1993). This presumption of influence on others elicits a behaviour change in order to bring personal behaviour into line with the media's presumed influence on others.

Gunther et al. (2006) conducted a study of smoking-related media to test the presumed influence theory. They found that the more respondents were exposed to pro-smoking media content, the more they thought that their peers were subjected to similar influences. This presumption was linked with higher estimates of peer smoking. There are two pathways of influence by which this relationship can be explained. The most logical, and intuitively satisfactory path, is similar to the cultivation theory and suggests that the media provides a set of representative cues indicating peer norms on smoking. However, the researchers found that this pathway was not significant for the relationship between

anti-smoking messages and perceptions of prevalence, although the relationship between pro-smoking messages and prevalence was significant. On the other hand, it was the presumed influence pathway, whereby respondents matched their perceptions with their presumption of the influence of the media on peers, that most closely fit the data.

The two pathways, although similar, are different in subtle and important ways. The presumed influence pathway proposes what appears to be an unlikely approach through which individuals estimate the effects of the media on others and adapt their normative estimates, and ultimately their behaviour, to match this. This latter approach was supported in two subsequent studies on the relationship between media exposure and sexual norms and behaviour in which the presumed influence pathway was more significant than the cultivation approach (Chia, 2006; Chia and Gunther, 2006) as well as in a study of advertising exposure and materialistic values amongst adolescents in Singapore (Chia, 2010).

As previously noted, a considerable body of evidence suggests that marketing influences both smoking (Wellman et al., 2006**)** and alcohol consumption (Anderson et al., 2009). That carefully designed commercial communications should achieve its objective of persuading its target audience to consume is unsurprising. However, there is also a growing literature indicating that movies and other forms of entertainment exert an influence similar to that of commercial advertising (Distefan et al., 2004; Hanewinkel et al., 2008; Sargent et al., 2006; van den Bulck and Beullens 2005; Wills et al., 2009). Some of this influence may be explained by product placement strategies, which are deliberately designed to influence consumption (Wasko et al., 1993). However it seems probable that this influence can also

be explained through normative mechanisms. In other words, media and marketing depictions provide clues to the prevalence and/or social acceptability of certain behaviours in the real world and may mediate the relationship between marketing and behaviour. With a few exceptions that are situated in other behavioural contexts (Brown and Moodie, 2009; Chen et al., 2006; and the previously cited work on the Theory of Presumed Influence), this issue has rarely been formally assessed with the generally accepted conceptualizations and definitions of norms outlined in this chapter. However, many theorists have hinted at the probability of such a link between marketing and norms (Beck and Treiman, 1996; Lapinski and Rimal, 2005; Lederman et al., 2004; Spijkerman et al., 2007; Taylor and Sorenson, 2004; Wakefield et al., 2003; Yanovitzky and Stryker, 2001). As Chen et al. (2006: 360) cogently argue in the context of tobacco advertising:

In addition to their direct effects on tobacco use, tobacco advertisements and promotion activities may also serve as data for adolescents to modify their perceived smoking norms, which in turn, may affect their smoking behaviour. If this were the case, adolescents who have been exposed or have increased receptivity of pro-tobacco media may be more likely to perceive that there are more peer smokers around them: therefore, these adolescents would be more likely to smoke themselves. Thus, there may be a linkage from pro-tobacco media to perceived smoking norms, and further, to actual tobacco use among adolescents.

The power of the norms-behaviour link is not lost on commercial marketers. Alcohol marketers have long understood the importance of social networks and relationships. For this reason, alcohol is regularly advertised, directly and indirectly, as a social lubricant. One brand, Carling, has even gone as far as to make powerful appeals to the concept of

'belonging' to a group, prominently using the word 'Belong' in the same format and style as its logo (Hastings et al., 2010).

This effect may not be limited only to the influence of marketing on descriptive norms. The mere fact that a product can be openly marketed communicates something about its social acceptability, and thus may help to shape injunctive norm perceptions (Brown et al., 2009; Lapinski and Rimal, 2005; Wakefield et al., 2003). The potential for impacting injunctive norms is also apparent when commercial operators get involved in social marketing, for example tobacco companies running youth prevention campaigns or drinks companies funding moderate drinking initiatives. In the latter case, there is good evidence to show that such efforts benefit the reputation of the sponsoring company more than they do public health (see, for example, Hastings and Liberman, 2009; Hastings and Angus, 2011; Wakefield et al., 2005, 2006). In the process there is a clear danger that mixed messages are communicated, especially to impressionable or vulnerable young people. After all, if those who produce and market alcohol are also the guardians of public health, it is easy to assume that they have our best interests at heart…

2.6   Conclusion

Social norms have important implications for marketers which are unfortunately commonly overlooked. Based on the evidence we have to date, we can conclude with reasonable certainty: (i) that norms powerfully influence behaviour, often to a greater extent than other important demographic factors; (ii) that norms are regularly misperceived; and, finally, (iii) that correcting these misperceptions has the potential to bring about positive behaviour change. The last conclusion, about the power of harnessing norms, is of great significance for social marketers engaged in typical 'downstream' activity. Too often, norms have been harnessed in precisely the wrong fashion by social marketers. Too much emphasis on the extent of a problem, rather than on positive role models, may inadvertently reinforce the unhealthy behaviour by implying that 'everyone' is doing it.

Perhaps norm-based campaigns have been ignored by some social marketers because of a legitimate concern about the role of commercial marketers in funding both research and normative campaigns to change behaviour. It is understandable that public health advocates are inherently uncomfortable supporting a campaign that tells young people that drinking alcohol or smoking, for example, are normative.

This is why the most recent theoretical advances in social norm research, and particularly the Focus Theory of Normative Conduct and the Theory of Normative Social Behaviour, are of such significance. This work makes clear that it is only by using *both* descriptive and prescriptive norms that we can best harness their power. It is understandable that the

alcohol industry, for example, is less interested in sponsoring campaigns that communicate social disapproval of binge drinking than it is of paying for campaigns informing the public that consumption is normative amongst their peers. The capacity to align norms relating to prevalence with norms relating to social acceptability should renew the interest of social marketers in the downstream applications of norms.

There are perhaps even more exciting opportunities in the field of normative perceptions for social marketers concerned with 'upstream' interventions and research. While much work has been done in examining the influence of marketing and the media on a variety of socially problematic behaviours, most of this has been at the level of dose-response relationships. Examining social norm perceptions, their origins and formation pathways via exposure to marketing presents a potentially fruitful field of research. Even at a basic commonsense level the importance of the relationship between norms and marketing is evident – the mere fact that it is legally and socially acceptable to market certain products, irrespective of the content, timing or targeting of that marketing, clearly communicates the social acceptability of the product in question. This acceptability is likely to be reinforced when the makers of these products also get involved in educating people about public health, with concomitant benefits for their corporate reputations. Serious policy implications with respect to the regulation and control of marketing may flow from innovative and creative research on these upstream aspects of social norms.

The remainder of this thesis is dedicated to exploring the implications of social norms in an Irish context, and in particular to considering the role of social norms as an indirect pathway that explains in part the influence of alcohol marketing on consumption. Finding

an indirect pathway from marketing to behaviour via norms will in part address the question of *how* and *when* marketing influences alcohol consumption, and also test the industry argument that the influence of marketing doesn't matter because of the power of peer influence.

Chapter 3: Methodology

3.1 Introduction

Data was collected by means of an online questionnaire that was administered to undergraduate students of the Dublin Institute of Technology in Ireland. The questionnaire was pretested by means of an initial round of cognitive interviews and a subsequent pilot test, and the final questionnaire was hosted and built using the Bristol Online Surveys software product.

This chapter outlines the decisions that were made at each step of the study design and data collection process. In particular, it outlines the three core Research Propositions and supporting hypotheses that were tested in this research. A further 5 secondary Research Propositions were tested – in order to maintain the narrative focus on the core issues of marketing, perceived norms and alcohol consumption, the 5 related but secondary issues (which examine issues relating to normative misperceptions and attitudes towards non-drinkers) are detailed in Appendix II. The chapter also outlines the rationale for choosing a sample of students in the Dublin Institute of Technology, provides a comprehensive overview of the issues surrounding online data collection as well as a justification for the measures used in the online survey. Finally, the chapter reviews the two rounds of pretesting and discusses the practical steps involved in data collection.

3.2   The aim of this research

Chapter 1 has reviewed the literature on the relationship between alcohol marketing communications and alcohol consumption. Consensus has grown around the proposition that alcohol marketing communications contribute to greater levels of alcohol consumption. This consensus has been bolstered by recent longitudinal studies and systematic reviews which more readily allow for testing cause and effect relationships. This consensus has led to two related debates that form the basis of this thesis.

In the first instance, given the increasing clarity around the question of *whether* alcohol marketing influences consumption, there is a need for more research to examine *how* and *when* this occurs. Secondly, in response to the growing certainty around the role of marketing in influencing alcohol consumption, the industry has argued that peer influences are of greater importance, and that compared to peers that marketing is of little consequence.

In an effort to simultaneously address both of these issues, Chapter 2 has comprehensively examined the literature on social norms theory. Norms are a well established construct that play a prominent role in several important sociological theories and frameworks. Recent work has brought much clarity to social norms theory, including (i) the importance of social norms in shaping human behaviour; (ii) the complex interactions between different types of norms and (iii) the phenomenon of misperceived social norms, especially with respect to alcohol, tobacco and other health related behaviours.

In reviewing the social norms literature, two significant implications for marketers were identified. In the first instance, there are *downstream* implications for social marketers from social norms theory. By correcting misperceived social norms it may be possible to bring about positive behaviour change as individuals adjust their behaviour to align with a more accurately perceived norm. Much work has been done in the United States to examine this phenomenon, and this work is increasingly supplemented by researchers from other cultural contexts. Ireland is characterised by a heavy drinking culture in which the legal drinking age is 3 years lower than the United States. It is an interesting, and valuable, contribution to the academic literature to examine the phenomenon of misperceived norms in the Irish drinking culture.

But Chapter 2 also identified a potentially more promising set of *upstream* implications that are directly germane to the alcohol marketing debate. Instead of intervening to save those who have already fallen into unhealthy behaviours and habits, might it be possible to move upstream and utilise social norms theory in order to prevent people from adopting potentially harmful behaviours in the first instance? If alcohol marketing communicates something about the social acceptability and normality of alcohol consumption, then marketing may have an indirect influence on behaviour via its impact on normative perceptions. If this is the case, it will tell us something about *how* and *when* alcohol marketing influences consumption, and it will simultaneously undermine the industry argument that it is peers that matter and not marketing, precisely because peer influence would be a conduit through which some of the power of marketing could influence young people.

Significantly, while much work has been done on the downstream applications of social norms theory, surprisingly little has been done in exploring the potentially more fruitful upstream implications. Establishing a potential mediating role for social norms in the relationship between alcohol marketing communications and alcohol consumption would add to both social norms theory and the theory surrounding alcohol marketing and marketing communications more generally. In the policy domain, it would strengthen the argument for tighter restrictions, or even a ban, on alcohol marketing communications. Significantly, it could underpin a significant research agenda in testing this theory about the role of peer norms as an indirect pathway of marketing influence in other cultures and other behavioural contexts.

These research aims are more fully enumerated in eight Research Propositions each of which is tested with a number of hypotheses. The first three core Research Propositions are outlined in this chapter and the remaining five secondary Research Propositions are discussed in Appendix II.

3.3   Overview of core Research Propositions and hypotheses

3.3.1   Research Proposition 1: Consumption of alcohol marketing communications will be related to consumption of alcohol.

There is a significant body of literature examining the relationship between alcohol advertising and alcohol consumption (see section 1.4 for a review). This body of knowledge has been strengthened in recent years through longitudinal studies and systematic reviews that can more readily identify causal relationships (Anderson et al., 2009). However, much of this work takes a rather one-dimensional view of marketing, tending to focus primarily on advertising which, while important, is still only one sub-component of one element of the wider marketing mix (Borden, 1965). With relatively few exceptions (e.g. Gordon et al., 2011; Jones and Magee, 2011; Lin et al., 2012; Pinsky et al., 2010; Tucker, Miles and D'Amico, 2013), the relationship between the cumulative impact of the wider marketing mix and alcohol consumption does not seem to have been the subject of much investigation. This would seem to be a significant oversight in the context of marketing campaigns that are integrated in nature and increasingly underpinned by innovative social media initiatives. Furthermore, there is little quantitative research on the effects of alcohol marketing in the Irish context. One recent study (Delaney, Harmon and Wall, 2008) which examined Irish student consumption of alcohol examined the potential influence of numerous demographic and socio-economic factors on consumption, although marketing and advertising were conspicuous by their absence from this analysis. Interestingly, this study was funded by Diageo.

Research Proposition 1 is tested with the following hypotheses.

- H1a: Increased exposure to alcohol marketing communications will predict increased frequency of drinking alcohol.

- H1b: Increased engagement with alcohol marketing communications will predict increased frequency of drinking alcohol.

- H1c: Increased engagement with online alcohol marketing communications will predict frequency of drinking alcohol.

- H1d: Increased exposure to alcohol marketing communications will predict increased frequency of drinking alcohol to get drunk.

- H1e: Increased engagement with alcohol marketing communications will predict increased frequency of drinking alcohol to get drunk.

- H1f: Increased engagement with online alcohol marketing communications will predict frequency of drinking alcohol to get drunk.

The reasons for the use of measures such as *exposure to alcohol marketing communications*, *engagement with alcohol marketing*, *frequency of drinking* and *frequency of drinking to get drunk* are outlined in detail in section 3.7.

3.3.2 Research Proposition 2: Different types of social norm perceptions will be independently related to behaviour

Much of the recent progress in the study of social norms has its origins in the so-called social norms approach to behaviour change. As discussed in Chapter 2, much of this body of work examines the influence of descriptive norm manipulations on behaviour change processes. However, one of the criticisms of this field is that it is essentially a *descriptive norms* approach as opposed to a *social norms* approach as many researchers harness only descriptive norms in their behaviour change processes. Recent work on the Focus Theory of Normative Conduct (Cialdini et al., 2006) and the Theory of Normative Social Behaviour (Rimal, 2008) has suggested that descriptive and prescriptive norms are distinct sources of influence. Indeed, even theorists who acknowledge the distinction between descriptive and prescriptive norms often fail to distinguish between injunctive and subjective norms, the two constituent types of prescriptive norms (Neighbors et al., 2007b). No published studies have been uncovered which have examined the individual influences of different types of norms in the Irish context.

Research Proposition 2 is tested with the following hypotheses:

- H2: Perceived descriptive, injunctive and subjective norms will each be independently associated with frequency of drinking alcohol to get drunk.

3.3.3 Research Proposition 3: Perceived norms will partially mediate the relationship between alcohol marketing and alcohol consumption.

This research proposition is the basis for the primary contribution of this study to the theoretical literature. While there is substantial consensus around the idea that social norm perceptions influence behaviour, there has been surprisingly little research on where these normative perceptions come from in the first instance. Similarly, while there is growing consensus that alcohol marketing is causally related to consumption, there is a need for research to better understand *how* this relationship develops. Discovering whether perceived norms mediate the relationship between alcohol marketing and consumption would provide important insight into the antecedents of perceived norm formation and also indicate one path through which marketing influences alcohol consumption. Further, it would test the alcohol industry argument that marketing doesn't matter because of peers.

Research Proposition 3 is tested with the following hypotheses:

- H3: Perceived descriptive norms will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol

- H3b: Perceived descriptive norms will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk

- H3c: Perceived injunctive norms will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk[1]

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[1] Due to the way in which injunctive norms were measured, they are only associated with frequency of drinking to get drunk, and not frequency of drinking as in the case of descriptive norms.

3.3   Philosophical assumptions

This thesis is fundamentally concerned with the theoretical and practical problem of *how* and *when* alcohol marketing influences consumption, and in particular with testing the theory that perceived social norms act as an indirect pathway in the relationship between marketing and consumption. It is oriented towards a public policy question of considerable practical importance and is not speculative or purely theoretical in nature. It uses data collection and analytical methods that have been well established in the literature, and wherever novel measures have been used in the research instrument, there is a strong conceptual and practical rationale for them in prior studies.

Nonetheless it remains necessary to briefly outline the philosophical assumptions that underpin this research (Crotty, 1998).

A number of alternative philosophical paradigms are prevalent within the social sciences, including positivism (von Mises, 1951), post-positivism (Popper, 1963), critical theory (Alvesson, 1994) or constructivism (Mir and Watson, 2001), along with related schools of thought and sub-variations within each (Krauss 2005). The assumptions underpinning this work can be traced to the scientific realism proposed by Hunt in his advocacy of the pursuit of truth and realism in research in marketing (Hunt 1990, 1992, 1993; Hunt and Hansen, 2009), and it is part of the dominant philosophical outlook within the marketing academy (Easton, 2002).

The assumptions of scientific realism incorporate elements of classical realism, fallibilistic realism and critical realism and its core assumptions can be summarised in five points: (1) reality exists and is independent of our perception of it; (2) our perception of the world may or may not be accurate; (3) the role of science is to generate knowledge about the world, even if this knowledge may be fallible or imperfect; (4) all such claims to knowledge are subject to critique and investigation to determine their relationship to reality and (5) the longevity of a scientific theory gives reasonable hope that it approximates to reality.

Scientific realism adopts a pluralistic stance on matters of data collection and statistical analysis, and is not wedded to any one approach (Healy and Perry, 2000). However, (Hunt, 1989) argues that certain types of statistical modelling, including those used in this research, necessitate a realist worldview.

3.4   Research ethics

Ethical approval for this research was granted by the DIT Research Ethics Committee. Guaranteeing respondent anonymity – even anonymity from the researcher - was one particular challenge that had to be overcome prior to obtaining ethical approval.

The DIT research ethics guidelines do not mandate strict anonymity in all circumstances (Dublin Institute of Technology, 2013). However, due to the potentially sensitive nature of the research, and the fact that the researcher is a lecturer in the DIT, the research ethics committee were concerned about students revealing potentially private information in a way that could lead to them being identified. This problem was made more acute by the need to collect contact information in order to provide a raffled incentive for participants.

In order to avoid this potential problem, the research ethics committee requested that the raffle be decoupled from the survey in such a way that potentially identifying information would not be connected with the survey responses. The only obvious way that this could be achieved was through the use of a non-identifying code that was emailed to the researcher upon completion of the survey in order to enter the draw. The procedures used to adapt to the research ethics restrictions are detailed in section 3.9 below.

These restrictions on data collection limited the study to a cross-sectional design, and precluded the use of a longitudinal approach. Following a cohort of students over two (or even three) waves of data collection would have necessitated gathering some personally identifying information from students to allow for follow-up, and this was not possible

given the DIT Research Ethics Committee's concerns over the researcher's position with students. In any event, this restriction is not fatal given the preponderance of cross-sectional mediation studies in the academic literature (Iacobucci, 2008), and the desirability of initially testing the plausibility of the proposed mediation relationships before a larger longitudinal study is conducted.

3.5   Sampling strategy

Data was collected from students of the Dublin Institute of Technology (DIT). The DIT is one of the largest educational institutions in Ireland with more than 18,000 students, representing 9% of the total third level student body in Ireland. It offers academic awards from undergraduate certificate level through to PhDs, as well as bespoke corporate training and consultancy services. It is divided into 4 constituent colleges or faculties (Arts and Tourism, Engineering and Built Environment, Science and Health, and Business) and a number of research institutes and centres. It is currently located in more than 30 buildings across Dublin city, although work has recently commenced on the development of a single unified campus in the north inner city of Dublin.

The decision to use a sample of DIT students was informed by a combination of practical and theoretical reasons.

In the first instance, the researcher is a lecturer in the DIT. This made negotiating access to students somewhat more straightforward, although this was not an automatic process. In a context in which students are becoming somewhat fatigued with frequent survey requests, and in which educational institutions are becoming more reluctant to facilitate access to students, this was a significant factor in the decision to locate the research within the DIT.

Notwithstanding the merely practical advantages, there are significant theoretical justifications for the use of student samples for this research. There is a long tradition of

research with student populations in alcohol policy and especially in social norms (see Borsari and Carey 2001, for a review of some of this work). Using similar samples to that used in prior work facilitates comparisons with this prior research.

More importantly, student samples are especially fruitful for research on alcohol consumption because of the prominent role that alcohol plays in student social life, particularly in Ireland (Delaney, Kapteyn and Smith, 2013). Student samples are even more important in relation to social norms research. College students can be subjected to peer pressure just like younger adolescents, but often this pressure is more subtle in nature and originates in a desire to conform to perceived normative stereotypes (Pool and Schwegler, 2007). This is often fuelled by the social anxiety that characterises the transition from the relative security of school to the relative uncertainty of university life (Neighbors et al., 2007a). Furthermore, as teenagers get older, the influence of parents and family gradually wanes, while the influence of peers steadily grows (Brown, Dolcini and Leventhal, 1997), a process that is expected to intensify during college.

The use of a student sample from within one institution provides access to a relatively homogenous group of individuals whose interaction through extended social networks helps to shape perceived drinking norms within that institution (Berkowitz, 2005). It is possible for students to estimate a perceived norm for drinking amongst their college peers, and by averaging the actual consumption of respondents, it is also possible to approximate an actual norm for alcohol consumption amongst students in that institution (Perkins et al., 2010). Comparing the perceived and actual norm of student drinking allows for estimates of misperception to be generated (Perkins, Haines and Rice, 2005).

While not impossible, this process is considerably more difficult and costly with non-student samples.

Many social norms studies focus on one single university precisely because the perceived and actual norms of that university campus are key variables in the analysis. In what might be termed "pure" social norms studies that only investigate misperceptions, multiplying the number of institutions in the analysis would not result in a larger sample size precisely because the samples could not be mixed in an analysis when the key variables are situated within the respondents' own college campus. Accessing multiple institutions would have necessitated a multiplicity of separate analyses for Research Propositions 5, 6, 7 and 8. While such an approach could be valuable depending on the research question (see Perkins et al., 2005 for an example), it would require a large sample in each of the institutions precisely because samples in misperception studies cannot be combined into one overall analysis. Furthermore, it was not necessary to access multiple institutions in order to address the research propositions being investigated in this thesis.

Samples from multiple institutions could have been combined when analysing Research Propositions 1, 2, 3 and 4. However, the aim of the study was not to generalise to all students, but rather to explore the existence of a particular mediation relationship, and as such a multiple institution sample was not necessary. This decision was also informed by the existing large sample of more than 1,000 DIT students, as well as the additional practical, institutional and financial hurdles in accessing samples in more than one institution.

3.6   Online research

Just as in the choice of a student sample, the choice of an online data collection strategy was informed by a combination of practical and theoretical reasons. Online data collection is now well established and respected, although some trade-offs are necessary given the weaknesses associated with the method.

3.6.1   Online research is an established phenomenon

Online data collection techniques are not new - the first emailed surveys were distributed as early as the 1980's, and the first web based surveys were administered in the 1990's (Schonlau et al., 2001). In the intervening years online research has become a well-established feature of both the academic and commercial researcher's toolkit. The Web Survey Methodology website, a repository of data and information about online research, contains a continuously updated database of over 5,500 published articles and conference presentations, either specifically on methodological issues in online research or else reporting results based on online data collection techniques. Furthermore, the site lists almost 400 different online survey software tools available for use by researchers (www.websm.org). As further evidence of the field's maturity, a search of academic research databases reveals over 50 published meta-analyses covering almost every facet of online research methods.

The acceptability of online research is also evident within the sphere of commercial market research. In 2011, 28% of all commercial research in the United Kingdom was

conducted online, and in Japan a remarkable 40% of research was conducted through web based methods. Globally, an average of 22% of total commercial market research investment was spent on online methods, significantly more than the 11% spent on face to face research and the 13% spent on telephone surveys (Bowman, 2012). The World Association for Social, Opinion and Market Research has produced a guide to online research ethics (ESOMAR, 2011). Online surveys are now firmly established as a methodologically sound approach to data collection and their popularity is likely to grow due to technological advancements in social media (Hill and Dean, 2011) and smartphone use (Stapleton, 2012).

3.6.2   Strengths of online data collection

Online research methods have achieved this rapid growth in both the academic and commercial spheres because of their unique advantages with respect to data collection. Evans and Mathur (2005) provide a comprehensive list of advantages associated with the use of online surveys. Particular benefits of web surveys in the context of the present research include the following:

<u>Speed</u>

The ability to gather data in a fast and efficient manner is amongst the key advantages of web based survey techniques (Rasmussen, 2008). The survey used to gather data for this research was publicly available online for a period of 4 weeks, although over 50% of responses were received within the first week. Gathering this quantity of data would take considerably longer using offline techniques. In the context of the present research, the

advantages of speedy data collection are not limited to mere efficiency and convenience, but potentially confer significant benefits in terms of data quality. The risk of a major, high profile new alcohol marketing campaign being launched during the process of data collection necessitated shortening the collection stage – obvious analytical problems could have arisen with an elongated data collection phase if a major campaign targeting college students was launched midway through data collection.

Convenience for respondents

In contrast to personal intercept or telephone surveys, online questionnaires allow respondents to provide data at a time that is convenient for them, and in a context in which they may be more relaxed and capable of concentrating on their answers (Hogg, 2003). Furthermore, the ability to submit data with the click of a mouse removes the burden of physically posting an envelope. In the context of a generation of "born digital" consumers (Palfrey and Gasser, 2008) for whom online interaction is second nature, such conveniences are likely to be significant.

Elimination of data entry errors

In common with many other high-end web survey platforms, Bristol Online Surveys, which was used in this research, combined a capacity for basic descriptive analysis with a facility to seamlessly export results to other statistical software programmes for more detailed analysis. Quite apart from the cost and time benefits of not having to input tens of thousands of coded answers in a statistical software package, the ability to automatically export data eliminates the potential for human error associated with large scale data entry projects (Blank, 2008).

<u>Low cost</u>

Online data collection techniques eliminate the need for phone calls, printing and postage costs. The cost associated with offline data collection is normally directly proportional to the sample size, whereas with online techniques there is little or no marginal cost associated with increased sample sizes (Dillman, 2000). Advanced web survey software with facilities for data analysis and exporting can be expensive, although in most instances the cost is likely to be significantly lower than the costs associated with traditional data collection approaches. In the context of the present research, Bristol Online Surveys was available for free under a campus site licence.

<u>Control of answer order</u>

In common with personal and telephone interview techniques, but in contrast with traditional mailed surveys, online questionnaires can impose a degree of control in the order in which respondents are exposed to survey questions. This prevents respondents from being biased or contaminated by questions that appear later in the survey, and it also creates a degree of uniformity of engagement with the survey across the sample that is not possible with postal questionnaires (Best and Krueger, 2008; Hewson and Laurent, 2008). In the present research, respondents' answers were definitively submitted to the database when they clicked to proceed to the next page and it was not possible to return to previous pages to revise submitted answers.

<u>Controlled question completion</u>

Online survey software can be programmed to make questions mandatory, resulting in a significant reduction in the rate of missing data. Pen and paper surveys on alcohol consumption amongst young people have reported missing item rates of up to 6% (Kypri et al., 2002). In addition, the number of responses that participants can give to multiple choice questions can also be controlled, eliminating the incidence of answers that are not capable of ready statistical analysis because of multiple, and potentially mutually exclusive, answers.

Enhanced question routing processes

Online questionnaires can be designed with advanced "skip logic" features so that respondents are presented with only those questions that are relevant for them. However, one of the unusual defects with the Bristol Online Surveys platform was that follow-on question branching was only available for dichotomous or multiple choice questions and not for follow-on grid questions. This was problematic when it came to the Regan Attitudes Towards non-Drinkers Scale (Regan, 2011) which had to be tailored specifically for non-drinkers. It was possible to work around this problem by designing a questionnaire for drinkers and for non-drinkers and routing respondents to the appropriate version at the start of the process (see section 3.9).

Privacy and honesty

Perhaps the most significant advantage of an online questionnaire for this research was the added privacy and confidentiality associated with the approach (Hewson and Laurent, 2008). Several studies have confirmed the appropriateness of online approaches in a context of potentially sensitive data or private behaviours (Griffiths, 2010; Kreuter, Presser

and Tourangeua, 2009; Turner et al., 1998). Issues of privacy were particularly salient in a context in which respondents were expected to answer potentially sensitive questions about their personal frequency of drinking to get drunk. These concerns were particularly acute given that the researcher was a lecturer in the same institution. Indeed, the DIT Research Ethics Committee was particularly concerned about student privacy and the risk that respondents could be identified through entering a competition for an iPad (see section 3.4). It is unlikely that ethical approval could have been achieved if the data collection process did not provide a guarantee of anonymity and privacy for student respondents, and online data collection was the most appropriate method to guarantee this.

3.6.3   Weaknesses of online data collection

No approach to data collection is perfect, and despite the many advantages associated with online survey research, there are, inevitably, certain limitations. As with every decision in data collection and analysis, a careful balancing act may be necessary between the potential advantages and disadvantages of any one technique.

Some of the most common limitations of web surveys, such as inexperienced respondents and incomplete sampling frames (Evans and Mathur, 2005), were not germane to the current research. Most college students have grown up with a deep familiarity with the online environment – a web survey is just one more type of digital interaction and is unlikely to faze them in any way (Palfrey and Gasser, 2008). Similarly, a complete sampling frame was available for this research through the official DIT student email list.

Furthermore, technological advances have all but eliminated some of the historic limitations of online surveys. Faster computer processors and improved access to broadband and 3G networks have practically erased the frustration typically associated with slow downloads of internet surveys (Ray and Tabor, 2003). Indeed, such limitations were most unlikely to feature given the high speed IT networks available in DIT.

However, in a rather perverse fashion, the absence of the above limitations has itself created a specific challenge with online research. The proliferation of web survey requests has engendered a fatigue with online questionnaires as respondents receive increasingly frequent requests to participate in online surveys (Lee, Fielding and Blank, 2008). This is especially true in the case of research with students. College students were central to this research, both because of the special public health challenge inherent in student drinking and because of the need for a homogenous sample which would allow for the calculation of a potentially salient misperceived social norm. However, for other researchers, students are a sample of convenience, and as a result they receive a disproportionate number of requests to participate in research. This is further compounded by the frequency with which undergraduates target each other for data for undergraduate research dissertations. Indeed, in the months immediately after the collection of data for this research, the DIT imposed extra limitations on survey requests with the general student population.

One of the most significant consequences of frequent requests for survey participation is the phenomenon of declining response rates (Fan and Yan, 2010, Fricker et al., 2005; Vehovar and Lozar Manfreda, 2008), with online data collection approaches now

obtaining response rates between 6% and 15% lower than other data collection modes (Lozar Manfreda et al., 2008).

The problem of declining online survey response rates is further compounded by increased rates of survey non-completion and roll-off (Best and Krueger, 2008; Galesic and Bosnjak, 2009), presumably resulting from survey fatigue and boredom.

3.6.4 Online surveys – a need for trade-offs

While online surveys provide very real advantages in terms of privacy, data quality and speed of turnaround, they are also victims of their own success (Rasmussen, 2008), the net result of which is respondent fatigue, non-completion and low response rates, as previously noted. This necessitates a number of trade-offs between data quality and quantity.

Of significance in this regard is the relationship between questionnaire length and response rates. While some researchers have found no relationship between questionnaire length and response rates (Cook, Heath, and Thompson 2000; Sheehan 2001), many others have, both with offline (Heberlein and Baumgartner, 1978; Yammarino, Skinner and Childers, 1991; Edwards et al., 2002) and online (Crawford, Couper, and Lamias, 2001; Deutskens et al., 2004; Marcus et al., 2007) data collection modes.

Furthermore, Galesic and Bosnjak (2009) found that not only were response rates influenced by survey length, but so too was data quality – respondents were more likely

to skip questions, give short answers to open ended questions and were also more likely to choose "don't know" options in multiple choice questions if they were positioned towards the end of the questionnaire. Taken as a whole, the evidence seems to suggest that response and completion rates are maximised with short questionnaires that do not impose a heavy burden on respondents (Galesic, 2006).

These effects seem likely to be more acute with college students due to both the mode of data collection and the specific characteristics of the sample. For example, Kypri and colleagues (2004) reported that some of their sample of New Zealand college students complained about an online survey that took 20 minutes to complete. Furthermore, there is considerable debate amongst educational theorists about the alleged declining attention span of third level students who have been immersed in a multitasking, multimedia digital environment from their early years (Bennett, Maton and Kervin, 2008). Controversially, some theorists maintain that frequent engagement with computers at an early age can result in structural changes in the brain which in turn lead to altered concentration patterns (Prensky, 2001), and teaching and learning strategies are evolving to accommodate shortened attention spans. While the specific controversies of that particular debate are beyond the scope of this discussion, the evidence suggests that the best strategy for maximising response rates for online surveys with contemporary college students is to ensure that the questions are interesting for the sample (Ray and Tabor, 2003) and that they do not impose an excessive burden on respondents either in terms of time or of cognitive effort (Brown, 2003).

Based on the above considerations, it was decided that a relatively short online questionnaire which did not impose excessive cognitive burden on respondents was the appropriate mode of data collection for this study.

3.7   Justification for measures used in questionnaire

Having decided on an appropriate data collection technique, it was necessary to design a questionnaire that was appropriate for both the sample and the data collection mode. Both alcohol marketing and social norms have been studied (separately) by numerous researchers across the globe. As such, there are many previously utilised measures that are available for adaptation and use. It was therefore considered unnecessary to conduct exploratory qualitative research for the initial stages of questionnaire design. However, the initial survey instrument was rigorously tested with two subsequent rounds of qualitative research which yielded insights on alcohol marketing and normative perceptions beyond the scope of the initial questionnaire. This qualitative research, along with its contribution to the final structure of the survey, are discussed in detail in section 3.8.

There now follows a detailed discussion of the rationale and justification for questions used in this survey. A copy of the questionnaire, in the form of screenshots of the questions as they actually appeared, can be found in Appendix I.

3.7.1   Marketing measures

Accurately assessing exposure to, or engagement with, marketing is notoriously challenging. There are two broad approaches that have been adopted by researchers in assessing exposure to alcohol marketing communications, namely *opportunity based approaches* and *memory based approaches* (Stacy et al, 2004).

Opportunity based approaches

Opportunity based measures involve inferring the likelihood of being exposed to alcohol marketing from particular behavioural characteristics of the respondents, for example, watching sports or late night programmes on television (Ellickson et al., 2005), reading particular magazines with a high level of alcohol advertising (Collins et al., 2007), visiting grocery stores (Hurtz et al., 2007), or living in a neighbourhood with a high density of outdoor advertising (Kwate and Meyer, 2009; Pasch et al., 2007).

Another way of adopting opportunity based measures is the use of total industry expenditure on alcohol marketing as a measure of exposure to marketing (Dorsett and Dickerson, 1994; Saffer, 2001), an approach generally adopted by econometrics and favoured in alcohol industry sponsored research. See section 1.4.1 for a more complete discussion of this approach.

Opportunity based measures have a semblance of objectivity as they do not rely entirely on self-reports from respondents. But they are not without their limitations. One of the biggest criticisms of the approach is that they measure the *possibility* of being exposed to alcohol marketing, rather than *actual* exposure; this can lead to an overestimation of exposure by researchers. Furthermore, the approach assumes that the *opportunity to be exposed* to marketing is related to *actual exposure i*n the same way across the entire sample. For instance, the mere fact that there are many billboards in a particular geographic region does not mean that respondents notice them or, more importantly, that *all respondents pay equal attention to them*. Furthermore, the supposition that exposure to late night television

programming allows researchers to extrapolate exposure to alcohol advertising is also doubtful in an environment where new technologies allow consumers to skip ads or surf channels during commercial breaks.

Opportunity based approaches fundamentally measure the *quantity* of marketing communications messages respondents have *potentially* been exposed to. This ignores the crucial role that the *quality* and *creativity* of alcohol marketing might play. Not all forms of marketing are equally effective or engaging, and simply counting the quantity of communications messages ignores this reality.

There are also practical difficulties with opportunity based measures. To utilise this approach, researchers need access to particular sources of information, such as total industry expenditure on marketing communications or frequency of advertisements during particular times of the day. Much of this information is unavailable to non-industry researchers in Ireland, and the little information that is available is expensive to acquire. Indeed, the problem is exacerbated in Ireland because of the cross-border nature of Irish media consumption. These challenges are further compounded by the proliferation of new online and ambient channels of marketing communications which appeal especially to young people and have considerably extended the reach of alcohol marketers beyond traditional print and television advertising (Hope, 2009; Winpenny et al., 2012). It is extremely challenging to develop an opportunity based measure that could take account of this growing phenomenon, especially with developments in social media technologies which allow peer to peer sharing of marketing messages.

Memory based approaches

The second approach to measuring exposure to marketing is the use of memory based approaches. This method relies on respondents providing an assessment of their own exposure to, or engagement with, alcohol marketing. This approach has been used by many previous researchers (Fleming, Thorsen and Atken, 2004; Gordon, MacKintosh and Moodie, 2010; Lin et al., 2012; Pinsky et al., 2010; Snyder et al., 2006; Stacy et al., 2004). A variation on exposure recall is the recall of particular advertisements or brands (Grube and Wallack, 1994; Henriksen et al., 2008).

As with opportunity-based methods, measures of marketing exposure that rely on self-reports are also subject to limitations, including a potential for underestimating total exposure due to the sheer ubiquity of alcohol marketing communications.

Based on the acceptability of memory based approaches in the prior literature, and the practical and financial difficulties in using opportunity based approaches (especially with numerous marketing communications channels), it was decided to adopt a memory based approach in this research. It is worth noting that marketers themselves do not primarily assess the effectiveness of their campaigns with opportunity based measures, but rather on the basis of consumer engagement with marketing, which, in many respects, is akin to a memory based approach (Hall, 2002; Hansen, 1995).

Two aspects of the relationship between consumers and marketing were measured – exposure to alcohol marketing and engagement with alcohol marketing.

<u>Exposure to marketing</u> (Questions 9, 10 and 11)

Exposure to marketing was assessed by asking respondents which, if any, of the following 15 different forms of marketing communications they were exposed to within the past week: television advertisements; outdoor advertisements; newspaper and magazine advertisements; special price promotions; signs or posters in shop windows; promotional emails; alcohol branded websites; mobile phone screensavers; computer or smartphone games; clothing with alcohol brand logos; celebrities consuming alcohol; sports sponsorship and sponsorship of non-sporting events.

This approach was based on the work of Gordon, MacKintosh and Moodie (2010) and Gordon et al. (2011), and also supplemented by insights from Hope's (2009) review of alcohol marketing communications channels in Ireland. In their research with Scottish teenagers, Gordon and colleagues asked respondents if they had ever seen alcohol marketing messages in any of fifteen different marketing communications channels. Because the respondents in the present research were somewhat older and more experienced than the respondents in the Scottish study, and thus more likely to have been exposed to many of the different forms of communications across their lifetime, it was felt more appropriate to ask about exposure during *a specified time period* rather than exposure *across their entire lifetime*, an approach that was confirmed during the pretesting phase.

A number of other researchers have adopted this approach of measuring frequency of exposure to marketing across specified time periods. For example, Fleming, Thorson and Atkin (2004) measured self-recalled exposure to alcohol advertising on television, magazines, billboards and radio in a typical week using a 5 point frequency scale. Pinsky

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et al (2010) measured how often in the past 30 days respondents had seen alcohol marketing in a variety of different marketing channels. This was assessed on a 6 point scale from never to more than once per day. Snyder et al (2006) measured self-reported exposure to alcohol advertising on TV, radio, billboards and magazines over the past 4 weeks, assessed across a 4 point frequency scale. Stacy et al. (2004) amongst other measures, asked respondents how many TV advertisements for alcohol they had seen during the past week.

Given the necessity for trade-offs in terms of time and convenience for respondents, and the cognitive burden inherent in accurately recalling the precise frequency of exposure to 15 different types of marketing communications on a multi-point scale, the decision was made to simply ask respondents how many of the listed forms of alcohol marketing communications they had seen during the past week on a simple Yes/No binary scale. This facilitated the development of a scale from 0-15 for the number of alcohol marketing channels that respondents were exposed to within the past week.

Engagement with marketing (Question 6)

When measuring engagement with marketing, respondents were asked to specify which, if any, of a list of 17 different ways they had ever engaged with alcohol marketing. The measures included receiving free samples of alcohol products; receiving free gifts with alcohol logos as part of a promotion; receiving special price offers for alcohol; receiving promotional emails for alcohol brands; forwarding joke emails about alcohol brands; entering a competition run by an alcohol brand; owning clothing with an alcohol brand logo; looking at a website for alcohol brands; downloading a computer screensaver

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featuring an alcohol brand; downloading a smartphone app featuring an alcohol brand; playing a computer game featuring an alcohol brand; watching YouTube or other online videos about alcohol brands or drinking; placing an alcohol brand on a social media homepage; liking an alcohol brand or a bar or nightclub on Facebook; following an alcohol brand or a bar or nightclub on Facebook.

This measure was substantially based on the work of Gordon, MacKintosh and Moodie (2010) and Gordon et al. (2011) with teenagers in Scotland which incorporated 8 different forms of involvement with alcohol marketing. It was supplemented by extra measures of engagement with marketing based on the work of Hope (2009) which mapped young people's exposure to alcohol marketing in Ireland, and was further supplemented by insights gained from cognitive interviews in the pretesting phase, particularly with regard to alcohol marketing within the social media space.

3.7.2   Attitudes towards non-drinkers (Question 12)

Many prior studies on both alcohol marketing (e.g. Austin, Chen and Grube, 2006) and social norms (e.g. Rimal, 2008) have incorporated alcohol expectancies as a covariate which helps to predict alcohol consumption. Alcohol expectancies are defined as expected outcomes associated with alcohol consumption and include enhanced sexual attractiveness, masculinity, social success and relaxation (Young et al., 2006). It has been suggested that alcohol expectancies are causally related to alcohol consumption (see Jones, Corbin and Fromme, 2001 for a review).

There are multiple measures of alcohol expectancies. The most comprehensive is the Alcohol Expectancy Questionnaire (Brown, Christiansen and Goldman, 1987) which consists of 120 items. Even shorter adaptations of the instrument incorporate too many items to make it appropriate for the present online research.

One recent development in the literature is the development of the Regan Attitude Towards non-Drinkers Scale (RANDS) (Regan and Morrison, 2011; 2013) which measures the strength of negative attitudes towards non-drinkers. A number of studies have found that the expectation that consuming alcohol will confer social benefits on drinkers is a key driver of alcohol-related behaviour (Christiansen et al., 1989; Pavis et al., 1997). Further, there is evidence that young people perceive that alcohol marketing communicates the message that alcohol is a social lubricant (Dring and Hope, 2001) and that alcohol marketers specifically tap into such socially-oriented alcohol expectations, despite the regulatory prohibitions on doing so (Hastings et al., 2010).

If alcohol marketing creates a perception of social success for drinkers (Jones and Donovan, 2001), it may also create negative (or less positive) attitudes towards non-drinkers. As Regan and Morrison (2011) point out, individuals may wish to avoid this negative perception about non-drinkers by consuming alcohol themselves.

However, one particular difficulty is that the 11 item RANDS scale was created specifically for use with drinkers, and the questions are phrased in ways that do not automatically make sense for those who do not drink alcohol. Thus, an alternative version of the scale was created for administration to non-drinkers only in which the tense of

some scale items was changed. This change was not intended to alter the meaning of the items but rather to make them intelligible to non-drinkers. These changes were informed by the pretesting process and are discussed below in section 3.8.

All other scale items remained the same, and pretesting, including with non-drinkers, did not indicate any difficulties.

3.7.3 Alcohol consumption (Questions 14 and 15)

There are a number of ways in which personal alcohol consumption can be measured. Researchers who have investigated consumption amongst younger adolescents, or amongst those who are below the legal age of consumption, have tended to use measures of lifetime drinking (Aitken et al., 1988; Collins et al., 2007; Unger et al., 2003). This approach would not be appropriate for use in this research due to the age of the sample and the cultural context of alcohol consumption in Ireland.

A variety of measures of self-reported quantity of alcohol consumption have occasionally been used in prior research. For instance, Gordon and colleagues (2010, 2011) and Connor et al. (2011) asked respondents about the type of alcohol drunk by respondents, the type of container it was in, and how much of the container that they had consumed. Other researchers have asked respondents about the number (but not type) of drinks that they have on a typical night out (McAlaney and McMahon, 2007; van den Bulck and Beullens, 2005).

Some researchers (Neighbors et al., 2008) have utilised complex aspects of the complete Daily Drinking Questionnaire (Collins, Parks and Marlatt, 1985), probing respondents for

the typical number of drinks consumed on each day of a typical week over the past 3 months. The Alcohol Use Disorders Identification Test (AUDIT) scale is also widely used in the alcohol literature (Saunders et al., 1993), but comparatively less frequently in the alcohol marketing literature (see O'Brien and Kypri, 2008 for an example of its use in this field). This instrument is primarily aimed at identifying harmful drinking patterns, and includes 3 questions on consumption frequency and quantity as well as 7 questions focusing on alcohol related harm. The full AUDIT scale was not relevant for this study as the aim was not to identify harmful drinking patterns. A shorter version (AUDIT-C) focusing on the 3 measures of alcohol consumption is sometimes administered on its own (see Haug et al., 2011 for an example within the social norms literature).

While each of the above measures provides very rich data, they impose a heavy burden on respondents, particularly in a context where respondents have to calculate drinking quantities based on standard units. This may not be too difficult for young adolescent respondents who have recently initiated alcohol consumption and for whom drinking is still a novel experience. However, it is likely to be considerably more difficult for university students to give an accurate answer to such questions if drinking alcohol has become a normal low involvement activity for them. This is especially the case if recollections of recent drinking experiences have become clouded as a result of drunkenness. This problem is compounded by the growing popularity of multi-unit alcoholic cocktails that mix several types of spirits and liqueurs. While quantity-based measures offer potentially rich data, especially when combined with measures of frequency over time, they seem inappropriate for this research given the nature of the sample as well as the data collection technique – online surveys necessitate trade-offs in

terms of time and complexity (Galesic, 2006). This problem would have been further compounded by the need to estimate perceived drinking quantities for each of the three different social norms reference groups, and the sheer number of calculations required gave rise to concerns about response validity and respondent fatigue.

If questions relating to drinking initiation are too simplistic and measures of drinking quantity are too burdensome, one is left with measures of drinking frequency. Questions about frequency of consumption or of binge drinking are popular in the literature (Gunter, Hansen and Touri, 2008; Hurtz et al., 2007; Pasch et al., 2007) and even form part of the simplified AUDIT-C scale (Haug et al., 2011) and do not seem particularly burdensome or frustrating for respondents.

It was decided to adopt the approach taken by Neighbors et al. (2006) which is a slightly modified approach to that utilised by Fleming, Thorson and Atkin (2004) and which was partly based on an adaptation of part of the Daily Drinking Questionnaire (Collins, Parks and Marlett, 1985). This involved asking respondents how often they normally drink alcohol on a seven point scale (never; about once a month; 2-3 times a month; once or twice a week; 3-4 days a week; nearly every day; every day). This has the benefit of simplicity and no difficulties were reported during the cognitive interviews. Because the survey was administered during the season of Lent in which it is culturally common in Ireland to make a sacrifice by "giving up" something (such as abstaining from alcohol), respondents were instructed to answer in terms of their typical, non-Lenten drinking.

A second question measured frequency of drinking to get drunk along the same scale. Prior studies have incorporated measures of frequency of drunkenness (e.g. McAlaney and McMahon, 2007). However, definitions of "drunkenness" are subjective (Kerr, Greenfield and Midanik, 2006) and the quantity of alcohol required to become drunk may depend on other factors such as metabolism, ethnicity or gender (Midanik, 2003). It was decided to adapt prior measures of frequency of drunkenness by measuring frequency of drinking to get drunk, using the same seven point frequency scale that was used to measure frequency of drinking.

One of the benefits of asking respondents about drinking to get drunk is that is a somewhat more objective measure of excessive drinking behaviour - it does not depend on metabolic or other factors that might moderate the propensity to get drunk. It is also an intentional behaviour - drunkenness can come about by accident but drinking to get drunk involves some degree of pre-meditation.

This approach seems especially suitable for use with Irish college students given that 34% of Irish adults engage in binge drinking every time they consume alcohol (TNS Opinion and Social, 2007) and that 40% of Irish 15-16 year olds engage in binge drinking at least once per month (Hibell et al., 2012). Pretesting indicated that respondents were familiar with the terminology and that they could answer the question without difficulty. It appears that this is the first study in which a measure of drinking to get drunk has been used.

3.7.4 Social norms

<u>Descriptive norms</u> (Questions 14 and 15)

Measures of descriptive norms are determined by measures of personal consumption – both personal consumption and norms need to be measured in the same way and on the same scale in order to analyse meaningful relationships between the two (McAlaney and McMahon, 2007). For this reason, perceived descriptive norms of frequency of drinking and frequency of drinking to get drunk were measured in the same fashion as personal consumption.

A crucial issue when measuring social norms is the choice of reference groups to use. Over 18 different reference groups have been identified in the literature (Borsari and Carey, 2001). Of fundamental importance in this regard is the issue of norm salience – not all reference groups are of equal importance to individuals (Berkowitz, 2005). Furthermore, the research suggests that both the accuracy (Borsari and Carey, 2003) and influence (Franca et al., 2009) of descriptive norm perceptions are inversely proportional to distance from the reference group.

For the above reasons it was decided to measure the perceived descriptive norms of three different reference groups. The approach used by McAlaney and McMahon (2007) and Delaney, Harmon and Wall (2008) in their respective studies of British and Irish student samples was adapted for use with this sample. Students were asked about the perceived norms of close friends, the average DIT student and of an average individual of the same age in Ireland. It was especially important that a measure of perceived DIT drinking

norms be captured as misperceptions could only be measured for this particular reference group due to the nature of the sample.

The use of three different reference groups is a further reason why measures of personal drinking needed to be relatively simple (see section 3.7.3). Apart from the added unreliability associated with such calculations, having to estimate drinking quantities in standard drinking units for three different reference groups would substantially add to the burden imposed on respondents and perhaps contribute to a higher roll-off rate (Best and Krueger, 2008).

<u>Personal norms and prescriptive norms</u> (Questions 19, 20, 21 and 22)

Personal and prescriptive norms essentially refer to attitudinal or moral judgements about the acceptability of behaviours. Personal norms refer to self-based standards of behaviour that derive from personal values or moral beliefs (Schwartz, 1977). Prescriptive norms can be divided into two different types – injunctive norms which refer to whether certain behaviours are generally socially acceptable (Cialdini et al., 1991) and subjective norms which refer to whether important others think that I personally should engage in the behaviour in question (Fishbein and Ajzen, 1975).

The central decision when designing a question on prescriptive norms relates to the type of behaviour to assess. For instance, Rimal and Real (2005) asked about perceived approval for drinking every weekend. Similarly, Prince and Carey (2010) asked about approval of drinking and approval of getting drunk. Such questions seem to make little sense in the context of Irish student drinking.

Given the particular context of frequent binge drinking amongst Irish young people, it was decided to focus on two types of intentional risky behaviour – drinking to get drunk at the weekend and drinking to get drunk on weekdays. This decision was also informed by the earlier inclusion of descriptive norm measures which examined personal and perceived peer frequency of drinking to get drunk.

Personal norms were assessed by asking respondents what they personally thought about drinking to get drunk at the weekend and on weekdays (2 items). Injunctive norms were measured by asking respondents what they perceived most DIT students and most people their age in Ireland felt about the same two behaviours. These two reference groups mirror those that were used when assessing descriptive norms.

The question about subjective norms was slightly different. While injunctive norms are concerned about the social acceptability of behaviour in general, in order to conform to a theoretically grounded understanding of subjective norms (Fishbein et al., 1993; Flores, Tachann and VanOss Marin, 2002; Rimal, 2008; Tramiflow and Finlay, 1996) it was necessary to refer to the *respondent's own behaviour*.

Many researchers incorporate with the question itself a measure of referents who are important in a *generic* sense, using questions such as "*Most people who are important to me think that I should/should not do XYZ*" (Fishbein, 1993; Francis et al., 2004; Tramiflow and Finlay, 1996). An alternative method of *specifying the important reference groups* was adopted for this research, and *close friends* and *parents* were chosen. This reflects the

approach utilised by other researchers in the field (for example Rimal, 2008 and Rhodes and Ewoldsen, 2009). One of the benefits of measuring subjective norms in this way is that by using close friends it maintains a uniformity of reference groups with the descriptive norms measures. However, it is not safe to automatically assume that close friends and parents are actually important reference groups for all respondents, hence the need to also measure motivation to comply with the wishes of these reference groups (Question 5). The subjective norm score was multiplied by the motivation to comply score to generate a subjective norm value for analytical purposes in line with established practice (Ajzen and Fishbein, 1980; Rhodes and Ewoldsen, 2009).

Similar to prior research, personal, injunctive and subjective norms were all assessed on a 7 point scale ranging from *totally acceptable* to *totally unacceptable* (Francis et al., 2004; Lee et al, 2007; Neighbors et al., 2007b.)

3.7.5   Susceptibility to normative influence (Question 4)

Based on the work of McGuire (1968), the susceptibility to normative influence scale has been developed by Bearden and colleagues (1989) to measure the trait of "influenceability" by others. The motivational underpinnings of the scale are a desire to conform to the norms of reference groups and to feel a sense of belonging and respect (Batra, Homer and Kahle, 2001). The scale has since been used in numerous studies (for example Boush et al., 1994 and Bristol et al., 2005) and has been shown to be related to a variety of behaviours, including shopping behaviour (Mangleburg, Doney and Bristol, 2004) and attitudes towards advertising (Martin, Wenzel and Tomczak, 2008).

Curiously, social norm researchers do not seem to have incorporated a measure of susceptibility to normative influence in prior work. It would seem probable that an individual's propensity to conform to specific perceived normative pressures should be influenced by their general susceptibility to norms, and this general propensity may also be important when considering social norms marketing campaigns to bring about behavioural change.

3.7.6   Peer communication (Question 17)

Communication is an important potential route for norm transmission and formation and it is through conversation that individuals become "carriers" of normative perceptions (Berkowitz, 2005; Lapinski and Rimal, 2005; Perkins, 1997). This is especially relevant in Ireland where embellished tales about drinking exploits are common. Peer communication about drinking is an alternative pathway for the diffusion of norms – individuals may develop normative perceptions through communication with their peers rather than through marketing communications. Further, communication amongst peers has been found to influence drinking behaviour (Lo and Globetti, 1993), and to moderate the impact of descriptive norms on behaviour such that more frequent communication about alcohol leads to an enhanced impact of norms on behaviour (Real and Rimal, 2007).

The measure of communication about drinking has been adapted from Rimal and Real (2003) and Real and Rimal (2007). In the latter paper, Real and Rimal asked respondents about frequency of consumption on a 7 point frequency scale. For the sake of simplicity

for respondents, this was changed to a 5 point scale, quite similar to the approach taken by Moschis and Moore (1979, 1982). The original questions used by Real and Rimal (2007) referred to conversations "about drinking alcohol" and "about your drinking alcohol". In order to ensure that respondents did not misconstrue these questions as referring to serious conversations about alcohol-related problems, the wording was amended to include conversations "about drinking, planning a night out or having a laugh about a night out". Pretesting did not indicate any comprehension problems with this question. However, problems subsequently arose with this question, and it was excluded from future statistical analysis. See section 6.5.4 for a more detailed discussion on this point.

3.7.7 Communication about marketing (Question 18).

If communication about drinking is a carrier of normative perceptions that potentially operates to enhance the influence of descriptive norms on behaviour (Real and Rimal, 2007), then conversations about marketing may operate in the same way by perpetuating the influence of marketing and extending its reach.

The question on communication about alcohol marketing is based on the previous question about frequency of communication about alcohol and uses the same scale. The question was amended slightly during pretesting after some initial feedback indicated a possibility of confusion – some respondents thought that the question might refer to "responsible" drinking social marketing campaigns. Later rounds of pretesting did not indicate any difficulties with the formulation that was finally used.

3.7.8 Living arrangements (Question 1)

Previous work has identified a relationship between living arrangements and alcohol consumption (Joutsenniemi et al., 2007), especially amongst college students (Sun, Maurer and Ho, 2003). Living arrangements that impose relatively few restrictions, for example living with peers as opposed to living with parents (Valiant and Scanlan, 1996), seem to be related to higher consumption levels, perhaps because of the freedom from oversight that such an arrangement confers, or perhaps because of the transmission of norms via student housemates (Ward and Gryczynski, 2009).

Participants were asked which type of accommodation best described their living arrangements based on list of common accommodation types. Pretesting revealed no difficulties with this question.

3.7.9 Physical fitness (Question 2)

Involvement with sports has been shown to be associated with increased alcohol consumption (Collins et al., 2007; Lorente et al., 2004). At first glance, this seems to be counter-intuitive, as alcohol does not enhance sporting prowess. However, such effects may well be because of issues relating to alcohol sponsorship (O'Brien and Kypri, 2008) or because of peer pressure within sports teams. Previous researchers have operationalised fitness as frequency of participation in sports, athletics or exercising (Terry-McElrath and O'Malley, 2011). However, there is evidence that some individuals seem to engage in sports primarily for reasons of sociability (Recours, Souville and Griffet, 2004). It was therefore decided in this research to measure personal importance of physical fitness – if

individuals perceived physical fitness as being important they might be inclined to consume alcohol less frequently.

Personal importance of physical fitness was assessed by asking respondents how important physical fitness was to them on a scale from 1-7. The researcher developed this scale and adapted it following pretests. Originally there was no mid-point on the scale on the basis that, if something is not important then, by definition, it is unimportant. However, based on consistent feedback from survey pretesting a mid-point was added.

3.7.10 Religiosity (Question 3)

Despite the apparent secularisation of the West, religion continues to play an important role in many people's lives, and it has consistently been shown to be related to personal alcohol consumption (Brown et al., 2001; Collins et al., 2007; Fleming, Thorson and Atkin, 2004). There is also some evidence that reactions towards alcohol advertising can be influenced by personal religious commitment (Thomsen and Rekve, 2003).

It is possible to distinguish between religious affiliation and personal religious commitment, often referred to as "religiosity", and many studies have adopted a multi-dimensional measurement of religiosity which include measures of belief and practice (McAndrew and Voas, 2011). Measures of religious affiliation may be unhelpful in the Irish context where religious affiliation is often as much a cultural marker as much as it is a spiritual commitment. According to the most recent Irish census figures, 86% of the population identify themselves as Catholic (Central Statistics Office, 2012), but, depending

on the geographic location, less than one third of this figure attend church weekly (McGarry, 2012). This supposition was confirmed during pretesting.

The measure of religiosity used in this research was taken from the work of Vaughan and colleagues (2011) and asked respondents about the importance of religious beliefs in influencing their decisions in general.

3.7.11 Parental and sibling drinking (Questions 23, 24 and 25)

Family drinking has been shown to be associated with alcohol consumption (Brook et al., 1986; Colder and Chassin, 1999; Ellickson and Hays, 1991). The measures used for parental and sibling drinking were adapted from Gordon and colleagues (2010, 2011) and from Jones and Magee (2011) and asked respondents if they were knew if their mother, father and any of their siblings consumed alcohol. The original versions of these measures included the option "*I don't have/see this parent*". Pretesting suggested changing this to "*not applicable*" to more appropriately cater to sensitive family histories.

3.7.12 Demographic characteristics (Questions 26, 27 and 28)

Age and gender were assessed with standard questions. The question on ethnicity adopted the ethnic categories utilised in the Census of Ireland (Central Statistics Office, 2012).

3.7.13 Discretionary income (Question 29)

The relationship between income and alcohol consumption has long been noted in the literature (Bruun et al., 1975), although more recent work suggests that the relationship may be less significant amongst students who will seemingly cope with lower disposable income by switching to cheaper alcohol products in an attempt to maintain consumption quantities (Delaney, Harmon and White, 2008).

Using measures of total income in consumer studies can be problematic for a variety of reasons (Rossiter, 1995), especially in a student survey. Is money received from parents a form of income? How does one take account of the different financial needs experienced by those who live with parents and those who live away from the family home? For these reasons it was decided to measure discretionary income by asking respondents about how much money they had available to spend on socialising after necessary bills had been paid. This question used an 8 point scale, with discretionary income amounts starting at €20 or less and rising in €20 increments to €140 or more. Early versions of this question proved problematic in pretesting due to a tendency to misinterpret the question as asking about total expenditure on alcohol. Several attempts at creating an understandable question eventually arrived at a sufficiently clear version through successive rounds of pretesting.

3.7.14 Age of drinking onset (Question 30)

Age of drinking onset is strongly related to alcohol consumption and alcohol problems later in life (Atwell, Abraham and Duka, 2011; Hingson, Heeran and Winter, 2006;

Pitkanen, Lyyra and Pulkkinen, 2005). Age of initiation into alcohol consumption was measured by asking respondents how old they were when they had their first full alcoholic drink, excluding sips.

3.7.15 College context variables (Question 31, 32, 33, 34 and 35)

A small number of college context variables were measured in order to identify the sub-population of interest. These included whether respondents were undergraduates or postgraduates, whether they were full time or part time students, and whether they were studying for their finals or not and how many years they had studied in DIT.

3.8   Survey pretesting

The pretesting of survey instruments is universally recognised as an essential step in the research process (Backstrom and Hursch, 1963, de Vaus, 2002; van Teijlingen and Hundley, 2001), and was first mentioned in the research literature over seventy years ago (Katz, 1940). It is especially important when researchers have adopted standardised scales from prior studies - the fact that a particular scale has worked in previous research does not mean that it will be suitable for every group of research participants (Collins, 2003). However, despite the widespread insistence on pretesting in the literature, few studies comprehensively report their pretesting methods (Hunt et al., 1982; Presser et al., 2004). Due to time and financial constraints, corners have tended to be cut (Lehmann, 1979) and, compared to other elements of the research process, little methodological research had been devoted to understanding the pretesting process until relatively recently (Presser et al., 2004).

The survey instrument used in this research was pretested in two stages – firstly with a series of individual cognitive interviews and subsequently with a field pretest followed by a group interview of pretest participants.

3.8.1   Stage 1 Pretesting - Cognitive interviews

<u>Theoretical background and development of cognitive interviews</u>

One important milestone in the development survey pretesting techniques was the

development of cognitive interviewing. For many years the primary form of survey pretesting was a form of interview dry run in which interviewers were debriefed on problems that *they* had encountered (Presser et al., 2004). Originating in the early 1980's (for an historical overview see Jobe and Mingay, 1991; Loftus, 1984) and based on the work of Ericsson and Simon on protocol analysis (1980; 1993), the newer approach of cognitive interviewing was developed.

In brief, the approach may be understood as the administration of survey questions to respondents, and the collection of verbal information from respondents, about the draft survey instrument. The information is then used to further evaluate the draft questionnaire, and to ensure that it actually collects the information that the researcher intends to collect (Beatty and Willis, 2007). The ultimate aim is to pre-empt difficulties of interpretation and processing that might not even become apparent when the survey is in the field (Conrad et al., 1999). This approach differs from earlier, and perhaps less systematic, approaches to survey pretesting in that it seeks to assess how potential *respondents,* as opposed to *interviewers*, comprehend draft survey questions. It is based on the assumption that errors arise in the survey research process because questions cannot be decoded accurately (perhaps due to complexity) or answered accurately (perhaps because they ask for information from the past that is too hard to recall) (Willis, 2006).

Early work using cognitive interviewing was faithful to Ericsson and Simon's protocol analysis technique, and was primarily based around what is known as the "think aloud" approach. The essential aim of the think aloud paradigm is to make the thinking process of respondents "observable" while they decode and process survey questions (Beatty and

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Willis, 2007). In practice, this means that respondents verbally describe their concurrent thinking process in real time. Questions have been raised about the burden that the think aloud method places on respondents, and on the ability of all types of respondents to accurately translate their cognitive processes into verbal reports (Willis, 2005), while other researchers have raised doubts about whether such attempts at verbalisation accurately capture cognitive processes (Nisbett and Wilson (1977).

Over time, the alternative "probing" approach to cognitive interviewing evolved as a pragmatic response to the burden that the think aloud method placed on some respondents (Willis, 1994). The probing approach involves asking respondents questions about how they understood the meaning of the survey instrument and how they accessed the necessary information to answer the questions. It differs from the think aloud process in that the respondent attempts to elucidate internal cognitive processes while simultaneously processing information, whereas with the probing technique the respondent retrieves information about the cognitive processes from the short term memory after the survey has been completed.

The strengths of the think aloud approach lies in its uniformity and in the lack of interviewer interference effects (Bolton and Bronkhorst, 1996). However, Beatty and Willis (2007) argue that the probing technique is less likely to interfere with cognitive processes and is better equipped to identify problems that researchers care about - such as question comprehension and inadequate response options - that might not arise without specific probing. After all, it may not be realistic to suppose that inexperienced respondents can concurrently describe their cognitive processes without interfering with those processes

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(Hak et al., 2008; Redline et al. 1998; Russo et al. 1989). Furthermore, the probing approach places an excessive burden on respondents - it may take some practice to acquire the skill necessary to concurrently verbalise thought processes, whereas the probing technique places the burden on interviewers who, because they have the opportunity to practice the process, may acquire a level of expertise in the use of cognitive interview probes (Willis et al., 1991).

While survey pretesting is obviously desirable, doubts have been expressed about the real world impact of cognitive interviews in generating higher quality data. Some researchers argue that the approach is better equipped to *identify* problems rather than to *solve* them in practically beneficial ways (Forsyth, Rothgeb and Willis, 2004; Schaeffer and Dykema, 2004), although other theorists argue for the effectiveness of the approach in facilitating practical improvements in survey instruments (Campanelli, Rothgeb and Martin, 2005 and Willis, Royston and Bercini, 1987).

Ultimately, problems cannot be solved if they are not first identified and no pretesting approach can automatically provide solutions to problems until after they have been uncovered. For this reason, an iterative approach, whereby incremental changes are made to survey questions after successive rounds of cognitive interviews, is advised (Beatty and Willis, 2007).

Iterative, retrospective probing technique

A decision was made to adopt an iterative, retrospective probing technique to test the questionnaire used in this research. The aim was to ensure that the web survey was as

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user friendly as possible and that respondents could easily understand each question and complete the instrument in a timely manner. The newer approach of probing was chosen over the more traditional think aloud technique primarily because of the relative ease and convenience of the former approach for the student respondents.

More specifically, a retrospective probing technique was employed whereby respondents completed the entire survey prior to probing. This approach is recommended for self-completion questionnaires as it allows participants to complete the questionnaire undisturbed and in a manner that more closely resembles real-world engagement with the research instrument (Redline et al., 1998; Willis, 2006). However, one downside with this approach is that some minutes will have passed between processing and answering a question and interviewer probing about that question. However, Beatty et al. (1997) argue that this is likely to be insignificant so long as the information needed by the researcher is retained in the short term memory. The use of an undisturbed retrospective probing technique allowed for an assessment of both survey completion time and the associated problems of survey fatigue and roll-off, two significant and growing challenges with online data collection methods (Galesic and Bosnjak, 2009). Retrospective probes also allowed for a discussion of the survey layout and interface, as well as possible alternative layouts, in ways that a think aloud approach could not.

The cognitive interviews were iterative in that manifest difficulties in question comprehension and layout were corrected after each interview. Beatty and Willis (2007) and Willis (2006) advocate an iterative approach when probing because it allows corrections and changes to the survey instrument to be tested to confirm that they do in

fact correct the original problem and to ensure that they do not create subsequent difficulties.

3.8.2 Details of cognitive interviews conducted

Five cognitive interviews were conducted in the first round of survey pretesting during November 2011. The interviews lasted between 25 and 45 minutes (excluding the time taken to complete the web survey), and in most cases the discussions naturally ranged beyond the strict parameters of the survey instrument and into the wider terrain of student drinking. In this sense the cognitive interviews also served as mini in-depth unstructured interviews which provided the researcher with valuable contextual and background insights.

Participation in the cognitive interviews required some time and personal commitment on the part of the student participants. It was necessary to ensure that the participants took the process seriously and dedicated sufficient attention to the task. Due to the research sample characteristics – undergraduate DIT students - the researcher had to choose cognitive interview participants either from amongst this group or participants who had characteristics very similar to this group. Because of these specific limitations, the researcher chose a convenience sample of participants with whom he had a working relationship. Three of the participants were then-students of the researcher and two were very recent graduates who had been taught by the researcher. It was felt that the use of recent graduates was justifiable because they were still younger (<25 years) than some of the undergraduates who were ultimately surveyed and because of their helpfulness and

enthusiasm for the process. The three participants who were undergraduate students at the time of the interviews were requested not to participate in the full survey when it was launched, and they were entered into the draw for the incentive prize of an Apple iPad2 just like all other participants.

While some qualitative researchers advise that interviewing individuals known to, or in an unequal power relationship with, the interviewer may limit openness in the interview context (Seidman, 1998), such concerns were not particularly acute in this instance. There are 4 reasons for this:

- The purpose of the cognitive interviews was to assess comprehension of the research instrument rather than to probe personal drinking behaviour, thus the biggest concerns about interviewing individuals known to the researcher – openness, honesty and privacy – were not relevant in this case.

- Some questions were potentially sensitive in nature (for example, the frequency of deliberately drinking to get drunk), thus answers to the survey questions during the cognitive interviews were not recorded, ensuring greater privacy for participants. The interviews themselves did not touch upon individual answers to specific questions unless interviewees made reference to them in order to illustrate a point or unless they took the initiative to orient the conversation away from question comprehension and towards the wider topic of student drinking in general.

- The time commitment required of respondents meant that of necessity the researcher was somewhat constrained in the choice of students who could be approached to participate.

- Participant personality characteristics can be important in a qualitative interview

context (Stewart, Shamdasani and Rook, 2007). Having cognitive interview participants who were willing to open up and capable of engaging with the interviewer outweighed any secondary concerns about interviewing students known to the researcher. It is significant that out of the five cognitive interview participants, the least helpful participant was the one who was least well known to the researcher. This participant did not open up in an unreserved and forthright way like the other participants, and this interview yielded less helpful insights than the others. Interviewer skill can only go so far when faced by unengaged interviewees.

Four of the participants were female and one was male. One (female) participant was a non-drinker and four were drinkers. Attempts were made to recruit extra males for the cognitive interview process but student time and work commitments made it difficult to find appropriate candidates. In any event, most cognitive interview practitioners and theorists agree that cognitive interview samples are generally constructed on a convenience basis without complete demographic representativeness (Beatty and Willis, 2007) and that the main aim is to provide insight into the survey problems encountered by a small number of interviewees (DeMaio et al., 1993).

Participants were provided with an informed consent form which they completed prior to commencing the interview, and they were informed that their responses were confidential and that they could terminate the interview at any time without prejudice. Interviews were recorded for subsequent analysis by the researcher.

3.8.3 Major findings from the cognitive interviews

The most important contributions from the cognitive interviews can be considered under two headings – issues relating to survey layout and structure and issues relating to question wording and content.

<u>Survey layout and structure</u>

The cognitive interviews provided useful insights into the optimal survey layout. These included positioning some of the demographic and personality questions (for instance, living arrangements and the importance of physical fitness) towards the start of the survey in order to ease participants into the process, and to leave some other simple demographic questions (such as age and number of years in college) towards the end to make the process simpler for respondents at a point when their commitment might be inclined to wane. The interviews also informed the decision to place some generic behavioural questions (such as the question about the importance of religion in decision making and the susceptibility to normative influence scale) near the start of the survey as these questions related to behaviours in general rather than alcohol-related behaviours in particular and were less likely to be contaminated by references to alcohol as a result.

The iterative nature of the cognitive interviews was also helpful in deciding important issues relating to survey layout. The series of questions about exposure to alcohol (Questions 9-11) and about personal and perceived consumption frequency (Questions 14-15) could have been presented in either a list or a gird format. Early interviews presented these questions in a list format, and based on early feedback, later interviewees were presented with both formats. There was nearly unanimous agreement that a grid format

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appeared less daunting to respondents and was easier to complete.

The pretesting process also yielded useful feedback in terms of the consent process for respondents. The very earliest versions of the web survey featured three separate introductory pages: (i) information about the research project itself; (ii) information about entering the draw for the incentive and (iii) a consent form for completion by the respondents. The feedback from cognitive interview participants was very clear that this should be reduced to one page to ensure that it was read by respondents and to minimise any frustration that such preliminary formalities might cause.

<u>Question wording and content</u>

The cognitive interviews provided useful insights on question wording and content. Interviews were not solely limited to question content and comprehension, and often touched on issues relating to alcohol marketing and student drinking in general. During the course of these discussions it became apparent that the list of alcohol engagement activities originally presented in Question 6 was incomplete and that specific options relating to newer forms of social media marketing, such as Facebook and Twitter, were required to capture the full scope of ways in which students actively engage with alcohol marketing communications.

The question about discretionary income (Question 29) caused more problems during the cognitive interview process than any other. All cognitive interview respondents misinterpreted this question as asking how much money they actually spent on a night out. After each cognitive interview was completed the researcher worked with the

interviewees to shape a version of that question that was readily understandable to respondents, and it was only at the second stage of pretesting (pilot testing), when the cognitive interviews were completed, that a workable formula was found (see section 3.8.4).

The cognitive interview with the non-drinker was especially important in terms of designing the question about attitudes towards non-drinkers (Question 12). This question uses the Regan Attitude toward Non-Drinkers Scale (Regan and Morrison, 2011; 2013). This scale has previously only been tested and used with drinkers and required some rephrasing for use with non-drinkers in order to make it intelligible and non-offensive for such respondents. This new formulation for some of the scale items also had to strictly maintain the same meaning in order to allow the data generated from drinkers and non-drinkers to be compared. Six of the twelve scale items had to be slightly rephrased from the conditional to the present tense for specific use of the scale with non-drinkers. The changes were as follows:

- *I don't think there would be a problem socially with myself being a non-drinker* changed to *I do not see there being a problem socially, with myself being a non-drinker* (Note: the original scale item is *I would not see there being a problem socially, with myself being a non-drinker*. Cognitive interviews suggested adapting this slightly for the sake of readability to *I don't think there would be a problem socially with myself being a non-drinker*).

- *If I were a non-drinker, I believe my friends would treat me differently* changed to *I don't believe my friends treat me differently as a non-drinker*

- *I would have just as much success with romantic/sexual partners if I were a non-drinker* changed to *As a non-drinker I have just as much success with romantic/sexual partners*

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- *I would find it very hard to enjoy my social life if I were a non-drinker* changed to *I find it very easy to enjoy my social life as a non-drinker*

- *I think being a non-drinker would negatively affect my life* changed to *I think being a non-drinker negatively affects my life*

- *I would hate to be a non-drinker* changed to *I like being a non-drinker*

All of the remaining scale items remained unchanged.

The most provocative scale items for use with non-drinkers were items 12k ("Non-drinkers tends to be repressed") and 12l ("An evening with a non-drinker tends to be predictable"). Such questions could potentially be offensive for non-drinkers and it was not possible to rephrase these items in a less provocative manner while also strictly maintaining the same meaning. The non-drinking interviewee maintained that she did not personally find the question offensive or off-putting, but suggested that an open-ended question (Question 13) be placed below Question 12 in order to allow respondents to make comments about Question 12 if they felt offended by it or wished to defend their particular answers. This suggestion was taken on board, and in the full survey itself only 4 non-drinking respondents filled in this open-ended question in such a way as to imply that they found the question offensive or strange. Other non-drinkers either ignored the open-ended questions or made unrelated observations about Irish drinking culture.

The interviews also yielded important insights into the phrasing of questions on exposure to marketing communications. The earliest versions of Question 9a referred to exposure to "alcohol advertising" (Question 9a). After some interviewees in the early interviews misinterpreted this to also include Government and industry sponsored responsible

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drinking campaigns, the question was rephrased to "TV advertisements for alcohol products". Subsequent rounds of cognitive interviews did not suggest any problems with this new formula of words.

Unanticipated feedback was also received from one interviewee in relation to the questions on family drinking. Questions 23 and 24 ask about parental drinking. The original formulation of these questions had yes/no options and a third option of "I don't have/see my father". One student whose father had committed suicide specified that "Not applicable" would be more appropriate and this was duly changed.

3.8.4 Stage 2 Pretesting – pilot survey and group discussion

Following the completion of the cognitive interviews, a second round of field pretesting was conducted involving a pilot test of the questionnaire with a class of taught postgraduate students. It was deemed appropriate to use postgraduates because (i) they were all under 25 and undergraduates less than 6 months previously and thus were very similar to the final survey sample of undergraduates under 25 years of age and (ii) it was undesirable to dilute the pool of potential respondents to the survey itself by conducting the pilot with a class of undergraduates.

Field pretesting is crucial in discovering potential difficulties with the practical application of the survey in the field (De Vaus, 2002). Field tests play an especially important role with web based surveys in that they can facilitate the completion of the survey in a naturalistic setting, on different computer screen types, with different operating systems and different

web browsers, all of which could negatively impact on survey appearance and usability.

25 postgraduate students in the same class were emailed a link to the survey; 18 completed the questionnaire. Respondents were invited to email the researcher with specific comments or advice about the questionnaire. Only 1 student did so, and this advice was to change the ethnicity categories in Question 28. However, because these categories had been based upon the system used in the Census of Ireland by the Central Statistics Office, the decision was made to leave this question unchanged.

The pilot test revealed one significant flaw with the survey layout at that time. It would have been preferable if the software allowed students to indicate whether they were drinkers or not, and for relevant follow-on questions to appear, tailor-made to participant's response to the prior drinking status question. However, the Bristol Online Survey software on which the questionnaire was based did not allow for follow-on grid questions in this way. This deficiency in the system made the routing of participants through the questionnaire somewhat awkward – non-drinkers had to skip the standard RANDS scale themselves (attitude towards non-drinkers) and proceed to the adapted non-drinker version. Similarly, drinkers, having completed the standard RANDS scale, then had to skip past the adapted non-drinkers version themselves. The field pilot test showed that two of the eighteen participants who had previously answered the standard drinkers RANDS scale then proceeded to start answering the adapted RANDS scale for non-drinkers, even though this question would make no sense for them. The problem was exacerbated by the fact that, once they started the question and realised their error, they could not undo the question or delete their answers. This was a significant issue which

was not uncovered during the cognitive interviews.

Based on this insight from the pilot survey, the decision was taken to create two entirely separate surveys – one for drinkers and one for non-drinkers. Each question in these surveys was relevant for the specific respondents and would not require any questions to be skipped. These two surveys were almost identical apart from different wording on questions relating to personal drinking.

Following the field test, the researcher adopted the novel approach of conducting what might be called an informal focus group or group cognitive interview in the classroom with pilot test participants in the days following their completion of the survey in the field test. This involved going through the survey step by step and inviting feedback on questions from the class.

The major insights from this group discussion included the following:

- The survey link worked for all participants and there were no visual or technical problems accessing or completing the survey on a variety of computer systems, including, in one instance, on a smartphone.
- The self-reported average time for completion of the survey was 10-12 minutes, which was within the ideal time frame.
- Respondents emphasised the importance of ensuring that the direction of Likert-type scales was the same across all questions to facilitate ease of completion and to avoid respondent confusion. Appropriate changes were made to implement this suggestion.

- The earliest versions of the survey included a question about religious affiliation, but two respondents in the pilot test identified themselves as Catholic in one question about religious affiliation and then indicated that they had no religious beliefs in the very next question about religious commitment. This confirmed the researcher's suspicion that religious affiliation in Ireland is often used as a cultural marker that has little bearing in practical life. The question about religious affiliation was subsequently dropped as it was unnecessary.

- Significantly, the pilot test indicated that the ongoing problems with the question on discretionary income had been resolved - there was no confusion around the new formulation of this question (Question 29).

Pilot test participants also provided useful feedback on communicating the survey to the student body in order to maximise response rate, including specific recommendations for social media channels that could be harnessed.

3.9   Data collection processes

Data was collected with the use of the Bristol Online Surveys (BOS) platform. This platform was chosen over others for a combination of practical reasons. The DIT is one of approximately 130 universities that have an institutional licence with BOS, and this licence included free analytical and .CSV exporting facilities. The system is operated by the University of Bristol rather than by a private company, and provides enhanced data security and a name that sounds more authoritative and official than some of the commercial products on the market.

The survey was made available on the 5th of March 2012, and was closed on the 2nd of April 2012. The timing of the survey had to be carefully planned to ensure that it did not clash with other campus-wide surveys and to ensure that it was not affected by student holidays or exams – different Colleges within the DIT can occasionally have derogations from the general academic calendar to facilitate local needs, occasionally resulting in slightly different exam and holiday arrangements across the Institute.

The primary means of informing students about the survey was via an email sent to each student's official DIT email account from the central information service of the DIT. As anticipated, a large number of respondents completed the survey very quickly – 188 students completed it in the first two hours and 840 completed it in the first 24 hours. Thereafter the rate slowed somewhat.

Other initiatives taken to inform students about the survey were messages on the official DIT Facebook page and via the official Twitter account, an email from the DIT Student Union, as well as an email on the Student Union Facebook page and Twitter account. An announcement was also placed on the DIT Campus Life webpage – this is a resource site about student life in DIT. A final reminder email from the central DIT information service was distributed in late March prior to the closing of the survey. Each form of communication saw a spike in responses for approximately 24 hours, with spikes becoming successively smaller in size.

As previously discussed, one particular challenge with the use of the BOS system was that it did not allow for routing through the questionnaire for certain types of question formats. This was particularly problematic due to the fact that two versions of the Regan Attitudes Towards non-Drinkers scale were needed – one for drinkers and the other for non-drinkers.

It was decided to address the structural challenges with the RANDS question by using two different questionnaires – one in which all questions were designed for drinkers and the other of which was designed for non-drinkers. In order to ensure that the announcement email inviting students to complete the survey was succinct and without confusion, only one web link was provided. This link lead to a page which provided information mandated by the DIT Research Ethics Committee. Respondents were then told that there was a different version of the survey for drinkers and non-drinkers, and they were provided a link for each version of the survey.

One of the strategies used to encourage a higher response rate was to enter respondents into a draw for an Apple iPad. Pretesting indicated that an iPad was an attractive prize for students. Recent evidence also indicates that a large raffled prize is the best type of incentive for maximising completion rates and also offers the lowest cost per completed survey (Gajic, Cameron and Hurley, 2012). The iPad prize was mentioned prominently in each communication with students, including in the subject line of emails.

Offering a raffled incentive necessitates the collection of personally identifying information. But as previously outlined, the DIT Research Ethics Committee insisted that personally identifying information not be collected within the survey itself. This restriction created two further challenges to the integrity of the research process – firstly to ensure that each respondent completed the survey only once and secondly to ensure that only DIT students completed it (Best and Krueger, 2008).

These challenges were overcome by placing a 23 character alpha-numeric code on the last page of the survey and asking students to email this to a dedicated email address. The BOS system was incapable of generating a unique code for each participant, so the same code was used in each survey. However, the description of the code was deliberately ambiguous in order to create the impression that it was unique to the individual survey (though still guaranteeing anonymity). Respondents were requested to email the code from their official DIT email address only. An examination of the emails sent to the designated email account revealed no evidence of outsiders completing the survey or of students completing it more than once. Also, on the very first page which provided information on the survey, respondents were informed that a DIT student card had to be

produced before receiving the iPad. Given that the major incentive to complete the survey was to win the iPad, and that failure to follow the instructions would preclude entry into the draw, these measures were the best available approach to ensure that only DIT students entered the draw, and that each individual did so only once.

Chapter 4: Data overview, preparation and analytical approach

4.1   Introduction

The presentation and discussion of data analysis and results is divided over two separate chapters and one Appendix. This chapter provides an overview of the data, as well as the steps that were taken to screen the data and prepare it for analysis. The following chapter examines Research Propositions 1 to 3 – the role of alcohol marketing communications in influencing alcohol consumption as well as the indirect effect of marketing on drinking frequency via normative perceptions. In examining these three Research Propositions, it is hoped to extend the debate by addressing the issues of *how* and *when* alcohol marketing influences consumption and also to address the argument proposed by the alcohol industry that marketing is unimportant because of the role of peers in shaping alcohol related behaviours. Finally, Appendix III discusses Research Propositions 4 to 8 which examine the prevalence of normative *mis*perceptions, negative attitudes towards non-drinkers and the indirect effect of marketing via normative overestimations. In analysing these five Research Propositions it is hoped to build on and extend the core norms-mediation model proposed in the first three Research Propositions.

4.2 Data overview

Data was gathered between March 2012 and early April 2012. A total of 2,271 students attempted to complete the online survey, and 1,737 students fully completed it (76.4% completion rate). It is impossible to know why almost one quarter of those who commenced the survey did not persevere to completion. While it may be a result of survey fatigue and roll-off (Galesic and Bosnjak, 2009), there are two alternative explanations. In the first instance, some students may have clicked on the links and looked at the first pages of the survey out of mere curiosity, and perhaps never intended to complete it. Alternatively, some students may have started the survey and decided to return to it later when they had more time to complete it. The Bristol Online Survey software does not allow respondents to save incomplete surveys, meaning that respondents would have had to complete the survey again from scratch. If this was the case then their earlier attempts would have been recorded as an incomplete response, meaning that the real completion rate would be higher than 76.4%. Incomplete survey responses were not included in the analysis, and the first wave of analysis and data screening was conducted on the 1,737 completed responses.

4.3   Data screening

The data was screened for responses that were deemed to be unusual or contradictory. Such unreliability could creep into online survey responses either through genuine mistakes or through carelessness on the part of respondents who merely completed the survey in a thoughtless manner in order to enter the draw for the incentive prize – ultimately no data collection method is completely immune to respondent carelessness of that sort. A careful comparison of answers to different questions allowed for relatively easy identification of problematic responses.

A total of 153 respondents were excluded from the analysis because of unreliable and contradictory responses. These respondents fell into two broad categories.

Firstly, responses were deemed to be unreliable if the answers given to the two major questions about marketing were inconsistent. For example, if a respondent in Question 6 (engagement with marketing) reported that they had never received a promotional email featuring alcohol brands, but in Question 10 had indicated that they had received such an email within the past week, their answer was deemed to be inconsistent and logically impossible. An analysis of the questionnaire revealed 5 question pairs of this nature where conflicting answers were potentially possible. Using a crosstab analysis, cases with potentially conflicting answers were identified and individually scrutinised. A total of 53 respondents provided answers to these questions that were inconsistent and logically impossible. In several instances these respondents provided logically inconsistent responses to more than one question, a good indication that other aspects of the survey

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may also have been compromised through careless or vexatious responses. These respondents were removed from the dataset and excluded from further analysis.

The second category of logically inconsistent responses related to Question 14 (frequency of drinking) and Question 15 (frequency of drinking to get drunk). These two questions asked about the frequency of both types of drinking behaviour across 4 different groups – the respondent themselves, close friends, the average DIT student and the average person of the same age in Ireland. An obvious conflict exists if a respondent reported that frequency of drinking to get drunk was greater than frequency of drinking within one of these categories, and providing such an inconsistent answer raises concerns over the reliability of responses generally. A total of 100 respondents gave logically impossible answers to at least one of these question pairs, and often respondents provided logically impossible answers to more than one pair of questions. These 100 respondents were removed from the dataset and excluded from further analysis on the basis that their responses cast doubt over the reliability of their other responses.

A comparison between the marketing questions and the alcohol consumption questions revealed a number of individuals who provided logically impossible answers to both sets of questions. Upon closer examination of all answers, other strange anomalies were noticed amongst the 153 who were removed from the data set, including some who always picked the first response on Likert-type scales, possibly indicating a general carelessness of approach and further confirming that their removal from the dataset was the appropriate course of action.

Removing potentially unreliable respondents from the dataset left a sample of 1,584 respondents. Of this sample, 15.2% were postgraduates (N=240); 13.7% were part time students (N=217) and 23.4% were aged 26 or more (N=371). These respondents were removed from the database to allow for substantive analysis of the more homogenous group of full time undergraduates aged 25 and younger. Postgraduates, part-time students and mature students were included in the original sample for the sake of convenience – recruitment emails were simpler and shorter if the survey was open to all students. There was considerable overlap between these three categories, leaving a sample of 1,071 full time undergraduates aged under 25 for the main analysis.

25 was chosen as a cut off age because it restricts the analysis to a more homogenous group of undergraduates who are likely to have more in common and because 25 is a significant age in terms of alcohol policy. In Ireland alcohol advertisements may not feature actors who are, or who appear to be, under 25 (Advertising Standards Authority for Ireland, 2007) and in in other countries (for example, Scotland) a "Challenge 25" policy has been introduced whereby those who appear to be under 25 years of age are challenged to produce proof that they are over the legal drinking age before they can buy alcohol (Cummins, 2011). This policy has been voluntarily adopted by some Irish retailers (Aldi, 2013).

4.4   Response rate

2,271 students responded to one of the various survey announcements by at least starting the questionnaire. This represents an approximate response rate of 12.4%. 1,737 students fully completed the survey. The 1,071 full time undergraduates under-26 selected for analysis represent approximately 9.5% of the equivalent DIT student population.

Maximising survey responses was hampered by the fact that the researcher did not have access to the student email database and had to rely on the DIT central information system to distribute emails about the survey. This meant that only 2 emails could be sent to encourage survey participation, and that the timing of the emails was not within the control of the researcher but depended on when other DIT staff could get around to sending the email. There is evidence that response rates to emailed survey invitations can vary according to the day of the week or time on which they are sent (Epps, Hall and Hunter, 2010). A further complication was that the central DIT information service would agree to sending only one reminder email and this wasn't sent until the last week of term prior to the Easter holidays. It is possible that response rates could have been greater if the researcher had more control over the timing and frequency of reminder emails.

Decreased response rates are a growing phenomenon with online surveys. As discussed in section 3.6.3, online surveys are a victim of their own success – as more people utilise them because of their effectiveness, speed and low cost, there has been a corresponding decline in response rates. This is especially acute amongst college students. Many undergraduate DIT programmes require students to complete research dissertations, and

student samples are often accessed as samples of convenience for this research, the net result of which is dampened response rates across the board. A number of weeks after this survey was closed there were so many requests from other researchers for access to student samples that, at the request of students themselves, DIT instituted new policies to limit the number of requests sent to students to participate in surveys.

A fully accurate assessment of the response rate is complicated by the fact that, unlike a decade ago, many students have private email accounts long before arriving in college and no longer rely on their college to provide email access to them. The net result of this is that apparently very many students rarely, or never, access their college email accounts. This phenomenon is not limited to the DIT. An online student survey conducted over 5 years earlier in the neighbouring University College Dublin (UCD) recorded a response rate below 20%, despite having significant funding from the alcohol industry and offering incentives worth twenty times the incentive available for participants in this study. The researchers involved reported that approximately half of the student population in UCD never access their official university email account (Delaney, Harmon and Wall, 2008). The equivalent figures for college email access within the DIT are not available, but it seems probable that technological advancements have been such that the official college email address now plays an even less important role in the communication habits of many students in DIT.

In any event, it is reassuring that on certain key dimensions, the sample is similar to the general DIT population. For example, the percentage of postgraduates in the full sample of those who completed the survey (15.2%) is broadly similar to their percentage amongst

the full student body (17%), and the proportion of students from each major DIT campus was broadly similar to that of the DIT student population as a whole.

4.5   Overview of the respondent characteristics

Gender

Of the final sample of 1,071 full time undergraduates under 25, 48% were male and 52% were female. While this is very similar to the total full time undergraduate student population in Ireland as a whole (50.3% female), it differs from the DIT full time undergraduate student population of which 59% are male (Higher Education Authority, 2013).

It is not immediately clear why disproportionately fewer males completed the survey than females. There is some evidence that females are more likely to respond to online questionnaires than males so similar effects may be at work here (Boulianne, 2013; Smith, 2008). It may also be the case that those who commenced the survey but failed to complete it were disproportionately male – there is no way of discerning this. It may be the case that males are disproportionately more likely to ignore their college email accounts and thus were unaware of the survey in the first instance.

The representativeness of the sample is most important in this study when it comes to calculating perceptions of the DIT norm for alcohol consumption as the calculation of the norm requires a generalisation from the sample to the campus population as a whole. If males and females perceived DIT norms differently, and if their median drinking levels were different, then the over-representation of females in the sample could have consequences in terms of calculating the prevalence of normative misperceptions. Prior research indicates that normative misperceptions are most appropriately calculated by

using median scores for each of the behavioural and attitudinal scales (Perkins et al., 2010). As Table 1 illustrates, there is only one difference between the median scores of male and female students across all of 8 different measures of personal behaviour and perceived norms. This sole discrepancy arises in relation to personal frequency of drinking, and suggests that the median frequency of female DIT student drinking is two or three times per month whereas the median frequency of male student drinking is two to three times per week. Reassuringly, the overall median level of drinking frequency for the entire sample (which is the measure on which the calculation of the actual campus norm is based) is the same as the median level for male student drinking. Just like the other measures, the overall DIT median level of drinking for this sample has not been skewed by the disproportionate number of female respondents.

In summary, even though the gender split of the sample is proportional to that of the student population across Ireland as a whole, females are over-represented in this sample as a proportion of DIT students. An analysis of the data reveals that, in the area where representativeness of the sample is most important, the over-representation of female students in the sample is of no statistical consequence.

Age

The average age of respondents was 20.57 years (SD 1.814). A complete breakdown of ages is given in Figure 1.

Age of first drink

Figure 2 outlines the age at which respondents first consumed alcohol. 2% first drank alcohol prior to 11 years of age; over 50% had consumed alcohol by the age of 15.

Ethnicity

Table 2 outlines the ethnic background of the sample. 88.9% of the respondents were of Irish ethnicity, slightly higher than in the population as a whole, which is 84.4% Irish (Central Statistics Office, 2012).

Discretionary income

Table 3 outlines levels of discretionary income. 55% of the respondents have less than €40 per week available for socialising after paying essential bills.

Religiosity

Figure 3 outlines levels of religiosity in the sample. Religiosity is defined as the extent to which religious beliefs influence daily decisions. 16.7% either agree or strongly agree that religious beliefs influence their decisions. The remaining 83.3% who claim that their religious beliefs do not influence their decisions includes 30.1% who have no religious beliefs.

Marketing

The median number of exposures to alcohol marketing communications within the past week was 8, and the average respondent had engaged with 7 different types of alcohol marketing communications, and 4 different types of *online* alcohol marketing communications. More details are provided in Figures 4 – 6.

4.6   Data manipulation

A number of variables were manipulated for the purposes of analysis and model building.

Living arrangements

Participants were originally asked which type of accommodation best described their living arrangements based on a list of common accommodation types. The aim of this question was to differentiate between students who lived in accommodation that conferred relative personal freedom from those whose living arrangements implied potentially less freedom or more oversight. This variable was dichotomised - those who lived alone, with other students or with a spouse/partner were classified as having relatively free living arrangements, while those who lived with parents/guardians, with children, in "digs", or in a formal residence run by a charity or religious institution were classified as having relatively less freedom. Those who specified another, unlisted form of accommodation were classified based on the judgement of the researcher.

Religiosity

The purpose of the religiosity question was to distinguish between those whose religious beliefs influenced their decisions and those for whom religion was not a factor in daily decision making. Due to the small number who strongly agreed that religion influenced their decisions (2%) it was decided to simplify this variable by dichotomising it. Those who agreed or strongly agreed that religion influenced their daily decisions (16.7%) were combined, and those who disagreed, strongly disagreed or had no religious beliefs were combined.

<u>Susceptibility to normative influence</u>

The susceptibility to normative influence scale was based on the work of Bearden, Netemeyer and Teel (1989), who refined a 12-item scale based on two underlying factors – a normative factor comprised of 8 items and an informational factor based on 4 items. Many researchers have used only a subscale of the overall 12 item scale (Boush, Friestad and Rose, 1994; Bristol and Mangelburg, 2005). In the present research, while all 12 items were administered to respondents, it was decided to use only the 8 item normative subscale for analysis. There were two reasons for this. Firstly, the 8 item normative scale had a marginally higher Cronbach's α value (0.89) than the 12 item scale (0.85). But more importantly, the first 8 items are more appropriate for low involvement product choices such as alcohol consumption, whereas the final 4 informational items are more appropriate for high involvement purchase decisions that involve more deliberate and infrequent expenditures (Wooten and Reed, 2004).

<u>Engagement with alcohol marketing</u>

Total engagement with alcohol marketing was computed by counting the number of ways in which each respondent engaged with alcohol marketing. This created a scale ranging from 0-17.

<u>Engagement with online alcohol marketing</u>

12 of the 17 different types of engagement with alcohol marketing are online forms of marketing communications. Each respondent's score for engagement with online alcohol marketing was calculated by counting these responses, creating a scale ranging from 0-12.

Exposure to marketing within the past week

Exposure to marketing within the past week was calculated by counting the number of different types of alcohol marketing exposures each respondent was exposed to within the past week, creating a scale ranging from 0-15.

Attitudes towards non-drinkers

Attitudes towards non-drinkers were assessed using the Regan Attitudes towards Non-Drinkers Scale (Regan and Morrison, 2011; 2013). All items apart from the first scale item which measured social problems in the event of abstaining from drinking alcohol, and the third item which measured the perceived impact of drinking alcohol on romantic and sexual success, were reverse scored. Due to a problem with the survey software there was a very small number of missing items on this scale (<1% of the total number of scale responses). Little's MCAR test (Little, 1988) revealed no statistically significant deviation from randomness in the missing data, χ^2 = 153.95, df = 133, p = .103. This allowed for the use of the expectation-maximisation algorithm to impute missing data in a manner that was not adversely biased (McArdle, 1994; Schafer and Olsen, 1998).

Personal frequency of drinking and personal frequency of drinking to get drunk

Both of the main drinking outcome variables were measured on a seven point frequency scale. However, in both cases, the distribution across the categories was very uneven, with several categories at the extremes of the scale having very few – and in two instances, no – respondents. In the case of both variables, the distribution of cases across the categories meant that it was absolutely necessary to reduce the number of categories from seven to

four, a reduction which rendered the use of multiple regression inadvisable due to the likelihood of difficulties meeting the assumption of linear relationships given the reduced number of categories or scale points in the outcome variable (Berry, 1993). It was therefore decided to dichotomise both variables measuring personal alcohol consumption behaviour in a practically meaningful manner which would then be relevant from a policy perspective. Two categories were created for each variable – drinking (or drinking to get drunk) less than once per week, and drinking (or drinking to get drunk) once per week or more. Drinking once per week suggests an ongoing habitual relationship with alcohol (albeit not necessarily unhealthy) while drinking to get drunk on a weekly basis represents an intentionally risky and unhealthy relationship with alcohol. While dichotomising the variables in this fashion leads to some loss of information, the natural distribution of the raw data would in any event have forced a reduction from seven to four categories, and it was felt that the greater ease of analysis, and especially the greater ease of interpretation from a practical and policy perspective, made this trade-off worthwhile.

This binary split on both variables lead to a 48.1%/51.9% split for frequency of drinking (it also happened to be a median split) and a 73.4%/26.6% split for drinking to get drunk. The use of binary data in this way necessitated conducting much of the subsequent analysis with binary logistic regression.

Subjective norms

Following the precedent of other researchers (Ajzen and Fishbein, 1980; Rhodes and Ewoldsen, 2009), the raw perceived subjective norm scores for close friends and parents

were multiplied by the motivation to comply with the wishes of close friends or parents, respectively. This subjective norm variable for weekend and weekday drunkenness was then combined for both reference groups to create an overall score for subjective norms for close friends and for parents.

Communication about marketing

This variables was reverse scored, such that a higher score implied a greater frequency of communication.

Personal approval for drinking to get drunk on weekends and weekdays

As with the injunctive norm variables, personal norms around approval of drinking to get drunk on weekends and weekdays were reverse scored, such that a higher score implied more permissive personal norms.

Familial drinking

The variables relating to maternal, paternal and sibling drinking were each dichotomised; categorisation depended on whether the relevant family member drank or not. Those who were unaware of whether the relevant family member drank or not, or who did not have family members, were combined with those who did not drink.

Ethnicity

The data for ethnicity produced very unequal categories. While 88.9% of respondents were Irish, only 0.2% were travellers, 0.6% were Chinese and 1% were African, with the

remaining 9% composed of a mix of other ethnicities. The data was therefore dichotomised into an ethnic Irish group and a non-Irish group.

Discretionary income

The original question on weekly discretionary income included 8 categories, ranging from *€20 or less* to *more than €140*. The data revealed that *more than €80* was a better cut off point at the upper end of the scale – only 13.6% of respondents had in excess of €80 discretionary income per week. The data was recoded appropriately.

Age of first drink

The data for age of drinking initiation was recoded slightly – those who had never had a drink, and those whose first experience of drinking alcohol was when they were over 18, were combined to form a category labelled *did not drink underage*.

Descriptive and injunctive norms

Descriptive norm data was collected for three reference groups (close friends, the average DIT student and the average person of the same age in Ireland) and for two behaviours (frequency of drinking and frequency of drinking to get drunk). Injunctive norms were assessed by measuring the perceived acceptability of drinking to get drunk (i) at the weekend and (ii) on weekdays for both the average DIT student and the average person of the same age in Ireland. Having 6 different descriptive norm variables, and 4 different injunctive norm variables, was undesirable, and a simpler range of variables was felt to be more appropriate in order to aid analysis and reporting.

Some researchers have previously attempted to combine descriptive and/or injunctive norm variables. For example, Prince and Carey (2010) combined a number of norm variables for college students and for close friends into two variables – one for close friends and one for college students. Rimal (2008) combined 4 descriptive norm variables measuring perceived alcohol consumption amongst college students in different contexts into one overall descriptive norm variable. Davey-Rothwell, Latkin and Tobin (2010) adopted a similar approach by combining a number of drug-related behaviours for drug partners into one composite descriptive norm variable. Maddock and Glanz (2005) took a slightly different, and unusual, approach by combining a number of descriptive and injunctive norms into one measure. Lee et al. (2007) combined 4 different measures of perceived injunctive norms for the same reference group into one variable; an almost identical approach was taken by Neighbors et al. (2007b).

Significantly, each of the above approaches maintained a distinct social norm measure for each reference group in the study. However, given the focus of this study on the use of social norms as an indirect pathway for the influence of marketing communications, a single global measure of descriptive norms and a single global measure of injunctive norms was desirable. However, the fundamental problem with simply combining social norms measures from different reference groups is the issue of salience (Berkowitz, 2005; Linkenbach, Perkins and DeJong, 2003) – different reference groups have different levels of importance, with proximal reference groups tending to exert a greater influence on behaviour than distal groups (Thombs, Wolcott and Farkash, 1997). Simply combining or averaging measures of perceived norms runs the risk of overestimating the power of some groups and underestimating the power of others.

It was therefore decided to combine the descriptive norm variables by developing a weighted norms index. This decision was based, in part, on personal correspondence with experts in the social norms field (Berkowitz, 2013; Neighbors, 2013). The index was created by conducting a series of simple bivariate correlations between each type of perceived norm and the corresponding dependent variable in question. Thus, perceived descriptive norms for (i) the frequency of drinking of close friends, (ii) the average DIT student and (iii) the average person of the same age in Ireland were each correlated with the dichotomised variable measuring personal frequency of drinking. Similar correlations were conducted for the perceived descriptive norms for the frequency of drinking to get drunk with personal frequency of drinking to get drunk. Due to the nature of the data, Spearman correlations were conducted for all descriptive norm relationships, and all correlations were statistically significant (Spearman, 1910; Field, 2005).

Injunctive norms were only assessed for drinking to get drunk. The variables measuring perceived acceptability of the average DIT student towards drinking to get drunk on the weekend, and on weekdays, were averaged. The same procedure was applied to the variables measuring the perceived approval of the average person of the same age for both types of behaviours. Each of these combined injunctive norm measures was correlated with personal frequency of drinking to get drunk. Due to the nature of the data – a continuous variable correlated with a non-naturally occurring dichotomy with an underlying continuous structure – biserial correlations were conducted (Field, 2005). All of the correlations were statistically significant.

The correlation coefficients for all of the above correlations are shown in Table 4.

The correlation coefficients for each reference group were then averaged. The most distal reference group – the average person of the same age in Ireland – was chosen as a base, and given the value of 1. The average DIT student, and close friends, were each weighted relative to the base. The final weights of each reference group was as follows:

- Close friends: 2.9

- The average DIT student: 1.35

- The average person of the same age in Ireland: 1.

These weights are indicative of the heightened salience of the close friends reference group and of its importance relative to all other groups.

Universal descriptive and injunctive norm variables were then created by summing the products of each individual norm variable and its respective weighting.

For descriptive norms, this means:

([perceived frequency of drinking of close friends + perceived frequency of drinking to get drunk of close friends] x 2.9) + ([perceived frequency of drinking of the average DIT student + perceived frequency of drinking to get drunk of the average DIT student] x 1.35) + ([perceived frequency of drinking of the average person of the same age in Ireland + perceived frequency of drinking to get drunk of the average person of the same age in Ireland] x 1)

For injunctive norms, this means:

([perceived approval of the average DIT student towards drinking to get drunk at the weekend + perceived approval of the average DIT student towards drinking to get drunk on weekdays] x 1.35) + ([perceived approval of the average person of the same age towards drinking to get drunk at the weekend + perceived approval of the average person of the same age towards drinking to get drunk on weekdays] x 1)

The above approach created universal descriptive and injunctive norm measures which combined different reference groups and different behaviours/attitudes, *but which also incorporated a measure of salience and social distance*. It is believed that this is the first time that such an approach has been taken with social norms data.

When testing the assumption of a linear relationship with the logit of the outcome variable in logistic regression (Field, 2005), no difficulties were uncovered with the newly created universal injunctive norms variable, and this was the sole injunctive norm variable used in all regression models.

Unfortunately, the same could not be said for the new universal descriptive norm variable – it did not meet the assumption of a linear relationship with the logit of the outcome variable (Field, 2005). Categorising the new variable into quartiles or quintiles also presented problems with the linearity assumption, and it was decided against attempting a transformation of the data given the added complexity of reporting and interpretation associated with such transformations. Therefore, it was decided to retain the original descriptive norm variables – one for each of the three reference groups (close friends, the average DIT student and the average person of the same age).

It was also necessary to dichotomise these variables. The distribution of the data across the seven point frequency scales on which perceived descriptive norms was measured was also problematic in that several categories contained few or even no respondents, necessitating a natural reduction in categories, very similar to that required for personal drinking behaviour (discussed above). Given that the descriptive norm variables were to be analysed primarily as mediating variables, for ease of analysis and interpretation, and for the sake of consistency, it was decided to dichotomise them in the same way that personal drinking was dichotomised. Thus, six new variables were created – measures of whether close friends, the average DIT student and the average person of the same age (i) drank, or (ii) drank to get drunk, less than once per week or at least once per week. As outlined in section 5.4.1, mediation analysis was only conducted with the close friends variable due to the overwhelming importance of this measure of descriptive norms in the logistic regression analyses. The binary split for close friends drinking was 17% (less than once per week) and 83% (once per week or more) and for drinking to get drunk was 48% (less than once per week) and 52% (once per week or more).

While the attempt to combine the descriptive norm variables in a weighted index that accounted for salience and social distance was unfortunately unsuccessful in this study, this was due to the distribution of the data rather than to the logic underlying the weighted index itself. Indeed, the approach was appropriate and successful for the creation of the universal injunctive norm variable. The use of salience and social distance weights in the creation of social norm measures is recommended for future researchers

who are confronted with data from different reference groups but who desire a single comprehensive measure of descriptive or injunctive norms.

4.7   Assumptions underlying regression analysis

A number of assumptions need to be met before regression analysis is conducted. These assumptions vary with the type of analysis conducted. Both multiple regression and binary logistic regression were used in this thesis. The assumptions that underpin both of these approaches are outlined below.

4.7.1   Testing the assumptions of multiple regression

While most of the analysis was conducted with logistic regression models, a number of hypotheses were tested with multiple regression analysis. All models were assessed to ensure that they satisfied the relevant assumptions underpinning multiple regression:

- Multicollinearity was assessed by examining the correlation matrix of all predictor variables. No problems were detected in any of the models. A more accurate approach is to use the variance inflation factor statistic and the tolerance statistic. Recommendations differ with respect to the appropriate cut off points for these statistics, with some authors recommending a maximum VIF as high as 10 (Neter, Wasserman and Kutner, 1989) and others as low as 4 (Pan and Jackson, 2008). Similarly, there are diverse views on the appropriate cut-off level for the tolerance statistic, although a minimum recommended value of 0.1 is commonly recommended (Tabachnick and Fidell, 2001). The variance inflation factor and tolerance statistics were well within acceptable limits for all models.

- The linearity of predictor variables with the outcome variable was assessed with partial plots for all continuous predictor variables (Field, 2005). All plots for all

variables in all models were consistent with the existence of linear relationships, and confirmed the treatment of disposable income, age of first drink and communication about marketing as continuous variables in the analysis, even though, under a very strict interpretation, they were not truly continuous. The linearity tests also confirmed the appropriateness of the newly created universal injunctive norm variable.

- Influential cases were examined using Cook's distance. All values of Cook's distance in all models were well under the recommended limit of 1 (Cook and Weisberg, 1982).

- Independence of errors was checked with the Durbin-Watson test statistic. All values were very close to 2, indicating that residuals were uncorrelated (Durbin and Watson, 1951; Field, 2005).

- Plots of standardised predicted and residual values were used to detect evidence of heteroscedasticity (Miles and Shevlin, 2001). All plots suggested that the assumption of homoscedasticity had been met in all models.

- The normality of residuals was assessed by means of a histogram of residuals as well as normal probability plots (Field, 2005). All graphs indicated that residuals were normally distributed in all models.

4.7.2 Testing the assumptions of logistic regression

While there are fewer assumptions that must be met with respect to logistic regression because it is a non-parametric method, there are still important issues that need to be checked.

- Each regression model was checked to ensure that it was an appropriate fit for the data by using the Hosmer and Lemeshow test statistic (Hosmer and Lemeshow, 1989).

- Influential cases were examined with Cook's statistic. All Cook's values in all models were under the recommended limit of 1 (Cook and Weisberg, 1982).

- All variables were checked for multicollinearity by examining correlation matrices and by checking the tolerance and variance inflation factor statistics. This analysis was conducted in multiple regression analysis as the relevant tests are not performed by the IBM SPSS logistic regression analysis package.

- Each categorical variable was placed into a crosstab analysis with the relevant dependent variable to ensure that there were sufficient cases in each category (Field, 2005).

- For continuous independent variables, the "linear in the logit" assumption that the natural log of the odds of the dependent variable is a linear function of the continuous independent variable was evaluated using fractional polynomials with the "fracpoly" command in the Stata statistical software package. This compares the deviance of a linear model to models of various powers (-2, -1, -0.5, 0.5, 1, 2 and 3) and degrees (Royston and Altman, 1994; Vach, 2013). In the very strictest sense, disposable income, age of first drink and frequency of communication about marketing were not natural continuous variables. However, the fractional polynomial test supported treating them as continuous variables in the logistic regression models. Similarly, the test confirmed the appropriateness of treating the other continuous variables as continuous variables in the models, including the newly created universal injunctive norm variable. As discussed in section 4.6, the fractional polynomial test did not support the use of the newly created universal descriptive norm variable as a continuous variable, forcing the weighted descriptive norm index to be abandoned in favour of the original, individual variables.

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4.8 Mediation analysis: background and analytical technique

4.8.1 Introduction to mediation analysis

Mediation analysis is a popular technique in the social sciences. Early studies in mediation were published in the 1930's (e.g. Wright, 1934). But as with many areas in quantitative analysis, the easy availability of sophisticated computer software has facilitated the growth of mediation analysis over time. The seminal work of Baron and Kenny (1986) has, according to Google scholar, been cited in the literature almost 40,000 times, and approximately one quarter of papers published in the Journal of Consumer Psychology and the Journal of Consumer Research (to take just one small domain in the field of social sciences) involve some form of mediation analysis (Iacobucci, Saldanha and Deng, 2007).

Analytical models that examine direct effects establish whether there is a relationship between two variables. Mediation takes this analysis a step further by attempting to address *how* two variables are related by examining the role of an intervening variable. As such, mediation analysis is essentially causal in nature and proposes an explanatory path for the influence of one variable upon another.

One controversy within the field is the use of mediation analysis in correlational, or cross-sectional, studies given the essentially causal nature of mediation analysis. The "gold standard" of causal studies is the experimental design, and there are those who argue that mediation analysis should only be used in such a context and never with cross-sectional research designs (Cole and Maxwell, 2003). However, as discussed in section 1.4, ethical

concerns preclude the use of experimental designs in most areas of alcohol-related research, and as outlined in section 3.4, ethical and practical considerations precluded the use of a longitudinal research design in the present study. Restricting mediation analysis to experimental research only would place an artificial limit on scientific inquiry (Kenny, 2008). Indeed, as Iacobucci (2008) points out, the majority of mediation analyses, even in the top journals, are correlational in nature. Rather than abandoning all mediation analysis unless one has ideal "laboratory conditions" for mediation research, Iacobucci (2008) suggests that researchers must (i) justify the hypothesised mediation relationship on theoretical and conceptual grounds and (ii) not yield to the natural temptation to automatically over-interpret the findings in a causal fashion.

4.8.2   Approaches to mediation analysis

Baron and Kenny (1986) propose 3 regression models when testing mediation and their approach has been the basis of many subsequent analytical approaches:

<u>Model 1:</u> Show that the initial predictor variable is associated with the main outcome variable.

It is worth noting that some theorists argue that this initial step is not, in fact, strictly necessary if complete mediation is expected – see Kenny (2013) for a discussion of this scenario. Furthermore, there are some more common scenarios in which an indirect effect could exist in the absence of a significant relationship between the main predictor and outcome variables. These include scenarios where there are complex relationships which work in opposite directions and cancel each other out, negating any significant main effects relationship, even though a significant indirect effect may still exist. See Hayes

(2009) for a more complete discussion on this point. In summary, while there is a certain logic in the first step proposed by Baron and Kenny (1986), and while reporting it can be helpful in terms of clarity, it is no longer advisable to terminate the search for a mediating relationship if no significant main effects relationship has been found.

Model 2: Show that the main predictor is associated with the mediating variable.

This essentially involves running a regression analysis with the mediating variable as a dependent variable.

Model 3: Show that the mediating variable is a significant predictor of the main outcome variable, while controlling for the main predictor variable of interest.

The same covariates must be included in each of the regression analyses (Kenny, 2013). Mediation is said to exist if all three regressions are statistically significant, and if the relationship between the original predictor and the outcome variable has been significantly reduced following the inclusion of the mediator variable. The Sobel test (Sobel, 1982) is commonly used to ascertain whether the reduction is significant in nature.

However, despite its ongoing popularity, the Sobel test is not without its critics – Kenny (2013) no longer recommends its use and Hayes and Scharkow (2013) argue that the test lacks power, is unreliable and is too conservative, resulting in an inflated rate of Type I errors due to the all or nothing approach inherent in arbitrary significance testing levels.

An increasingly popular alternative method of calculating mediation has focussed on the calculation of the indirect effect by means of a bias-corrected bootstrapping approach (Bollen and Stine, 1990; Preacher and Hayes, 2004, 2008; Shrout and Bolger, 2002),

although Fritz, Taylor and MacKinnon (2012) have argued that the bootstrapping approach is potentially too liberal, and has a tendency towards Type II errors. The bootstrapping approach is a non-parametric method in which resampling with replacement is repeated many times (Preacher and Hayes [2008] recommended 5,000 bootstrap samples). An indirect effect is computed from each sample and a sampling distribution is generated.

A number of statistical software macros have been developed to facilitate the calculation of the indirect effect via bias-corrected bootstrapping using the most popular statistical software packages (www.afhayes.com). Meanwhile, Iacobucci and colleagues (2007; 2008) have alternatively argued for the superiority of structural equation modelling in the calculation of mediation effects.

One of the difficulties with the aforementioned recent developments is their inability to effectively handle categorical variables. The bootstrapping macros can process categorical independent variables and even categorical outcome variables, but they cannot currently process categorical mediators. While not entirely insurmountable, difficulties also present themselves with the older Baron and Kenny (1986) method using the Sobel test in circumstances where the analysis of mediation involves a mix of ordinary least squares and logistic regression equations.

Iacobucci (2012) proposed a parsimonious solution to what she has labelled the "final frontier" of mediation studies. While various adaptations of structural equation modelling exist which allow for the use of categorical mediators (Winship and Mare, 1983; Muthén,

1984), Iacobucci – herself a staunch advocate of structural equation modelling for almost all other cases – has been critical of them because of their demanding underlying assumptions and the challenges in their practical implementation. While a simultaneous calculation of all path coefficients in a single model is desirable in mediation analysis, Iacobucci rejected this approach where there is a question of categorical mediation.

Iacobucci's (2012) solution is conceptually similar to the Baron and Kenny (1986) approach, and involves three regression models and a final step in which the test statistic, $Z_{Mediation}$, is calculated:

- Firstly, establish that there is a direct relationship between the main predictor and outcome variable.

- Establish that there is a relationship between the mediator and the predictor variable. Collect the parameter estimate and its standard error.

- Establish that there is a relationship between the mediator and the outcome variable, controlling for the original predictor. Collect the parameter estimate and its standard error.

- Calculate $Z_{Mediation}$ by (i) dividing the respective parameter estimates by their standard errors to create standardised elements (z_a and z_b, respectively); (ii) multiplying z_a and z_b; (iii) dividing this product by the square root of their collective standard error ($z_a^2 + z_b^2 + 1$). $Z_{Mediation}$ is then tested against a standard normal distribution, and if it exceeds 1.96 it is significant at the 0.05 level.

The Iacobucci $Z_{Mediation}$ approach can be used with any combination of continuous and categorical variables and allows for testing different steps in the mediation analysis with

different types of regressions (ordinary least squares and/or logistic regressions). Her approach has been described as "intuitive, reliable and implementable" (Feinberg, 2012: 598).

Iacobucci's (2012) method of mediation with categorical variables has been adopted in this thesis when logistic regression models were used in the analysis of categorical mediating variables and the bias-corrected bootstrapping approach using the PROCESS macro for IBM SPSS (Hayes, 2013) has been used in multiple regression models with continuous mediators.

Chapter 5: Analysis of Research Propositions 1, 2 & 3.

5.1   Introduction

This chapter examines Research Propositions 1-3, and investigates the association between alcohol marketing communications and personal alcohol consumption (Research Proposition 1), as well as the relationship between social norm perceptions and alcohol consumption (Research Proposition 2). It then examines the indirect ways in which alcohol marketing communications might influence consumption through the mediating pathway of normative perceptions (Research Proposition 3).

If the data suggests a mediating pathway for the relationship between alcohol marketing communications and drinking behaviour via social norm perceptions, the analysis will provide a plausible explanatory pathway for *how* alcohol marketing communication is related to consumption, as well as undermining the industry argument that marketing doesn't matter because of the importance of peer influence.

Each of the following Research Propositions is examined with a series of regression analyses to test the underlying hypotheses.

5.2 Research Proposition 1: Consumption of alcohol marketing communications will be related to alcohol consumption.

Research Proposition 1 deals with the relationship between alcohol marketing and alcohol consumption. There is an ongoing debate in both the academic literature and the policy arena about this relationship, with the alcohol industry maintaining either that marketing does not influence consumption or that it is unimportant compared to peers, while critical marketers and public health advocates argue that marketing is an important contributor to drinking behaviour, especially among young people. Most studies in the field have adopted a rather one-dimensional perspective on the issue, focussing primarily on advertising, and downplaying or ignoring other aspects of the marketing mix (for exceptions see Gordon et al., 2011; Lin et al., 2012). In a commercial sphere increasingly characterised by integrated marketing communications, such a piecemeal approach can at best lead to a partial and incomplete understanding of the relationship between alcohol marketing and consumption.

This research takes a different approach by incorporating up to 17 different forms of alcohol marketing communications, more than prior cumulative studies that have been located. Furthermore, the research not only examines mere exposure to alcohol marketing communications, but also assesses levels of *active engagement* with marketing. Contemporary marketing managers desire greater interaction with consumers (Payne, Storbacka and Frow, 2008), and this explains some of the attraction of online and social media marketing for companies in general. By examining a large variety of forms of alcohol marketing across the marketing communications mix, and by incorporating a

measure of consumer interaction with marketing in general, and online marketing in particular, this study can contribute towards identifying the cumulative impact of alcohol marketing communications in a somewhat more realistic fashion than many prior studies that have examined one aspect of marketing in isolation from the rest.

The two outcome variables in this analysis are *personal frequency of drinking* and *personal frequency of drinking to get drunk.* To recap, as discussed in section 3.7.3, it was decided against focussing on the quantity of alcohol consumed due to concerns about the reliability of recall and the added complexity and burden of calculating standard units of alcohol for different types of alcoholic beverages, a burden that would be all the heavier when having to estimate quantities for a range of normative reference groups.

As outlined in section 3.3.1, six hypotheses were developed to test Research Proposition 1:

- H1a: Increased exposure to alcohol marketing communications will predict increased frequency of drinking alcohol.

- H1b: Increased engagement with alcohol marketing communications will predict increased frequency of drinking alcohol.

- H1c: Increased engagement with online alcohol marketing communications will predict frequency of drinking alcohol.

- H1d: Increased exposure to alcohol marketing communications will predict increased frequency of drinking alcohol to get drunk.

- H1e: Increased engagement with alcohol marketing communications will predict increased frequency of drinking alcohol to get drunk.

- H1f: Increased engagement with online alcohol marketing communications will predict frequency of drinking alcohol to get drunk.

Each hypothesis was tested with hierarchical logistic regression. In each model, variables were entered in blocks, with known predictors of alcohol consumption entered first. This hierarchical approach allowed the additional influences of each set of variables to be assessed. Block 1 controlled for family background - maternal, paternal and sibling drinking. Block 2 controlled for lifestyle factors - disposable income, age of drinking initiation, importance of fitness, importance of religion in making decisions and living conditions. Block 3 controlled for demographic factors - age, gender and ethnicity. Block 4 controlled for student status – whether respondents were studying for their finals. Block 5 tested for communication about marketing. This variable was included in order to test for interaction effects between marketing and communication about marketing (section 5.2.8). Block 6 tested for the relevant marketing variable – either exposure to alcohol marketing, engagement with alcohol marketing or engagement with alcohol marketing online, as appropriate.

5.2.1   H1a: Increased exposure to alcohol marketing communications will predict increased frequency of drinking alcohol.

The first logistic regression model examines the association between the number of different forms of marketing that respondents were exposed to within the past week, and their likelihood of drinking alcohol at least weekly, controlling for other known predictors of alcohol consumption. It was found that each extra form of marketing communications that respondents were exposed to within the past week was associated with an increase in the odds of drinking alcohol on a weekly basis of 8% (Adjusted Odds Ratio (AOR) = 1.08; $p < 0.01$. See Table 5 for more information.

The null hypothesis that there is no statistically significant association between exposure to alcohol marketing communications and weekly drinking status is rejected.

5.2.2 H1b: Increased engagement with alcohol marketing will predict increased frequency of drinking alcohol.

The second logistic regression model examines the association between the number of different types of alcohol marketing communications respondents had ever actively engaged with, and their likelihood of drinking alcohol at least weekly, controlling for other known predictors of alcohol consumption. It was found that each extra form of marketing communications that respondents had ever engaged with was associated with an increase in the odds of drinking on a weekly basis of 16% (AOR = 1.16; $p < 0.001$). See Table 6 for more information.

The null hypothesis that there is no statistically significant association between engagement with alcohol marketing communications and weekly drinking status is rejected.

5.2.3 H1c: Increased engagement with online alcohol marketing communications will predict frequency of drinking alcohol.

The third logistic regression model examined the association between the number of different types of online alcohol marketing communications respondents had ever actively engaged with and their likelihood of drinking alcohol at least weekly, controlling for other known predictors of alcohol consumption. It was found that each extra form of online marketing communications that respondents had ever engaged with was associated with an increase in the odds of drinking on a weekly basis of 17% (AOR = 1.17; $p < 0.001$). See Table 7 for more information.

The null hypothesis that there is no statistically significant association between engagement with online alcohol marketing communications and weekly drinking status is rejected.

5.2.4 H1d: Increased exposure to alcohol marketing communications will predict increased frequency of drinking alcohol to get drunk.

The fourth logistic regression model examines the association between the number of different types of alcohol marketing communications that respondents were exposed to within the past week, and their likelihood of drinking to get drunk on a weekly basis, controlling for other known predictors of alcohol consumption. After controlling for communication with peers about alcohol marketing, it was found that there was no statistically significant relationship between exposure to alcohol marketing communications within the past week and drinking to get drunk on a weekly basis (AOR = 1.04, p > 0.05).

The null hypothesis that there is no statistically significant association between exposure to alcohol marketing communications within the past week and drinking to get drunk on a weekly basis is not rejected.

5.2.5   H1e: Increased engagement with alcohol marketing will predict increased frequency of drinking alcohol to get drunk.

The fifth logistic regression model examines the association between the number of different types of alcohol marketing communications that respondents had ever engaged with, and their likelihood of drinking to get drunk on a weekly basis, controlling for other known predictors of alcohol consumption. It was found that each extra type of alcohol marketing that respondents had actively engaged with was associated with an increase in the odds of drinking to get drunk once per week or more of 7% (AOR = 1.07; $p < 0.01$). See Table 9 for more information.

The null hypothesis that there is no statistically significant association between engagement with marketing communications and drinking to get drunk on a weekly basis is rejected.

5.2.6   H1f: Increased engagement with online alcohol marketing communications will predict frequency of drinking alcohol to get drunk.

The sixth logistic regression model examines the association between the number of different types of online alcohol marketing communications that respondents had ever engaged with, and their likelihood of drinking to get drunk on a weekly basis, controlling for other known predictors of alcohol consumption. It was found that each extra type of online alcohol marketing that respondents had actively engaged with was associated with an increase in the odds of drinking to get drunk once per week or more of 7% (AOR = 1.07; $p < 0.05$). See Table 10 for more information.

The null hypothesis that there is no statistically significant association between engagement with online marketing communications and drinking to get drunk on a weekly basis is rejected.

5.2.7 Interaction effects

Each logistic regression model also tested for possible interaction effects between exposure to/engagement with alcohol marketing communications and communication about alcohol marketing. This was to test whether communication about alcohol marketing could enhance or amplify the association between alcohol marketing communications and alcohol consumption. While there was a statistically significant association between communication about alcohol marketing and alcohol consumption in five of the six logistic regression models described above, there was no statistically significant interaction effect in any of the six models. See Table 11 for further details.

5.2.8 Assessing model fit

A number of other (unreported) logistic regression models were run to assess how models with more than one marketing variable fit with the data. Because engagement with online marketing communications is a sub-scale of engagement with marketing communications, these variables were not tested together in any models. Comparative model fit was tested with Schwartz's Bayesian information criterion (Schwartz, 1978).

In relation to weekly drinking status, a model with only *engagement* with marketing communications fit the data better than a model with both e*ngagement* with marketing communications and *exposure* to marketing communications within the past week, based on a difference 6.961 in the BIC measure of fit. Similarly, a model with *engagement* with online marketing communications fit the data better than a model with both *engagement* with online marketing communications and *exposure* to marketing communications within

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the past week based on a difference of 5.82 in the BIC measure of fit. Overall, the logistic regression models outlined in Tables 5-10 showed that a model with just *engagement* with marketing communications fit the data best, followed in order by one with just *engagement with online marketing* and then one with just *exposure* to marketing within the past week.

In relation to drinking to get drunk once per week or more, a model with only *engagement* with marketing communications fit the data better than a model with both *engagement* with marketing communications and *exposure* to marketing communications within the past week, based on a difference 6.954 in the BIC measure of fit. Similarly, a model with *engagement* with online marketing communications fit the data better than a model with both e*ngagement* with online marketing communications and *exposure* to marketing communications within the past week based on a difference of 6.709 in the BIC measure of fit. Overall, the logistic regression models outlined in Tables 5-10 showed that a model with just *engagement* with marketing communications fit the data best, followed in order by one with just *engagement with online marketing* and then one with just *exposure* to marketing within the past week.

For this reason, all subsequent models that examine the indirect influence of alcohol marketing communications on personal drinking via normative perceptions will use *engagement* with alcohol marketing communications as the primary marketing variable of interest.

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5.2.9 Research Proposition 1: Conclusion

There was strong support for five of the six hypotheses underpinning Research Proposition 1. Even controlling for prior predictors of alcohol consumption, in most models each extra type of exposure to, or engagement with, alcohol marketing was associated with an increase in the odds of weekly drinking, or drinking to get drunk, of approximately 6 or 7%. In the model in which the strongest relationships were evident, each extra type of *engagement* with alcohol marketing communications was associated with a 16% increase in the odds of drinking alcohol on a weekly basis.

Given the number of different ways in which students could be exposed to, or interact with, alcohol marketing, these increased odds have significant practical implications, as revealed by an analysis of the cumulative odds ratios (Vittinghoff et al., 2005). The average respondent was *exposed* to 8 different types of alcohol marketing within the past week, and *engaged* with 7 different types of alcohol marketing and, more specifically, with 4 different types of online marketing. This means that, after controlling for other predictors of alcohol consumption, compared to respondents who were not exposed to, or who had not engaged with, alcohol marketing communications:

- merely being exposed to an average amount of alcohol marketing within the past week was associated with an 85% increase in the odds of drinking on a weekly basis;
- having a merely average level of engagement with alcohol marketing communications was associated with a 282% increase in the odds of drinking alcohol on a weekly basis and with a 60% increase in the odds of drinking to get drunk on a weekly basis;

- having a merely average level of engagement with online marketing communications was associated with an 87% increase in the odds of drinking on a weekly basis and a 31% increase in the odds of drinking to get drunk on a weekly basis.

Due to the cross-sectional nature of the research, causality cannot be established. Further, while a large number of potentially confounding variables were included in the models, there may be other unmeasured, or unmeasurable, factors that would influence this relationship. Nonetheless, the findings are consistent with many prior consumer-based studies on the effects of alcohol marketing on personal drinking behaviour (Gordon et al., 2011; Lin et al., 2012) and stand in stark contrast with the econometric studies often utilised by the alcohol industry to argue that alcohol marketing does not influence consumption levels and is limited to mere brand-level effects (see section 1.4 for a more complete analysis of this debate). However, far from merely confirming past research, the findings of Research Proposition 1 extends prior knowledge in several important directions.

In the first instance, this research provides an evidence base for the association between alcohol marketing and consumption in an Irish context. Despite the well documented social, economic and health consequences of Irish alcohol consumption patterns, and an ongoing and controversial political debate about the regulation of alcohol marketing in Ireland, there has been a surprising lack of primary research about the role of alcohol marketing communications in the Irish context. Prior research in Ireland has been qualitative in nature and has used very small samples (Dring and Hope, 2001), or has been funded by the alcohol industry and, consequently, focused on other antecedents of youth

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alcohol consumption, ignoring entirely the very existence of alcohol marketing (Delaney, Harmon and Wall, 2008). This research addresses an important gap in the Irish knowledge base.

Secondly, while most research has focussed on drinking quantities, this research has examined drinking frequencies. Specifically, the research has utilised a measure of frequency of drinking to get drunk – and it appears that this is the first time that such a measure has been adopted in the research literature. The strong association between engagement with alcohol marketing and drinking to get drunk – a deliberate, premeditated and objectively dangerous relationship with alcohol – suggests a note of urgency for policymakers charged with regulation in this sphere.

Thirdly, the research extends far beyond alcohol advertising effects, which have been the predominant focus of most prior research efforts globally. By addressing the wider marketing communications mix, the research presents a more realistic view of the cumulative impact of integrated alcohol marketing communications on consumption behaviour. This assumes a further significance in a policy context in which the restriction of sponsorship of sporting activities by the alcohol industry is on the Irish legislative agenda. By addressing the wider marketing mix, specifically including sponsorship, the research can inform this policy debate.

Fourthly, and perhaps most importantly, the research indicates that, while exposure to alcohol marketing communications is important, it is *active engagement* with alcohol marketing that is more strongly associated with behaviour. One feature of the

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contemporary alcohol policy debate is the restriction of traditional forms of alcohol advertising. But these restrictions are unlikely to have the effect of reducing marketing budgets in the alcohol industry. Rather, budgets have already shifted towards novel forms of marketing, and specifically online marketing communications, particularly in the social media sphere (Mosher, 2012). Because of their very targeted nature, online marketing communications are likely to operate below the radar of many regulators. Yet this research suggests that the interactivity inherent in online marketing renders it even more potent than the traditional advertising that it may, in part, replace. This finding is reinforced by the surprising results of an unanticipated supplementary analysis which further highlighted the crucial role of interactivity (see section 5.4.6). Specific policy implications flow from this, and will be discussed in the concluding chapter.

5.3   Research Proposition 2: Different types of social norm perceptions will be independently related to behaviour

As outlined in Chapter 2, there are different types of social norms, each of which may influence behaviour in a variety of complex ways. To recap, social norms can broadly be categorised as either *descriptive* or *prescriptive*. Descriptive norms refer to perceptions of what others do, whereas prescriptive norms refer to the attitudes of others. Prescriptive norms can be sub-divided into two different categories – *injunctive norms* which refer to the attitudes of others towards the relevant behaviour in general, and *subjective norms* which refer to the attitudes of significant others towards *my* behaviour.

One of the criticisms of the social norms approach to behaviour change is that it generally fails to take prescriptive norms into account. However, recent work, especially on the Focus Theory of Normative Conduct (Reno et al., 1993) and the Theory of Normative Social Behaviour (Rimal, 2008) have both emphasised the importance of injunctive norms as a form of normative influence that is related to, but distinct from, descriptive norms. Further, subjective norms are often treated as analogous to injunctive norms, and are not distinguished from them.

Research Proposition 2 seeks to examine whether different types of social norms have a distinct relationship with behaviour, and it is assessed with the following hypothesis:

H2: Perceived descriptive, injunctive and subjective norms will each be independently associated with frequency of drinking alcohol to get drunk.

5.3.1   Analytical strategy

As discussed in Chapter 3, while descriptive norm perceptions were assessed for two drinking behaviours (frequency of drinking and frequency of drinking to get drunk), prescriptive norms were only assessed for the more intentionally extreme behaviour (in public health terms) of drinking to get drunk. This was necessary in the Irish context because it was felt that few people would perceive that drinking alcohol frequently was unacceptable. As a result of this, the differential impact of different types of norms was assessed only for their relationship with drinking to get drunk on a weekly basis.

Analysis was conducted with hierarchical binary logistic regression. The dependent variable was frequency of drinking to get drunk divided into the categories of less than once per week, and once per week or more. Predictor variables were entered in blocks, with known predictors of alcohol consumption entered first. This hierarchical approach allowed the additional influences of each set of variables to be assessed. Block 1 controlled for family background - maternal, paternal and sibling drinking. Block 2 controlled for lifestyle factors - disposable income, age of drinking initiation, importance of fitness, importance of religion in making decisions and living conditions. Block 3 controlled for demographic factors - age, gender and ethnicity. Block 4 controlled for student status – whether respondents were studying for their final exams. Block 5 tested for communication about marketing. Block 6 controlled for engagement with marketing. This particular block was added because prior analysis (section 5.2) indicated the importance of this variable in predicting frequency of drinking to get drunk, and because this specific model was not used as part of mediation testing, but rather to assess the relative influence of different social norm types having controlled for other known or likely predictors.

Susceptibility to normative influence was entered in Block 7. This has been proposed as a general trait which measures a personal predisposition to be swayed by social norm influences. Descriptive norms were added in three successive blocks, one each for perceived frequency of drinking to get drunk by close friends, the average DIT student and the average person of the same age in Ireland. Descriptive norms were added in separate steps to allow for a closer examination of the relative impact of perceived norms of different reference groups on behaviour, and they were entered in this order because prior research indicated the relative importance of proximal normative reference groups over distal normative reference groups (Voogt et al., 2013). The universal injunctive norm variable which was created in order to amalgamate all injunctive norm variables was entered in Block 11. Finally, two subjective norm measures were entered in Block 12 – a variable which combined the measures of subjective norms of close friends for drinking to get drunk on weekdays and at weekends (α = .957) and another which combined the same measures for subjective norms for parents (α = 893.). Please see Table 12 for complete details of each block.

The sample size for Research Proposition 2 was marginally smaller than for the other analyses (N = 1,051) in order to take account of the twenty respondents who did not answer one of the questions relating to subjective norms. These questions were optional in order to cater for sensitive personal situations in which a respondent might have been unable to answer the personally oriented questions relating to family members.

5.3.2   Results

Perceived descriptive norms of frequency of drinking to get drunk by close friends was entered into the model in Block 8. Controlling for other established demographic and behavioural predictors of alcohol consumption, perceived descriptive norms of close friends was a significant predictor of personal frequency of drinking to get drunk, χ^2 (df = 1, N = 1,051) = 344.366, AOR = 127.14[2], p <0.001. When perceived descriptive norms for close friend drinking was included in the model, neither perceived descriptive norms for the average DIT student, χ^2 (df = 1, N = 1,051) = 1.81, p = 0.177, nor perceived descriptive norms for the average person of the same age, χ^2 (df = 1, N = 1,051) = 0.04, p = 0.951, were significant predictors of personal drinking to get drunk.

Controlling for other established predictors of consumption, including perceived descriptive norms, perceived injunctive norms (measured with the newly created universal injunctive norms variable) was not a significant predictor of frequency of drinking to get drunk χ^2 (df = 1, N = 1,051) = 0.24, p = 0.627.

The final block in the model examined perceived subjective norms. Controlling for other predictors of alcohol consumption, including descriptive and injunctive norms, the final block made a significant contribution to the model, χ^2 (df = 1, N = 1,051) = 14.06, p <0.01. However, only perceived subjective norms of close friends were significant (AOR = 1.01, p <0.01), whereas the perceived subjective norms of parents were not significant (p = 0.319).

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[2] The very high odds ratio in this model would seem to be due to the social nature of the drinking behaviour in question – it would appear that few respondents drink to get drunk on a solitary basis, but rather do so because their close friends are doing it. Apart from very problematic forms of solitary binge drinking, drinking to get drunk appears to be very social in nature, and seen in this light the high odds ratio is not unexpected.

5.3.3   Interaction effects

Further (unreported) logistic regression models were tested to establish if susceptibility to normative influence moderated the relationship between normative perceptions and personal frequency of drinking to get drunk, on the basis that normative perceptions might be a more powerful influence on the behaviour of those with a predisposition towards normative influence susceptibility. Interactions were tested with perceived descriptive norms for close friends χ^2 (df = 1, N = 1,051) = 1.84, p = 0.171; the average DIT student χ^2 (df = 1, N = 1,051) = 0.37, p = 0.542 and for the average person on the same age in Ireland χ^2 (df = 1, N = 1,051) = 1.19, p = 0.278, as well as for perceived injunctive norms χ^2 (df = 1, N = 1,051) = 0.59, p = 0.445. In none of these instances was a significant interaction effect found. Moderation was not tested with perceived subjective norms because the measure of subjective norms used in the analysis already includes a measure of motivation to comply with the subjective norms in question.

5.3.4 Research Proposition 2: Conclusion

The data presents mixed support for H2. While the powerful role of descriptive norms amongst close friends is evident, the data does not support a unique contribution of injunctive norms on personal frequency of drinking to get drunk once perceived descriptive norms have been controlled for. However, the data offers partial support for a unique association between subjective norms and drinking behaviour. The perceived subjective norms of close friends were a significant predictor of personal consumption; the perceived subjective norms of parents were not.

The results of this analysis clearly differ from some prior studies in the literature that have identified perceived injunctive norms as a powerful predictor of behaviours (Bobek, Roberts and Sweeney, 2007; Larimer et al., 2004). Indeed, based on a review of the social norms marketing literature, John and Allwyn (2010) go so far as to argue that perceived injunctive norms are a better predictor of personal consumption than perceived descriptive norms.

The results of this analysis more closely coincide with the work of Neighbors et al (2008) who examined the differential impact of injunctive and descriptive norms on drinking behaviour. They found that injunctive norms for proximal reference groups such as friends and parents (conceptualised as subjective norms in this thesis) were positively associated with behaviours, whereas perceived injunctive norms for distal groups such as typical students (a measure very similar to the one used in this study) were in fact negatively related to behaviour. Somewhat similar results were found by some of the same researchers in an analogous study of norms and gambling – proximal injunctive

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norms were positively associated with personal gambling whereas the distal injunctive norm of the typical student was negatively associated with personal behaviour (Neighbors at al., 2007c). This mirrors other work by Mallett, Bachrach and Turrisi (2009) which also found that the perceived injunctive norms of typical students were not significantly associated with personal alcohol consumption.

This points to a complex and incompletely understood set of relationships between each of the different types of norms, and between norms and behaviours. Neighbors et al (2008) correctly argue that salience is of overwhelming importance when considering norms in general and injunctive norms in particular, and that studies that have proposed perceived injunctive norms as being more powerful than perceived descriptive norms have likely done so by inadvertently masking the impact of reference group effects.

This research confirms the importance norm salience. The most important normative influences on personal drinking to get drunk were the perceptions of what close friends did, and perceptions of how close friends would perceive the behaviour of the respondents. This has potentially significant practical implications for the use of social norms interventions to amend student drinking behaviour in the Irish context.

While the data does not support a unique contribution of injunctive norms over and above that of descriptive norms, it does, in part, support a unique contribution of subjective norms over and above that of both descriptive and injunctive norms, and suggests that injunctive and subjective norms may be distinct sources of influence, though in reality this may all boil down to the relative salience of different reference groups.

The null hypothesis that perceived descriptive, injunctive and subjective norms will not each be independently associated with frequency of drinking alcohol to get drunk is partially rejected.

5.4 Research Proposition 3: Perceived norms will partially mediate the relationship between alcohol marketing and alcohol consumption.

The international research suggests that social norms are amongst the strongest predictors of human behaviour in many contexts, including that of alcohol consumption. This is reflected in the analysis conducted for Research Proposition 2. However, relatively little research has been done to uncover the source of social norm perceptions.

Similarly, there is an active debate on the impact of alcohol marketing on consumption, with proponents of the alcohol industry arguing that marketing does not influence consumption patterns, but is merely limited to brand-level choices, or that if it has any influence on drinking behaviour that it is inferior to that of peers. On the other hand, critical marketers and public health advocates have argued that alcohol marketing operates at the level of behavioural decision making and not just the level of the brand, and that alcohol marketing influences alcohol consumption behaviours. While recent longitudinal work (Smith and Foxcroft, 2009) has provided empirical support for those who are critical of the alcohol industry, little work has been done to examine specific pathways through which marketing might influence alcohol consumption behaviours. Research on alcohol marketing communications needs to move beyond the settled question of *whether* marketing influences alcohol consumption to *how* and *when* it influences it.

This thesis proposes that alcohol marketing is one of the antecedents of social norm perceptions, and that the relationship between alcohol marketing communications and

alcohol consumption is likely to be mediated via normative perceptions that were created, in part, by marketing.

This research proposition is tested with 3 research hypotheses.

- H3a: Perceived descriptive norms will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol

- H3b: Perceived descriptive norms will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk

- H3c: Perceived injunctive norms will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk

5.4.1   Analytical strategy

Prior to testing each of these hypotheses, it is necessary to establish which descriptive norm variables to use in these analyses. As previously outlined in section 4.6, it was decided to keep the 3 separate descriptive norm reference group variables because the use of the weighted descriptive norm index violated the assumption of linearity with the logit. However, having three separate descriptive norm variables was unwieldy and added unnecessary complexity to the analysis.

When examining frequency of drinking to get drunk as an outcome variable (H3b) it was decided to use only perceived descriptive norms for friends as the mediating variable because this variable was the most influential normative variable in explaining frequency

of drinking to get drunk, and because all other descriptive norm variables were non-significant when this variable was included in the model (see 5.3.2 for details).

In order to establish the most appropriate descriptive norm variable for H3a, which is based around frequency of drinking, a similar logistic regression analysis was conducted with the three descriptive norm variables related to frequency of drinking, with perceived descriptive norms for frequency of drinking by close friends, the average DIT student and the average person of the same age each entered into the model in separate blocks after controlling for prior predictors of alcohol consumption. Prescriptive norms were not relevant for the frequency of drinking outcome variable.

As with the case of perceived norms of drinking to get drunk, the perceived norms of close friends was a significant predictor of personal frequency of drinking χ^2 (df = 1, N = 1,071) = 297.936, AOR = 19.728[3], p < 0.001. When perceived norms for close friend frequency of drinking were controlled for in the model, the perceived norms of the average DIT student χ^2 (df = 1, N = 1,071) = 0.005, p = 0.943 and of the average person of the same age χ^2 (df = 1, N = 1,071) = 0.259, p = 0.611 were not significant. See Table 13 for further details.

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[3] The high odds ratio in this model would seem to be due to the social nature of alcohol consumption. Because alcohol is a social lubricant, it stands to reason that the odds of drinking are high if close friends drink frequently. It is worth noting that, while the odds ratio is high, it is not as high as the odds ratios associated with close friend drinking to get drunk (see sections 5.3.2 and 5.4.3). While personal drinking frequency is strongly associated with close friend drinking, drinking to get drunk is considerably more strongly associated with perceived behaviour of close friends in these models.

Based on this analysis, it was decided to use only perceived descriptive norms of frequency of drinking for close friends as the descriptive norm mediator when testing mediation effects. This has the added advantage of consistency in the use of variables for all mediation models.

As previously noted, a decision also had to be made in relation to which of the 3 marketing variables to use in the mediation analyses: (i) exposure to alcohol marketing communications within the past week; (ii) engagement with alcohol marketing communications or (iii) engagement with alcohol marketing communications online. The analysis presented when discussing Research Proposition 1 indicated that models incorporating engagement with alcohol marketing communications fit the data best, and it was decided to utilise this variable as the marketing variable of interest in the mediation analyses.

The same control variables were used in each of the regression models, prior to entering the predictors of interest into the model (Kenny, 2013). Variables were entered in blocks, with known predictors of alcohol consumption entered first in all models. Block 1 controlled for family background - maternal, paternal and sibling drinking. Block 2 controlled for lifestyle factors - disposable income, age of drinking initiation, importance of fitness, importance of religion in making decisions and living conditions. Block 3 controlled for demographic factors - age, gender and ethnicity. Block 4 controlled for student status – whether respondents were studying for their finals. Block 5 tested for communication about marketing. Following this the relevant predictors were entered, depending on the regression model in question.

5.4.2 H3a: Perceived descriptive norms will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol

The steps advocated by Iacobucci (2012) to test for mediation are as follows:

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

The analysis reported for H1b has established that the relationship between engagement with marketing communications and personal frequency of drinking is statistically significant (AOR = 1.16, p < 0.001).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 14, there is a statistically significant association between perceived frequency of close friend drinking and engagement with marketing (AOR = 1.128, p < 0.001).

Step 3: Establish that the mediator is significantly associated with the outcome variable, controlling for the main predictor

Controlling for engagement with alcohol marketing communications, there is a statistically significant, and strong, relationship between perceived frequency of drinking by close friends and personal frequency of drinking (AOR = 19.03, p < 0.001).

Step 4: Calculate the $Z_{Mediation}$ score

Using the parameter estimates and associated standard errors in Steps 2 and 3,

$Z_{\text{DescriptiveNormDrink}}$ = 3.55 (p < 0.001), indicating support for a significant mediation effect of

perceived close friend drinking frequency on the relationship between engagement with

alcohol marketing communications and personal frequency of drinking.

**The null hypothesis that perceived descriptive norms of frequency of drinking do not
mediate the relationship between engagement with alcohol marketing communications
and personal frequency of drinking is rejected.**

5.4.3   H3b: Perceived descriptive norms will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

The analysis reported for H1e has established that the relationship between engagement with marketing communications and personal frequency of drinking to get drunk is statistically significant (AOR = 1.07, p < 0.01).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 15, there is a statistically significant association between engagement with marketing and perceived frequency of close friend drinking to get drunk (AOR = 1.05, p < 0.05).

Step 3: Establish that the mediator is significantly associated with the outcome variable, controlling for the main predictor

Controlling for engagement with alcohol marketing communications, there is a statistically significant, and strong, relationship between perceived frequency of drinking to get drunk by close friends and personal frequency of drinking to get drunk (AOR = 159.94[4], p < 0.001).

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[4] Similar to section 5.3.2, the very high odds ratio in this model would seem to be due to the social nature of drinking to get drunk – it would appear that few respondents drink to get drunk on a solitary basis, but rather do so because their close friends are doing it. As such, the very high odds ratio is not unexpected.

Step 4: Calculate the $Z_{Mediation}$ score

Using the parameter estimates and associated standard errors in Steps 2 and 3, $Z_{DescriptiveNormDrunk}$ = 2.38 (p < 0.05), indicating support for a significant mediation effect of perceived close friend frequency of drinking to get drunk on the relationship between engagement with alcohol marketing communications and personal frequency of drinking to get drunk.

The null hypothesis that perceived descriptive norms of drinking to get drunk do not mediate the relationship between engagement with alcohol marketing communications and personal frequency of drinking to get drunk is rejected.

5.4.4 H3c: Perceived injunctive norms will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk

As outlined in Research Proposition 2, injunctive norms were not significantly related to personal frequency of drinking to get drunk when perceived descriptive norms of close friends, the average DIT student and the average person of the same age are controlled for. In theory, this suggests that when descriptive norms are taken into account, injunctive norms may not act as a mediator of the relationship between alcohol marketing communications and frequency of drinking to get drunk. However, because the relationship between different types of social norms are complex and as yet imperfectly understood, it seems that it may be worthwhile to test for a mediating role of injunctive norms without controlling for descriptive norms. Furthermore, having to control for descriptive norms in the mediator-outcome relationship would also necessitate controlling for descriptive norms in all other associated regression analyses concerned with this specific mediation relationship (Kenny, 2013). Prior analysis has confirmed that descriptive norms mediate the relationship between alcohol communications and frequency of drinking to get drunk, and it is not recommended that mediators be controlled for when investigating the variable that they mediate (Ditlevsen, 2005). Further, as argued by Hayes (2009), it is not always necessary for the main predictor to be directly related to the outcome variable for an indirect effect to exist. For these reasons, it was decided to proceed to testing H3c.

As previously outlined, injunctive norms were measured on a continuous scale. While it is possible to use the Iacobucci (2012) method to investigate mediation relationships with a

continuous mediator, in such circumstances it is recommended to use a bootstrapping re-sampling technique using confidence intervals to test for mediation (Bollen and Stine, 1990). If the confidence intervals do not contain zero, then there is evidence that the indirect effect is different from zero and that an indirect, or mediating, relationship exists. In this instance, the PROCESS macro for IBM SPSS developed by Hayes (2013) was utilised to estimate indirect effects using 5,000 bootstrap samples with bias corrected confidence intervals (Preacher and Hayes, 2008). Each regression controlled for important covariates as previously described in prior analyses.

The analysis revealed that there was a small but significant indirect effect of engagement with alcohol marketing communications on frequency of drinking to get drunk through perceived injunctive norms, $b = 0.0056$, 95% BC CI [0.0007, 0.0140]. More details are provided in Figure 7.

The null hypothesis that perceived injunctive norms of drinking to get drunk do not mediate the relationship between engagement with alcohol marketing communications and personal frequency of drinking to get drunk is rejected.

5.4.5   Research Proposition 3: Conclusion

The data provides evidence to support the hypothesis that both perceived descriptive and injunctive norms mediate the relationship between engagement with alcohol marketing communications and personal drinking behaviour. The data is correlational in nature and therefore does not indicate causation. However, the findings are consistent with longitudinal studies examining somewhat similar indirect influences of mass media via perceived norms in the fields of smoking (Gunther et al., 2006) and sexual behaviours (Chia, 2006; Chia and Gunther, 2006). While these studies examined behaviours other than alcohol consumption, and proposed a somewhat more convoluted indirect pathway for normative influence by utilising the theory of presumed influence (Gunther and Storey, 2003), the basic finding of an indirect pathway for media influence via perceived norms argues against a reverse causal explanation in the present study. Similarly, Brown, Moodie and Hastings (2009) found that normative perceptions were an indirect pathway through which public policy initiatives influenced smoking behaviours. Again, while their longitudinal study has a different focus than the present one, their basic support for an indirect normative pathway aligns with the indirect pathway proposed in this research.

The descriptive norms variables utilised in this study related only to close friends. While it is certainly theoretically plausible that engagement with a range of common types of marketing communications would provide an insight into the behaviour of close friends, this relationship is not entirely conceptually satisfying. Theoretically, one of the ways in which social norms might provide an indirect path for the influence of marketing is by providing clues as to how individuals behave. But this seems like a better explanation when it comes to distal groups (like the average student or person of the same age, which

were utilised for injunctive norms) than with more proximal groups like friends – is it really the case that individuals would rely on marketing in order to draw inferences about the behaviour of friends?

It would be more conceptually satisfying if a more direct connection could be made between alcohol marketing and the behaviour of friends. One way of doing this is through a closer examination of the measure of engagement with alcohol marketing. This measure is comprised of 17 different common types of marketing communications to which Irish students could be exposed. While 12 of these 17 relate to online engagement with alcohol marketing, 7 of these 12 different forms of engagement with marketing communications directly relate to *online social media*, including engaging with alcohol brands on social media and sharing marketing communications with others online.

Social media interaction with brands happens in full view of peers, and may be forwarded to consumers by their own peers, and in turn forwarded on to other peers of the consumer. Social media interaction is inherently public and visible to peer networks.

Interaction with friends through social media is now a normal and well established behaviour for many students, and it has been shown to be associated with increased rates of alcohol and tobacco consumption (Huang et al., 2013). It would be conceptually neater if there was evidence to suggest that perceived descriptive norms of close friends mediated the relationship between engagement with social media marketing communications and personal alcohol consumption. It would also be considerably more intellectually satisfying if the marketing-perceived norms relationship was *stronger* in the

case of social media engagement than the more broadly based measures of engagement with marketing.

With this in mind, 2 further supplementary mediation analyses were conducted to examine a potentially mediating role for perceived descriptive norms relating to close friends in the relationship between engagement with *social media marketing communications* and personal alcohol consumption measured in two separate ways: (i) frequency of drinking and (ii) frequency of drinking to get drunk.

5.4.6   Supplementary mediation analyses

<u>Frequency of drinking</u>

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

A logistic regression analysis was conducted which confirmed that engagement with marketing communications in social media was significantly associated with personal frequency of drinking to get drunk (AOR = 1.28, p = < 0.001). *Interestingly, engagement with marketing communications in social media was more strongly associated with weekly alcohol consumption than the more broadly based generic measure of engagement with alcohol marketing communications (AOR = 1.16).*

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 16, there is a statistically significant association between engagement with alcohol marketing via social media and perceived frequency of close friend drinking (AOR = 1.17, p < 0.05). *Significantly, there was also a stronger relationship here than there was between the broadly based generic measure of engagement with marketing and perceived drinking of close friends* (AOR = 1.12, p <0.05).

Step 3: Establish that the mediator is significantly associated with the outcome variable, controlling for the main predictor

Logistic regression analysis showed that, controlling for engagement with alcohol communications in social media, there is a statistically significant, and strong, relationship

between perceived frequency of drinking by close friends and personal frequency of drinking (AOR = 20.33[5], p < 0.001).

Step 4: Calculate the $Z_{Mediation}$ score

Using the parameter estimates and associated standard errors in Steps 2 and 3, $Z_{DescriptiveNormDrink}$ = 2.35 (p < 0.05), indicating support for a significant mediation effect of perceived close friend frequency of drinking on the relationship between engagement with alcohol marketing communications in social media and personal frequency of drinking.

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[5] The high odds ratio in this model is very similar to that found in section 5.4.1, which also looked at perceived close friend drinking frequency as a predictor of personal drinking frequency. Given the inherently social nature of much alcohol-related behaviours, these high odds ratios are not surprising.

Frequency of drinking to get drunk

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

A logistic regression analysis was conducted which confirmed that engagement with marketing communications in social media was significantly associated with personal frequency of drinking to get drunk (AOR = 1.16, p < 0.01). *Interestingly, engagement with marketing communications in social media was more strongly associated with weekly drinking to get drunk than the more broadly based generic measure of engagement with alcohol marketing communications* (AOR = 1.07; p < 0.01).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 17, there is a statistically significant association between engagement with alcohol marketing via social media and perceived frequency of close friend drinking to get drunk (AOR = 1.05, p < 0.05). The strength of this relationship was the same as that between the broadly based generic measure of engagement with marketing and perceived drinking of close friends (AOR = 1.05, p < 0.05).

Step 3: Establish that the mediator is significantly associated with the outcome variable, controlling for the main predictor

Logistic regression analysis showed that, controlling for engagement with alcohol communications in social media, there is a statistically significant, and strong, relationship

between perceived frequency of drinking to get drunk by close friends and personal frequency of drinking (AOR = 161.68[6], p < 0.001).

Step 4: Calculate the $Z_{Mediation}$ score

Using the parameter estimates and associated standard errors in Steps 2 and 3, $Z_{DescriptiveNormDrunk}$ = 2.09 (p < 0.05), which is consistent with a significant mediation effect of close friend frequency of drinking to get drunk on the relationship between engagement with alcohol marketing communications in social media and personal frequency of drinking to get drunk.

Overall, the data strongly suggests the existence of a set of structural relationships whereby engagement with marketing provides clues as to the behaviour of others. It also suggests that this perceived behaviour could act as an indirect pathway for the influence of alcohol marketing on personal drinking behaviour. There is a conceptual neatness attached to the increased power of specifically social media marketing engagement to predict perceived norms of close friends.

The fact that, in most cases, the relationships between engagement with social media marketing and perceived close friend drinking are stronger than when the more broadly based generic measure of alcohol marketing is utilised seems extremely important and suggests an unanticipated laddering effect whereby increasing levels of interaction appear to be associated with enhanced marketing effects, with marketing more strongly

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[6] Similar to sections 5.3.2 and 5.4.3, this very high odds ratio is not surprising given the nature of the drinking behaviour under investigation.

associated consumption when there is simultaneous interaction with both marketing and peers. This laddering effect is shown more clearly in Tables 37 and 38. It would appear that social media communications may be an even more powerful vehicle for the transmission of normative information than other forms of marketing precisely because it facilitates a confluence of interactivity with both marketing and peers. As the Focus Theory of Normative Conduct (Cialdini et al., 1990) suggests, norms are more powerful when made salient. That is precisely what happens with social media marketing for alcohol which allows a simultaneous interaction with peers and marketing – the interaction highlights peer alcohol norms, and it is this increased salience that may, in part explain the increased power of social media marketing relative to other forms of marketing.

Chapter 6: Discussion and conclusions

6.1   Introduction

There is a contentious academic and public policy debate about the relationship between alcohol marketing communications and alcohol consumption. The alcohol industry, relying on econometric modelling, argues that alcohol marketing is limited to brand level effects and does not influence consumption volumes or patterns (Alcohol Beverage Federation of Ireland, 2011; Laure, 2013). Public health advocates and critical marketers have taken a contrary position, relying on consumer-based studies to argue that the effects of alcohol marketing go far beyond product choice decisions and instead influence individual alcohol consumption behaviours (Hastings and Sheron, 2013). This position has been confirmed by over a dozen recent longitudinal studies - capable of detecting causal relationships – which indicate a dose-response relationship between exposure to alcohol marketing and consumption (Anderson et al., 2009). There is now a need for research to move from *whether* alcohol marketing communications influence alcohol consumption to *how* and *when* such influence occurs (Dobson, 2012).

In addition to addressing these *how* and *when* questions, by harnessing the insights presented by social norms theory this thesis also tackles the alcohol industry argument that marketing doesn't matter because of peer influence. A substantial body of empirical work suggests that perceived social norms are one of the most powerful drivers of human behaviour in a wide variety of behavioural contexts, including alcohol consumption (see Chapter 2 for a comprehensive review of this literature).

However, there has been relatively little work examining the antecedents of perceived alcohol social norms. The central argument of this thesis is (i) that alcohol marketing is strongly associated with alcohol consumption; (ii) that this relationship is enhanced as levels of interaction between the consumer, the brand and the consumer's peers increase, especially in social media marketing which facilitates simultaneous interaction between brands, consumers and peers; (iii) that alcohol marketing is associated with perceived social norms about alcohol consumption, and (iv) that these normative perceptions may be an indirect pathway through which marketing influences alcohol consumption. Secondary (and still unique) arguments about the role of misperceived social norms, and the relationship between marketing communications and attitudes towards non-drinkers, have also been established and are discussed in Appendix IV.

These arguments have been tested by means of 8 Research Propositions, each of which is underpinned by a number of supporting hypotheses. The research has been conducted in an Irish context which adds a further new dimension to this research – Irish society is characterised by heavy drinking patterns, particularly amongst the young, but paradoxically there is scant research on the effects of alcohol marketing in Ireland.

Earlier chapters (1 and 2) have examined the academic debate and policy context of alcohol marketing as well as the important role of perceived social norms in influencing behaviour. Chapter 3 has reviewed the methods employed in this research and Chapters 4 and 5 have provided a detailed analysis of the data as well as some preliminary discussion and conclusions on the 3 core Research Propositions, with similar treatment being given

the remaining 5 secondary (but still important and unique) Research Propositions in Appendix III.

In this chapter, the major contributions of this thesis to the academic and policy debate are reviewed, the theoretical and practical implications are assessed, limitations of the research are outlined and recommendations for future research agendas are discussed.

6.2   Core findings of Research Propositions 1, 2 and 3.

The most significant contributions of this thesis are found in Research Propositions 1-3 which examine the relationship between alcohol marketing communications and alcohol consumption (Research Proposition 1), the relationship between perceived social norms and alcohol consumption (Research Proposition 2) and the indirect relationship between alcohol marketing communications and alcohol consumption through the mediation of perceived social norms (Research Proposition 3). In summary, the findings are as follows.

6.2.1   Alcohol marketing and consumption (Research Proposition 1)

Research Proposition 1 shows a strong and significant relationship between exposure to, or engagement with, alcohol marketing communications and personal drinking, controlling for other known predictors of alcohol consumption. In particular:

- Each extra exposure to alcohol marketing communications within the past week was associated with an increase in the odds of *weekly drinking* of 8% (AOR = 1.08. $p < 0.01$).

- Each extra type of engagement with alcohol marketing communications was associated with an increase in the odds of *weekly drinking* of 16% (AOR = 1.16, $p < 0.001$).

- Each extra type of engagement with alcohol marketing communications online was associated with an increase in the odds of *weekly drinking* of 17% (AOR = 1.17, $p < 0.001$).

- Each extra type of engagement with alcohol marketing communications was associated with an increase in the odds of *drinking to get drunk* on a weekly basis of 7% (AOR = 1.07, p < 0.01).

- Each extra type of engagement with alcohol marketing communications online was associated with an increase in the odds of *drinking to get drunk* on a weekly basis of 7% (AOR = 1.07, p < 0.05).

Given the large number of marketing channels through which respondents could have been exposed to, or have engaged with, alcohol marketing, the potential cumulative and mutually reinforcing impact of alcohol marketing communications across several channels would appear to be of great practical significance.

These results are remarkably similar to other studies that also used cumulative measures of exposure in other countries, For example, Lin et al. (2012) found that awareness of each different alcohol marketing channel increased the odds of being a drinker by 8% in a sample of New Zealand teenagers and Gordon et al (2011) found that awareness of each marketing channel increased the odds of being a drinker by 11% in their study of Scottish teenagers.

6.2.2 Perceived social norms and alcohol consumption (Research Proposition 2)

Research Proposition 2 examined the role of different types of perceived norms on weekly drinking status. In common with a large number of prior studies, the analysis revealed that perceived frequency of drinking of close friends was the strongest normative predictor of personal frequency of *drinking to get drunk* (AOR = 127.14, p < 0.001) and that

perceived subjective norms of close friends were also a significant, albeit much smaller, predictor of personal consumption (AOR = 1.01, p < 0.01). A similar analysis of the role of norms in predicting personal *frequency of drinking* (conducted as part of Research Proposition 3) also confirmed the predominant role of perceived descriptive norms of close friends (AOR = 19.728, p < 0.001).

6.2.3 Perceived social norms as an indirect pathway for the influence of marketing on consumption (Research Proposition 3)

Research Proposition 3 examined the indirect association between alcohol marketing communications and drinking through the indirect pathway of perceived social norms. After testing a number of hypotheses, the data provided evidence to suggest that:

- the relationship between engagement with alcohol marketing communications and personal *frequency of drinking* is mediated by the perceived frequency of drinking of close friends

- the relationship between engagement with alcohol marketing communications and personal *frequency of drinking to get drunk* is mediated by *both* perceived frequency of drinking to get drunk by close friends and the perceived acceptability of drinking to get drunk amongst college peers.

An unplanned supplementary analysis suggested that perceived close friend descriptive norms for frequency of *drinking*, and *drinking to get drunk*, mediated the relationship between *engagement with alcohol marketing communications in online social media* and both personal *frequency of drinking* and *drinking to get drunk*.

Furthermore, this analysis suggests that the strength of the relationship between alcohol marketing and consumption increases as levels of consumer interaction with marketing increase. Out of the various marketing measures, mere exposure to alcohol marketing was the weakest predictor of personal consumption, whilst engagement with alcohol marketing in the social media space was the most powerful marketing predictor of consumption. This is likely to be because simultaneous interaction with brands and peers is fostered in this context. See Tables 37 and 38 for details.

6.3   Core contributions of Research Propositions 1, 2 and 3.

The major findings outlined above represent several new contributions to the literature.

6.3.1   Alcohol marketing in Ireland

Alcohol marketing in Ireland has not been studied in any depth, despite the ongoing public debate about alcohol related harm in Irish society. As such this study makes a new contribution to the academic and policy debate about alcohol marketing and its regulation in Ireland.

6.3.2   Cumulative impact of alcohol marketing

Despite a large number of consumer based studies on alcohol marketing in other countries, most prior work has focused solely on advertising, and relatively few studies have considered other aspects of the marketing mix in any depth (Brodmerkel and Carah, 2013; Jones and Jernigan, 2010). This study examines the cumulative impact of more than a dozen marketing channels. A unique feature is the inclusion of alcohol marketing in online social media, a new and increasingly significant marketing channel, which has either not been considered in previous studies of the cumulative impact of alcohol marketing (Gordon et al., 2011) or alternatively was considered in a less comprehensive manner (Lin et al., 2012). The extensive range of alcohol marketing communications channels is itself a specific contribution to the academic literature.

6.3.3 Alcohol marketing and binge drinking

While most prior consumer studies conducted in other countries have examined the influence of marketing on alcohol consumption *volumes*, it is believed that this is the first study that has investigated the relationship between alcohol marketing and the frequency of *drinking to get drunk*. This represents a new departure in alcohol marketing studies and suggests an association between marketing and deliberate, intentional binge drinking.

6.3.4 Social norms in Ireland

While numerous studies have considered the association between social norms and drinking behaviour, this has not been attempted previously in the Irish context. The Irish drinking culture differs from that in the United States where most prior social norms work has been conducted. Thus a consideration of the role of social norms in Ireland is itself a new contribution to the social norms literature.

6.3.5 Social norm salience

Research Proposition 2 also makes a contribution that is not merely geographic in nature. In general, prior studies have tended to conflate injunctive and subjective norms. By indicating that the perceived subjective norms of friends (a close reference group) may be more important than the perceived injunctive norms of college peers (a distant reference group), this study has confirmed the practical importance of reference group salience, a finding which has significant theoretical and policy implications for downstream social norms marketing efforts, both in Ireland and elsewhere.

6.3.6 Social norms weighted index

The use of a social norms weighted index is an important methodological contribution from this thesis. It appears that this is the first study which has combined social norms from different reference groups by using a weighted index which incorporates a measure of social distance and of norm salience. Given the overwhelming importance of norm salience both in prior literature and in this study, the use of a weighted index to take account of salience effects is essential for future researchers.

6.3.7 Marketing more strongly associated with consumption as levels of engagement and interaction increase

The delineation of the influence of alcohol marketing according to levels of interaction and engagement seems to be a unique contribution in the worldwide alcohol marketing literature, pushing the field further than it has heretofore been taken. See Tables 37 and 38 for more details.

This is especially important in a global policy context in which traditionally passive "above the line" alcohol advertising is under increased public scrutiny, alcohol marketers are motivated to transfer their resources into newer marketing channels, particularly in the digital and social media spheres. New digital marketing channels have, from the industry's perspective, the triple advantage of being largely below the radar of the general public and of regulators, being extremely difficult to regulate and of being extremely effective. This effectiveness arises because of the interaction that it fosters as well as the superior consumer targeting possibilities that it affords.

While the phenomenon of online alcohol marketing is new and remains broadly under-researched, nevertheless there are a number of studies that have addressed the issue in one form or other (Epstein, 2011; Gordon et al., 2011; Hartigan and Coe, 2012; Jones and Magee, 2011; National Center on Addiction and Substance Abuse, 2011; Pinsky et al., 2010; Tucker, Miles and D'Amico, 2013). In addition, a number of studies that have specifically examined the influence of user-generated pro-alcohol content on social media networks (Ridout, Campbell and Ellis, 2012; Moreno et al., 2012). Irrespective of the methods used, these studies have found an association between online alcohol advertising, or pro-alcohol user generated content, and personal consumption.

Two studies in particular have gone further than the others. De Bruijn (2012) found a significant dose-response relationship between exposure to online alcohol marketing and consumption across 4 European countries, controlling for exposure to traditional forms of alcohol marketing. Lin et al (2012) went even further, comparing the association between engagement with traditional alcohol marketing and drinking status with the influence of online alcohol marketing and drinking status. While *exposure* to traditional marketing channels increases the odds of being a drinker by 8% and *engagement* with traditional alcohol marketing channels increased the odds of being a drinker by 51%, *engagement with online marketing* was more strongly associated with drinking status, increasing the odds of drinking by 98%.

However, this thesis goes even further again by proposing a laddering effect which is outlined in Tables 37 and 38. The finding that engagement with alcohol marketing in

social media is more strongly associated with consumption than engagement with marketing online, which in turn is more powerfully related to consumption than engagement with marketing in general which in turn appears more powerful than mere exposure to marketing is an important new departure in the field of alcohol marketing studies and suggests an important role for interaction with marketing and with peers. It also helps to extend the debate about the relationship between alcohol marketing and consumption from *whether* such a relationship exists to *when* it exists or *when* it is at its most powerful. It also reinforces aspects of the Focus Theory of Normative Conduct (Cialdini et al., 1990) that suggests that norms become more powerful when made more salient, and that is exactly what happens when peer norms are highlighted and communicated in a social media environment (see section 2.3.2 for a discussion on this point).

The finding that alcohol marketing in the digital and social media environment is more strongly associated with alcohol consumption has significant policy implications which will be considered later.

6.3.8   Indirect influence of marketing

The suggestion that there may be an indirect influence of marketing on alcohol consumption via perceived descriptive and injunctive norms is the signature contribution of this thesis. The idea that alcohol marketing might influence social norms around drinking is not new. In recent years many researchers have argued that alcohol marketing normalises alcohol consumption and have used this argument in their cases for tighter

restrictions on alcohol marketing (Atkinson et al., 2011; Brodmerkel and Carah, 2013; Burton, Dadich and Soboleva, 2013; Dobson, 2012; Giesbrecht and Greenfield, 2008; Griffiths and Casswell, 2010; Leyshon, 2011; McCreanor et al. 2013; Nicholls, 2012; Ridout, Campbell and Ellis, 2012). *However, it appears that in every single instance the normalisation hypothesis has, to date, been assumed to be self-evident, apparently made without any specific empirical foundation or support. This thesis presents what appears to be the first empirical evidence that alcohol marketing might normalise alcohol consumption.* The possibility that norms may mediate the relationship between alcohol marketing and consumption makes an important contribution to the literature on alcohol marketing (and marketing theory in general) as well as that of social norms theory. It contributes to the ongoing extension of the alcohol marketing debate (Dobson, 2012) from the consideration of *whether* alcohol marketing is associated with consumption to *how* this occurs. It also informs the social norms literature by suggesting that marketing may be an important antecedent in the formation of normative perceptions.

In effect, this research undermines a counter-argument made with increasing frequency by the alcohol industry. Faced with mounting evidence from a growing list of studies showing that marketing encourages alcohol consumption, the industry has begun to argue that it is the influence of peers that is really of greatest importance, not commercial marketing practice (Alcohol Beverage Federation of Ireland, 2011; Laure, 2013). This is, of course, only partly correct as far as it goes. As already outlined in Chapter 2, there is a substantial evidence base testifying to the power of peers in influencing behaviour, especially through social norms. This is also replicated in this thesis – perceived close

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friend descriptive norms was by far the most powerful predictor of personal consumption. So it is correct to say that peer influence is important.

Crucially, however, peers do not exist in a cultural vacuum – they too are subject to commercial and media pressures and act accordingly. *It is a specious argument to maintain that alcohol marketing isn't worth worrying about compared to the influence of peer drinking when the behaviour of peers may partly be a function of marketing.*

But there is more. Individuals do not just make behavioural decisions based on the actual actions of peers; they respond to the *perceived* actions of their peers. The majority of individuals perceive that others drink, and approve of binge drinking, more than they themselves do. As a large body of research outlined in the literature review in Chapter 2 establishes, and as confirmed in Research Proposition 6 (see Appendix III), such perceptions are often erroneous.

As Research Proposition 3 suggests, these perceived norms may be actively nourished by exposure to, or engagement with, alcohol marketing communications. The more individuals were exposed to, or engaged with, alcohol marketing, the more likely they were to perceive greater drinking frequency or acceptability on the part of their friends, and this perception of greater drinking frequency or acceptability in turn predicted their own drinking behaviour.

While it appears that this is the only study to have examined the role of alcohol marketing via perceived norms in this way, there is a substantial body of empirical data under the

umbrella of cultivation theory (Gerbner, 1969) which supports the basic model on which these findings are based. The basic premise of cultivation theory is that the more television one is exposed to, the more likely one is to perceive the world in ways similar to the dominant themes reflected in television programming. There are in excess of 500 published papers (Morgan and Shanahan, 2010) across more than two dozen countries (Morgan, Shanahan and Signorielli, 2009) testing this theory. Links have been found between heavy television viewing and perceptions of the frequency of violence (Gerbner and Gross, 1976), perceptions of the extent of marital infidelity (Woo and Dominick, 2001), perceptions about ideal body size and shape (Kubic and Chory, 2007) and perceptions about sex roles (Ferris et al., 2007) to give just a few examples from this extensive body of work.

If general exposure to television programming, at best a rather passive exercise on the part of the viewer, can cultivate mistaken or potentially unhealthy views of reality, then it is obvious that marketing can do the same, *especially when consumers engage with marketing in an active manner and even more particularly when that interaction is intensified by the involvement of their peers in online social networks.* Far from being an influence that is independent of marketing, peers would seem to *perpetuate*, and indeed *magnify*, the influence of marketing on those around them.

This raises an interesting philosophical and practical question about the role of marketing and personal autonomy. A brief examination of two other social issues – freedom of speech and sexual autonomy – will initially illustrate the point.

If environmental forces, and particularly peers, strongly influence individual behaviours, then they can be said in some circumstances to more or less limit or constrain personal autonomy, particularly amongst those who are more or less vulnerable to such influence. An example of this can be found with spiral of silence theory (Noelle-Neumann, 1974), the basic premise of which is that when an opinion becomes very dominant within a group or within the wider society, those who hold the alternative viewpoint are reluctant to speak their mind, with the result that the dominant position becomes even more pervasive, and the alternative opinion becomes seemingly more marginalised. Thus a spiral of silence surrounds the minority opinion because, even though free speech is not legally proscribed, the fear of social disapproval inhibits the individual autonomy of freedom of speech.

Something similar can be seen with adolescent sexual initiation. Several studies have documented significant numbers of adolescents who regret early sexual initiation (Eshbaugh and Gute, 2008; Martino et al., 2009; Wight et al., 2008). External pressures often precede such sexual debuts, including the perception that peers have already have sex (Babalola, 2004; Osorio et al., 2012), sometimes leading adolescents, especially young women, to engage in unwanted sex (Houts, 2005). We are not dealing here with sexual assault or violence, but rather impaired personal autonomy originating from environmental, and especially peer, influences.

In the above examples the right to freedom of speech and to bodily integrity remain enshrined in law. However, the freedom to exercise such rights is constrained by environmental forces, including perceived norms, and individuals often feel compelled to

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comply with these perceived norms because of the perceived threat of social sanction associated with breaching peer norms (Bendor and Swistak, 2001).

Of course, not everybody follows the perceived majority norms - there are individuals who voice minority opinions or who can resist sexual advances for which they feel ill prepared, perhaps due to having stronger personal values or having a personality that is more resistant to social pressures (Adams, 1977; Bearden, Netemeyer and Teel, 1989) or for whom the mainstream or peer norm is not the most salient.

But there are certain circumstances that render individuals more prone to normative pressures, including social ambiguity, anxiety and a desire to fit in with others (Lapinski and Rimal, 2005; Neighbors et al., 2007a). These conditions are often experienced amongst adolescents and college students who are trying to establish their place in social networks. There is also evidence suggesting that alcohol marketing has a more powerful influence on precisely this category of young people (Casswell, Pledger and Pratap, 2002; Collins et al., 2007; Ellickson et al., 2005).

Thus, if marketing fosters permissive norms around drinking, and if norms can act in such a way as to limit personal autonomy, it could be argued that in some circumstances and for some individuals, marketing can contribute to limitations on their personal autonomy.

Despite the common argument that marketing creates choice by fostering and diffusing new innovations within society (Wilkie and Moore, 1999), and the fact that marketers do not actually physically *force* consumers to buy their products, the constraints on the

complete autonomy of consumers are nonetheless real, whether they are intended by marketers or not. For example, it is hard to reconcile the abstract argument that marketing creates choice with the reality of the testimony collected by Elliot and Leonard (2004) in their study of British 8-12 year olds from impoverished backgrounds. The children reported wanting to own expensive branded trainers, and outlined their vivid fear of wearing the cheapest unbranded ones, precisely because they would not be accepted by their peers, or even face bullying, if they did not have the best brands of trainers. It would appear that marketing, having been *perpetuated* and *magnified* by peer pressure, limited the choices of these children and their families.

In the case of the branded trainers above, the peer pressure exerted on teenagers would not appear to be intentionally harnessed by the industry in question. It is doubtful if the alcohol industry could be excused in the same way. The industry argument that alcohol marketing doesn't have to be regulated because it's really peers that are the problem lacks credibility when *the industry actively facilitates, and indeed recruits, individuals to act as online marketers and brand ambassadors with their own peers.*

There are has been a concerted shift by companies in all industries towards using social media sites for marketing purposes. The alcohol industry is no exception – there are suggestions that the industry has reduced their levels of content in traditionally static websites and transitioned towards social media platforms (Winpenny et al., 2012). In 2010, for example, Diageo announced that 21% of its marketing budget would be dedicated to digital marketing communications (Mosher, 2012), and in 2011 Diageo entered a marketing deal worth $10 million with Facebook in exchange for exclusive access to social

media consultancy and data services. Heineken has since followed suit with a similar arrangement (Jernigan and Rushman, 2013). The latest developments involve alcohol branded smartphone apps and websites that interact with social media profiles in order to encourage friends to have a drink, all of which is conducted through branded communications platforms. This communication is personal and mediated through friends, and the effects of marketing are perpetuated and magnified by peers who are actively encouraged and facilitated by technology designed by alcohol marketers. As the data in Research Proposition 3 suggests, such interactive communication, involving high levels of simultaneous engagement with both brands and peers is likely to be very potent. McCreanor and colleagues (2013: 112) succinctly summarise several reasons why such social media communication tools can have such an important attraction for, and influence on, young people:

"Firstly, they blur or remove boundaries between public/private spaces (Papacharissi 2009), private identity/public persona and user/consumer (Hearn 2008). Secondly, they are often seen as online extensions of face-to-face relationships (Williams 2008; Boyd and Ellison 2007). Thirdly, they are 'sticky'; that is, users visit them frequently (Hearn 2008; Rosen 2006), and fourthly, graphic images (photographs, video) are significant elements (Williams 2008) and continuously rejuvenated (Papacharissi 2009), functioning to visually privilege social connections and offline socialising (Livingstone 2008). Research suggests that young people 'are living life online and in public via these sites' (Subrahmanyam and Greenfield 2008, 417) and they are integral to identity, relationships and lifestyles (Livingstone 2008; Boyd 2007)."

A number of studies have conducted netnographic and content analyses of young people's engagements with alcohol marketing on social media sites in several countries

(Brodmerkel and Carah, 2013; Griffiths and Casswell, 2010; Nicholls, 2012; Winpenny, Marteau and Nolte, 2013), revealing the effectiveness of this strategic shift towards digital marketing by the alcohol industry. Young people extensively engage with alcohol marketing, sharing both paid marketing and user-generated pro-alcohol material within their online social networks. As Griffiths and Casswell (2010) argue, the pervasive nature of alcohol related communications online have created an intoxigenic environment that normalises consumption.

As discussed in Research Proposition 3, the association between alcohol marketing communications and alcohol consumption seems to strengthen as the consumer engages more actively with marketing, with the association reaching its most intense level in social media environments in which the consumer interacts with both the marketing message and with peers. Given the pressure so many experience to fit in due to the social anxiety that is natural to adolescent and early college years, and given the predominant influence of perceived peer norms on behaviour, it appears that the confluence of marketing and normative pressures could paradoxically serve to limit the freedom of choice of vulnerable young people.

6.4   Practical and policy implications

There are several important practical implications suggested by this study, and they may be categorised in terms of downstream and upstream applications.

6.4.1   Downstream policy applications

Goldberg (1995) has classified social marketing initiatives as being either upstream or downstream in nature. Downstream social marketing is aimed at rescuing individuals who have, so to speak, already fallen into the river. They are individuals whose behaviours may be unhealthy or otherwise problematic. They can be helped to get out of the river either individually or collectively.

The obvious downstream implication that arises relates to the use of the social norms marketing approach to change behaviour in Ireland (and more specifically, in the Dublin Institute of Technology). As previously outlined in section 2.4.2, a substantial body of work (primarily in, but not limited to, universities in the United States) has shown that correcting social norm misperceptions appears to be a powerful downstream change agent, bringing about downward shifts in student drinking behaviour. The basic pre-requisite for a successful social norms campaign is that peer norms must be misperceived. The data analysis in Research Proposition 6 (see Appendix III) shows that the first test has been satisfied – there is a clear pattern of misperceived descriptive and injunctive norms within the DIT student population.

The second basic requirement for a successful social norms intervention campaign is that the misperceived norms relate to a salient reference group. The analysis in Research Proposition 2 suggests that DIT peer norms are not the most salient norm for DIT students – when perceived norms of close friends were included in the analysis, the relationship between DIT norms and personal drinking behaviour was not significant. This suggests that a social norms marketing campaign would not be successful within the Dublin Institute of Technology.

In this regard, it is worth recalling that the living arrangements for students of the Dublin Institute of Technology are the equivalent of those for students in a commuter college in the United States. The DIT has no central student accommodation and has no unified campus - it is spread out across more than thirty buildings across Dublin city. Perhaps more significantly, many of the students are from the wider Dublin region and still live at home – 68% of respondents in this study still lived with their parents. This contrasts sharply with large North American college campuses some of which are like self-contained towns with extensive on-campus accommodation which naturally tends to result in closer ties with other students and a greater identification with them.

This finding coincides with prior research on norm salience in college campuses (Baer, Stacey and Larimer, 1991; Mallett, Bachrach and Turrisi, 2009; Thombs, Wolcott and Farkash, 1997) and strongly suggests that a college-wide social norms marketing intervention would not work within the Dublin Institute of Technology because the average DIT student is not an important reference group against which DIT students measure their alcohol consumption. Effective campus-wide social norms interventions

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require a relatively homogenous college campus (Yanovitzky, Stewart and Lederman, 2006); such conditions are not met within the Dublin Institute of Technology.

However, the research does not entirely close the door on the application of social norms marketing interventions in Ireland. While the study design only allowed actual misperceptions to be discerned in relation to the average DIT student, there were large self-other discrepancies between the consumption of respondents and the perceived consumption of all reference groups, including that of close friends, which was the most salient one of all. While it is not certain that such *self-other discrepancies* also imply the existence of *misperceptions,* it seems probable that they would (Baer, Stacey and Larimer, 1991; Carter and Kahnweiler, 2000; Larimer et al., 2011; Lee et al., 2007; McAlaney and McMahon, 2007; Yanovitzky, Stewart and Lederman, 2006).

At a practical level it is difficult to implement a social norms marketing campaign when the college norm is not the most salient one for students. It would be exceedingly difficult to calculate perceived norms for "close friends" when the identity of that reference group differs from student to student, and such an approach could only work with relatively small, homogenous social networks. Indeed, a significant credibility barrier has to be overcome when using close friends as the key normative reference group – young people might well believe that they know more about their close friends' drinking behaviours and attitudes than the (older and unknown) social norms marketer does.

Moreira, Smith and Foxcroft (2009), in a systematic review of social norms interventions, found that web based and individual face to face social norms interventions were more

effective than traditional campus-wide social norms marketing interventions. Both the web-based and face to face nature of the interaction allows for more easily customisable feedback based on the actual norm of the social network in question.

An alternative approach is to initiate social norms interventions at an earlier age when habits are being formed. While close friends are the most significant reference group in this study, it is not clear where those close friends come from. For some, close friends may certainly be other college peers, but for others they will be friends that they grew up with, including school friends. As Balvig and Holmberg (2011) illustrate in a study of Danish school children, social norms interventions can be effective in bringing about positive behaviour change, even with 12-13 year olds.

It may also be the case that social norms interventions could be feasible in other Irish universities in which college peers are a salient normative reference group for students. This is more likely to occur in those institutions which are situated on a unified campus and which offer on-campus student accommodation. More research is needed on this in the Irish context.

6.4.2   Upstream policy applications

If downstream social marketing initiatives are aimed at rescuing those who have fallen into the river, upstream approaches are aimed at preventing people from falling into it in the first instance. When it comes to the question of alcohol consumption, a stroll upstream reveals a vast array of promotional efforts encouraging people, especially the young, to

jump right into the river. Prevention, as they say, is better than cure; so too upstream social marketing initiatives hold out greater potential than downstream approaches do.

The major upstream policy application of this thesis relates to the debate about the regulation of alcohol marketing.

This thesis helps to strengthen the argument for an outright ban on paid promotional messages by the alcohol industry. The data suggests that engagement with alcohol marketing communications is associated with both drinking and drinking to get drunk – an extreme form of premeditated binge drinking. This effect may well be independent of the actual content of promotional messages – it is exposure to, and the level of engagement with, promotional messages that has such an effect. Furthermore, the data also supports the contention that at least some of the peer pressure that young people experience to drink alcohol is itself associated with paid marketing activity. In this sense, peers are perpetuators and magnifiers of the influence of alcohol marketing. While alcohol marketing is not the only cause of alcohol related harm, it remains an important part of the picture, and removing alcohol marketing from that picture is an important part of the solution.

However, in some countries, including Ireland, is not completely politically feasible. Indeed, given the changing nature of communications technologies, it may also not be practical in the absence of a global agreement on this matter. As an interim step, as part of an incremental and pragmatic approach (University of Stirling, 2013), there are a number

of regulatory measures that can be introduced to lessen young people's levels of exposure to, and engagement with, alcohol marketing communications.

Proposals for regulating traditional marketing channels

Audience profile thresholds currently in place in Ireland and the UK need urgent review. For example, in the original 2005 Irish voluntary codes, a minimum of 67% of the audience watching a programme had to be above 18 (Department of Health and Children, 2005). Following a review in 2008, this was increased to 75% (Department of Health and Children, 2008). This is still far too low.

According to the 2011 Census of Ireland, 25.03% of the population are under 18 years of age (Central Statistics Office, 2012). Therefore, theoretically, if every person in the country watched a television programme, it would be acceptable to advertise alcohol around that programme *even if every single child in the country could see it.* A programme where 25% of the audience are under 18 is not an adult oriented programme – it is by definition a programme that appeals to all viewers.

In practice, however, the situation is even worse. The 25.03% of the population who are under 18 includes *all* children, including newborns. Because newborns and very young toddlers would not (normally) watch television, allowing 25% of the viewership to be under 18 will actually disproportionately target those under 18 years old who watch television.

Further, the average Irish adolescent starts to experiment with alcohol at 13 years of age (Palmer and O'Reilly, 2008), making those aged a few years on either side of this (from 10 to 17 years of age) the key population of greatest concern in relation to underage alcohol marketing. It is these adolescents from about 10 to 17 years of age who are the ones who are more likely to watch the "adult" programmes around which alcohol is marketed, and there is evidence that they may be more susceptible to alcohol marketing than older consumers (Caswell, Pledger and Pratap, 2002; Collins et al., 2007; Ellickson et al., 2005). According to the Census of Ireland, only 10.27% of the Irish population are between 10 and 17 years of age. A regulatory system which sets a target threshold of 75% for over 18 year olds is, by definition, one which almost certainly allows a disproportionate number of this vulnerable teenaged demographic to be exposed to alcohol advertising. At a bare minimum, at least 90% of the target audience of programmes on television, and movies in cinemas, should be above 18 years of age in order to avoid the potential disproportionate exposure of young people to alcohol advertising. While such a measure is likely to encounter significant opposition from the alcohol industry, it must be borne in mind that such a proposal does not in fact even protect all vulnerable teenagers. In reality, it is the bare minimum that should to be expected in terms of shielding vulnerable teenagers from paid audio-visual alcohol promotion.

An outright ban on outdoor alcohol advertising is also worthy of consideration. Outdoor advertising is visible to everyone – it is not possible to protect underage drinkers from these ads, although the principle behind the current Irish ban on outdoor alcohol advertising within 100m of schools is a worthwhile, but still insufficient, attempt at addressing this issue. The ubiquity of alcohol advertising on our streets, irrespective of

their content, sends an important message about the acceptability of alcohol consumption. Because it is not possible to protect younger people from exposure to outdoor alcohol advertising, there is a strong argument for banning it.

The *Health First* evidence-based alcohol strategy in the UK also argues that advertising content restrictions should move away from what marketers can't say to defining what they *can* say (University of Stirling, 2013). There is much merit in this recommendation, especially with respect to prohibiting sociability and other appeals that explicitly harness normative influences.

Proposals for regulating online alcohol marketing

The shift towards digital marketing and has been rapid, and online marketing is likely to grow in importance. Across the EU, 89% of 16-24 year olds go online; 70% visit social networking sites daily, and the average 16-24 year old spends 19.2 hours per week online, all much higher figures than older generations (MediaScope Europe, 2013).

Mandatory age authentication controls are absolutely essential for all alcohol related websites, particularly for social networking sites. Such age authentication controls must involve some objective measure of age.

As things stand, anyone can lie about their age on alcohol websites, and there is evidence that such deception is widespread on the part of young teenagers (O'Neill, Grehan and Ōlafsson, 2011). Indeed, websites that do not place cookies on users PCs allow them to change their age *even after being denied access* the first time around.

There are companies that specialise in providing technologically robust age authentication services to gambling, tobacco and pornographic websites in the United States. Typically they necessitate supplying a credit card number, or some other form of identification, which is then checked to ensure that the person is over 18 years of age. While it is true that even such "objective" age verification systems are still not 100% foolproof, they do provide significantly enhanced protection compared to the current system. Very few protections are 100% foolproof in any area of life, but the fact that we cannot protect all children all of the time is not a reason not to attempt to protect most children most of the time.

Furthermore, marketers should be required to act with complete transparency in relation to their digital marketing activities. Marketing communications in traditional media channels are much easier to monitor than in digital channels. Because of the difficulty in monitoring them, online alcohol marketers should be required to provide a complete inventory of their online marketing activities on a regular (for example, monthly or quarterly) basis. The information gathered would help regulators monitor this area and would help inform future digital marketing policies. This is especially important given the very dynamic nature of online marketing – innovative new channels can develop very suddenly, making the job of regulation that much more difficult. A regular update of digital communications would allow regulators to stay informed about new developments in the field.

Addressing the issue of *user generated content* is also necessary. Often such material is explicit in its glorification of binge drinking. It can be found on private social networking pages and hence is not even subject to the content or primitive age authentication measures in place on branded websites (Winpenny et al., 2012). While it is seemingly difficult to police privately published user generated content that promotes binge drinking, it can be removed from any social networking accounts officially associated with alcohol brands. As Jernigan and Rushman (2013) point out, problematic user generated content is not regularly removed from official alcohol branded websites. All future co-regulatory codes or legislation should automatically apply to user-generated material submitted to alcohol branded social media sites – alcohol marketers should have an explicit obligation to police such sites and to remove material that breaches the codes.

Finally, "heritage advertising" has been placed outside of the remit of the Advertising Standards Authority of Ireland's Code of Standards for Advertising, Promotional and Direct Marketing in Ireland (Advertising Standards Authority for Ireland, 2007). The code does not apply to:

"heritage advertising, where that advertising is not part of the advertisers' current promotional strategy and is published in an appropriate context."

The growth of online and social media communications renders this provision especially important. It is easy to imagine how old advertisements that blatantly breach existing content regulations could be placed online by alcohol companies in an "educational" or other context and go viral as a result. Given the evidence that nostalgia advertising is extremely effective marketing tool (Merchant and Rose, 2013), this anomalous provision of the Irish advertising codes should be reconsidered.

The special case of sponsorship of sporting events by alcohol brands

The sponsorship of sporting events by alcohol brands requires special consideration, particularly in the Irish context. In 2012, a Steering Group of public health experts and stakeholders, including trade and industry representatives, proposed a number of measures to reduce alcohol related harm in Ireland (Department of Health and Children, 2012). Amongst the measures proposed by the Steering Group was a ban on the sponsorship of sporting and cultural events by the alcohol industry, though not without dissent from industry representatives who argued that there was no definitive proven link between sports sponsorship and alcohol misuse (Alcohol Beverage Federation of Ireland, 2011).

While most prior work has focussed on traditional advertising, there are some studies which specifically examine sports sponsorship and suggest a link with alcohol consumption (Davies, 2009; Jones, Phillipson and Barrie, 2009; O'Brien and Kypri, 2008; O'Brien et al., 2011). However, it would appear that the alcohol industry is not entirely incorrect when it argues that there is no definitive proven link between sports sponsorship and alcohol misuse, precisely because such narrowly focused research appears to be practically impossible to conduct in any realistic or meaningful way.

To establish the definitive causal link between sports sponsorship and alcohol consumption or misuse that the alcohol industry refers to, it would be necessary to measure exposure to alcohol sports sponsorship over time, *while controlling for the influence of all other forms of marketing communications*. But effective and well executed marketing is

tightly integrated across multiple mutually reinforcing channels of communication (Kliatchko, 2005). What this means is that sports sponsorship is not an entirely stand-alone form of communication and persuasion but rather is tightly connected with other elements of the marketing mix. Thus, examining sponsorship in isolation from other marketing communications channels risks presenting a false picture which may not capture the more sophisticated real world effects of sports sponsorship.

A more realistic, and arguably the best, way to address these issues is by measuring the cumulative impact of exposure to alcohol marketing communications across multiple channels. This is the approach adopted in this thesis and in some other recent studies (e.g. Gordon et al., 2011). What such cumulative studies show is that each extra form of alcohol marketing, *including sponsorship*, that young people are exposed to is associated with an increase in the odds of drinking (and in this thesis, of binge drinking). Furthermore, this thesis illustrates that each type of marketing channel helps to normalise consumption. While it hasn't been specifically tested in the data due to the methodological complexities outlined above, it would appear logical that for some demographic segments, the normalising influence of sports sponsorship may be greater than that of other forms of marketing precisely because of the levels of affinity and engagement fans can have with their chosen sport, all of which is in turn perpetuated and magnified by the peers they interact with through the sport as well as by the branded merchandise that accompanies this. All of this is likely to render the pro-drinking norm more salient, and consequently more powerful (Cialdini et al., 1990), thus enhancing the power of the sponsorship message.

The role of sponsorship in the cumulative impact of marketing on consumption, and in particular its normalising influence, provide sufficient evidence to justify a complete ban on the sponsorship of sports and other social events. Such a development is politically feasible in Ireland.

6.4.3 Commercial marketing implications

Finally, it is worth mentioning in passing that the practical implications of this thesis are not limited to critical marketing or public health concerns. There are potentially important marketing implications for all industries in the conventional commercial marketing sphere, particularly in relation to diffusion of innovations (Kincaid, 2004; Rogers, 2003) and the use of opinion leaders in marketing communications (Chaney, 2001; Iyengar, Van den Bulte and Valente, 2011; Li and Du, 2011). However, because the central focus of this research is not concerned with commercial marketing practice, but rather with public policy and health related behaviours, these implications are merely noted without further elaboration.

6.5   Limitations of this study

As with all social science research, especially when conducted without funding, there are certain limitations that must be acknowledged.

6.5.1   Cross-sectional design

In the first instance it must be remembered that the study is cross-sectional in nature and does not establish causality. The direction of causality is especially important when considering models that test indirect effects. Mediation is essentially causal in nature, and it tries to establish a causal pathway between variables. While some purists argue that mediation tests are inappropriate for cross-sectional studies (Cole and Maxwell, 2003), the reality is that a very large number of valuable cross-sectional mediation studies are published every year. As Iacobucci (2008) argues, the creation of knowledge would be severely hampered if one always had to wait for absolutely ideal research conditions.

Indeed, while it is strictly correct that causality cannot be established for the models under investigation, in some instances an alternative reverse causality explanation seems conceptually implausible. For instance, Research Proposition 4 (Appendix III) argues that engagement with marketing is associated with increased negative attitudes towards non-drinkers. While a reverse causality explanation is possible – that negative attitudes towards non-drinkers encourage greater engagement with marketing - it is not as theoretically plausible as the proposition that it is engagement with marketing that fosters the negative attitudes towards non-drinkers. Reverse causality explanations become even

less conceptually credible when extended into some of the more complex mediation models. For example, Research Proposition 8 (Appendix III) suggests that overestimated norms for the acceptability of drinking to get drunk may mediate the relationship between engagement with marketing and negative attitudes towards non-drinkers. The simple explanation that marketing encourages us to consider certain behaviours as being more acceptable than they actually are, and that this in turn influences our attitudes towards those who don't engage in that behaviour, appears to be more plausible than a reverse causal explanation whereby those who hold negative attitudes towards non-drinkers overestimate the acceptability of certain drinking behaviours, and that this overestimation encourages them to actively engage with alcohol marketing.

Nonetheless, the cross-sectional sectional nature of the research does not allow causality to be established and this remains a limitation, albeit one that can be rectified with future research.

6.5.2   Mutually inconsistent answers

As outlined in Chapter 4, initial screening of the data revealed 153 respondents who gave logically impossible or mutually inconsistent answers to one or more question pairs, necessitating their removal from the dataset. While this problem could arise with any form of data collection, the anonymity of online surveys would appear to render them slightly more prone to careless or vexatious survey completion of this nature. Everything possible was done to ensure that problematic responses were removed, but to the extent that this cannot be guaranteed with 100% certainty, there remains a certain limitation

within the study. Having said that, a similar limitation attaches to all data collection techniques, whether quantitative or qualitative. Given the steps that have been taken to screen the data, the issue of mutually inconsistent answers should not give undue concern.

6.5.3   Low response rate

There was a response rate of 9.5% to the online survey. As outlined in section 4.4, there are several possible reasons for this relatively low response rate, including student apathy and fatigue with survey requests and a lack of engagement with their college email accounts which was the primary point of contact for the survey. While the response rate seems low on the face of it, other online surveys in Ireland on student alcohol consumption have also recorded response rates below 20% (Delaney, Harmon and Wall, 2008). Furthermore, the final sample of more than 1,000 students was reasonably representative of the student body as a whole and the sample size provided sufficient statistical power for any analysis that was needed.

6.5.4   Measurement issues

The phrasing, and number, of questions presents an almost inevitable limitation in survey research. This limitation is particularly acute when using online surveys due to the inevitable trade-offs that exist in terms of the level of detail that can reasonably be expected of online survey respondents. While a large number of potential confounding factors were incorporated into the analytical models, there may be other unmeasured – or unmeasurable – factors that may have confounded the relationships under investigation.

Furthermore, despite using a large number of previously validated questions and scales, several questions were developed or adapted specifically for this research, some of which utilised entirely new categories or concepts.

Measuring exposure to, or engagement with, marketing

In the first instance, the difficulty of accurately recording exposure to, or engagement with, marketing needs to be acknowledged. Measuring consumer relationships with marketing is notoriously challenging. A number of approaches are available, including memory-based or opportunity-based approaches, as well as techniques that ask respondents to record their interaction with different forms of marketing communications in diaries. Arguably the best approach would involve data triangulation by harnessing two, or even all three, measurement strategies. However this strategy is prohibitive in terms of cost and also has potentially significant implications in terms of sample size – it would be challenging to gather detailed daily marketing diaries from more than 1,000 students, for example. While the measurement strategy used in this research is entirely defendable, particularly in the context of an online data collection approach, the use of a memory-based approach on its own is a small limitation.

Measuring communication about drinking

A more challenging measurement issue relates to Question 17 which was designed to measure frequency of communication with peers about drinking. The purpose of this question was to control for peer interaction about drinking when assessing the relationship between marketing and perceived norms. It seems possible that

communication about drinking could be a vehicle for norm transmission which should be controlled for in any analysis of the antecedents of perceived norm formation. However, prior to substantive analysis of the data it became apparent that the wording of Question 17 was inappropriate for this study. The main drinking behaviour variables ask about the *frequency* of drinking or drinking to get drunk. Question 17 also asked about the *frequency* of communication with peers about drinking alcohol, including planning nights out and discussing what happened on a night out. However, unless respondents were solitary drinkers, each drinking occasion - or at the very least, each *social* drinking occasion – necessitates communication with friends to agree on venues, times and other meeting arrangements. As such, the *frequency* of communication about drinking should more or less be the same as the *frequency* of drinking (or at least of social drinking) thus rendering Question 17 inappropriate for this particular study.

In retrospect, it seems that designing *any* question to measure peer communication about drinking is likely to be very problematic. The challenge lies in disentangling communication about *drinking* from marketing itself. Online interaction is now a dominant form of communication, especially amongst younger people (Jernigan and Rushman, 2013). Arrangement for nights out are made online, and "post mortems" of the night out are discussed in social media, along with the sharing of photos from the night out. The measurement challenge derives from the increasing colonisation of the social media environment by alcohol brands. For example, several smartphone apps (for example, the *Guinnessplus* iPhone app launched in the autumn of 2013) now exist that allow users to interact with friends via branded email or social media plug-ins integrated within the app itself. Similarly, the Irish Licensed Vintners Association has developed a

website (www.getoutmore.ie) aimed at encouraging users to invite their friends out for a drink in their local pub. The website offers financial incentives to those who send such an invitation via the communications tools embedded within the website. Such commercial and technological developments present a significant research challenge – how does one isolate communication about *drinking* from communication about *marketing* in such an environment? Thus, while the wording of Question 17 made it inappropriate to control for communication about drinking within this study, technical developments within the social media sphere may make measuring communication about drinking extremely difficult, if not impossible, in any future study.

<u>The use of categorical variables</u>

A final measurement limitation relates to the use of categorical variables. The nature and distribution of responses to the questions on personal and perceived alcohol consumption (Questions 14 and 15) necessitated dichotomising the outcome variable, and in turn required the use of logistic regression analysis. While logistic regression has certain advantages for policy-oriented research in terms of both interpreting and communicating results, it does entail a loss of some information, and as such the dichotomisation is something of a limitation. The use of logistic regression for some of the mediation analysis also necessitated employing the $Z_{Mediation}$ score to measure the indirect effect (Iacobucci, 2012), instead of the more flexible resampling with bootstrapping approach (Bollen and Stine, 1990). The Iacobucci method, which is based on the logic of the original Baron and Kenny (1986) regression steps and the Sobel test (Sobel, 1982) is somewhat more conservative than the bootstrapping method (MacKinnon, Warsi, & Dwyer, 1995). As

such, the forced dichotomisation of response options is most unlikely to have resulted in

an overestimation of indirect effects, meaning that Type 1 errors should not be a concern.

6.6   Future research directions

The core findings and contributions of this thesis set the stage for a long term, extensive and exciting research agenda.

6.6.1   Establishing causality

The obvious avenue for future research is to establish causality between the main independent variables, the mediators and the behavioural outcome variables in the mediation models analysed in this thesis. Experimental techniques are the gold standard approach to establishing causal relationships in many fields of study. However, as discussed in section 1.4.2, an experimental approach would be inappropriate for this topic for both practical and ethical reasons – experiments do not take into account any conditioning by prior engagement with marketing, and deliberately exposing people to alcohol advertising poses certain ethical challenges (Anderson et al, 2009).

Given the inappropriateness of experiments, causality could be established by means of longitudinal studies which seek to establish that the cause (marketing) precedes the effect (normative perceptions and alcohol consumption). Temporal precedence of this nature has been accepted as integral to establishing causality for almost three centuries (Hume, 1739) and is standard in many epidemiological studies (Rothman and Greenland, 1998).

When examining mediation models like those presented in this thesis, there is a choice between what are known as "half-longitudinal" approaches (Cole and Maxwell, 2003) and

fully longitudinal approaches. Half-longitudinal approaches collect data in two waves – either the independent variable on its own, followed by contemporaneous collection of the mediator and the outcome variable, or else contemporaneous collection of the independent and mediating variables followed by the outcome variable. Cole and Maxwell (2003) propose statistical techniques to ameliorate the deficiencies of the half-longitudinal approach, but recommend a fully longitudinal data collection technique which would ideally collect data in three waves (one each for the independent, mediating and outcome variables) as a superior solution for estimating mediation with cohort studies.

Longitudinal studies are not without their own methodological and measurement challenges (Wunsch, Russo and Mouchart, 2010). However, given the inappropriateness of experimental data collection for marketing in general and alcohol studies in particular, and the ability of longitudinal techniques to assess temporal precedence, they remain the best approach to establish causality in this field.

As discussed in section 3.4, the restrictions imposed on the researcher by the DIT Research Ethics Committee meant that a longitudinal data collection approach would have been impossible within the DIT for this study. The ethics concerns related to a lecturer potentially having access to personally identifying, sensitive information relating to the personal behaviour of students. Longitudinal research could potentially be conducted within the DIT if there was a larger research team with researchers from outside the DIT, or indeed if the research was conducted in other settings which did not raise the same privacy concerns.

6.6.2 Improving survey measures

Many measures used in this research were based on previously validated questions and all measures were subjected to two separate stages of pilot testing prior to the launch of the online survey. Nonetheless, there always remains room for improvement. In particular, future studies could build on the marketing measures employed by also incorporating marketing diaries or opportunity-based measures of marketing exposure in order to attempt some data triangulation.

It would also be helpful to find a way to measure peer communication about drinking in order to be able to control for alternative environmental antecedents of norm formation. However, as discussed in section 6.5.4, the proliferation of branded communications in the social media arena makes devising an appropriate control measure extremely challenging if not impossible.

6.6.3 Investigating moderating effects

One of the unexpected findings of the research was the lack of certain moderating effects in the data. It was expected that exposure to, or engagement with, marketing and communication about marketing would interact in such a way as to make drinking or drinking to get drunk more likely. However, as discussed in Research Proposition 1, no statistically significant interaction effect was found. Similarly, susceptibility to normative influence was expected to moderate the relationship between perceived social norms and drinking behaviour. However there was no evidence of moderation in the analysis. It

appears that other researchers have not investigated these interaction effects. This is surprising, as interactions would be expected on purely conceptual grounds. Further research to investigate these potential interaction effects would be beneficial. The issue is not merely theoretical – uncovering interaction effects in either of these sets of relationships could have significant practical and policy consequences.

6.6.4   Investigating interactivity with marketing and with peers

One of the unanticipated findings of this research was that the association between marketing and consumption strengthened as levels of interaction between the respondents and both the brand and peers increased. This suggests that the confluence of simultaneous brand and peer engagement makes social media marketing particularly influential. Significant work remains to be done to investigate this finding in the context of the growing digital alcohol marketing field.

6.6.5   Extending the findings beyond the DIT, beyond students and beyond Ireland

In addition to a number of remedial measures that address the limitations of the present study, there is an almost vast arena in which the central findings of this study can be tested and extended. Obvious work remains to be done to address the issue of generalisability, particularly by trying to replicate the core findings in institutions other than the DIT, with non-student samples and with populations outside of Ireland.

6.6.6 Extending the findings beyond the context of alcohol

The consumption of alcohol is not the only type of product which is amenable to the influence of normative perceptions. There is fruitful work for critical marketers to apply the central marketing-norms-behaviour mediation model beyond the context of alcohol and into other product and behaviour categories. One obvious example is that of smoking. While there is significant work on the relationship between tobacco marketing and smoking initiation, the use of normative perceptions as a possible explanatory pathway for the marketing-smoking relationship may prove fruitful in that field. Similar applications of the normative mediation model may be readily imagined in practically all areas of concern for contemporary critical marketers, including food advertising and obesity (McClure et al., 2013), marketing and body image (López-Guimerà et al., 2010) as well as marketing and materialistic values (Srikant, 2013), amongst others.

6.6.7 Extending the findings beyond the context of marketing

Conceptually, the notion that norms mediate the influence of marketing is extremely adaptable, and there seems to be no reason why it should be limited only to the realm of marketing. There are other cultural environmental influences that may also have an indirect influence on behaviour via perceived norms. Mass media influence springs immediately to mind. As noted previously, much work has been done in this field, particularly in terms of cultivation theory (Gerbner, 1969). However, considering the role of perceived norms as an indirect pathway for the influence of media on human behaviour and attitudes may move that field beyond looking at *whether* media influences behaviour to examining *how* this comes about. Several areas for fruitful research come to mind. One

area that may prove very interesting is that of online pornography. Recent years have seen a legal and public health debate in the United Kingdom about regulation of online pornography due to its presumed impact on adolescent sexual behaviours and attitudes (Attwood and Walters, 2013). Considering whether perceived injunctive and descriptive sexual norms are an indirect pathway for the influence of online pornography on the sexual behaviours of adolescents seems to be a practically important extension of the model presented in this research. Other equally interesting applications in media research may be readily imagined, including, but not limited to, spiral of silence theory (Noelle-Neumann, 1974) and news agenda framing and media bias research (Scheufele and Tewksbury, 2006).

6.6.8 Supplementary statistical analysis

In addition to the new research projects outlined above, it is possible to conduct supplementary analyses on the existing data in order to drill into it in more detail. Extra analysis of this nature was not included in this thesis because it was beyond the scope of the specific research questions under investigation. However, there is a substantial body of data available for further detailed analysis at a later date.

One particular avenue that might yield new contributions to the field is to analyse the data on misperceptions in more detail by segmenting the sample according to individual alcohol consumption patterns. This approach could yield insights into the different types of normative misperceptions (Berkowitz, 2004). It may be the case that some respondents – those in the heaviest drinking categories - misperceive because of a process of false

consensus, whereby they are motivated to perceive that others drink in similar patterns to themselves in order to justify their own drinking behaviour.

Figures and Tables

Table 1: Median scores for personal drinking behaviour and beliefs and perceived DIT behaviour and beliefs for male and female students and for overall sample.

|	Male Students	Female Students	Overall
Perceived frequency of drinking	1.5	1.5	1.5
Perceived frequency of drinking to get drunk	1.5	1.5	1.5
Personal frequency of drinking	1.5	0.625	1.5
Perceived frequency of drinking to get drunk	0.625	0.625	0.625
Perceived approval of drinking to get drunk at weekends	6	6	6
Perceived approval of drinking to get drunk on weekdays	5	5	5
Personal approval of drinking to get drunk at weekends	5	5	5
Personal approval of drinking to get drunk on weekdays	4	4	4

Figure 1: Breakdown of sample by age
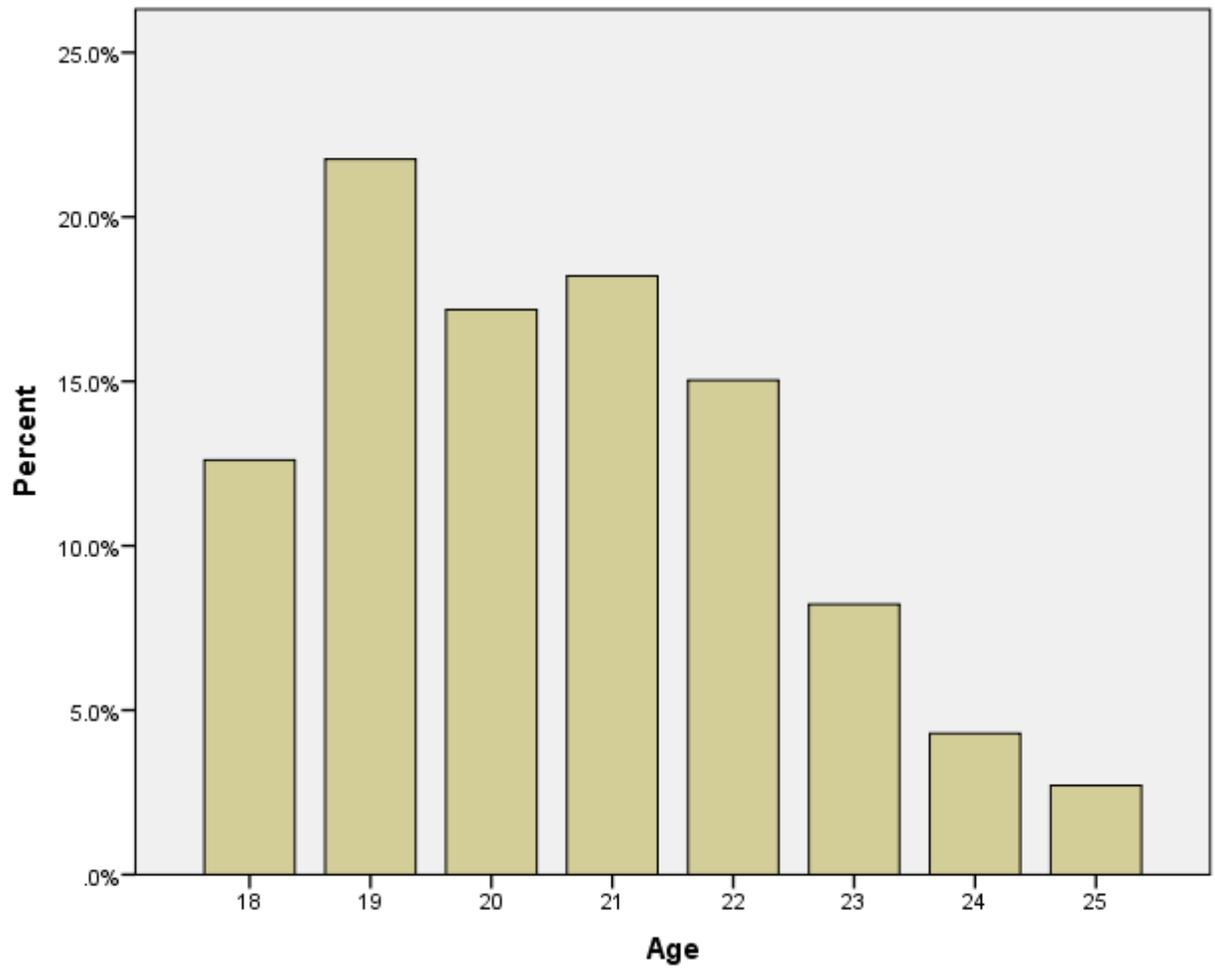
**Figure 2: Breakdown of sample by age of first drink**
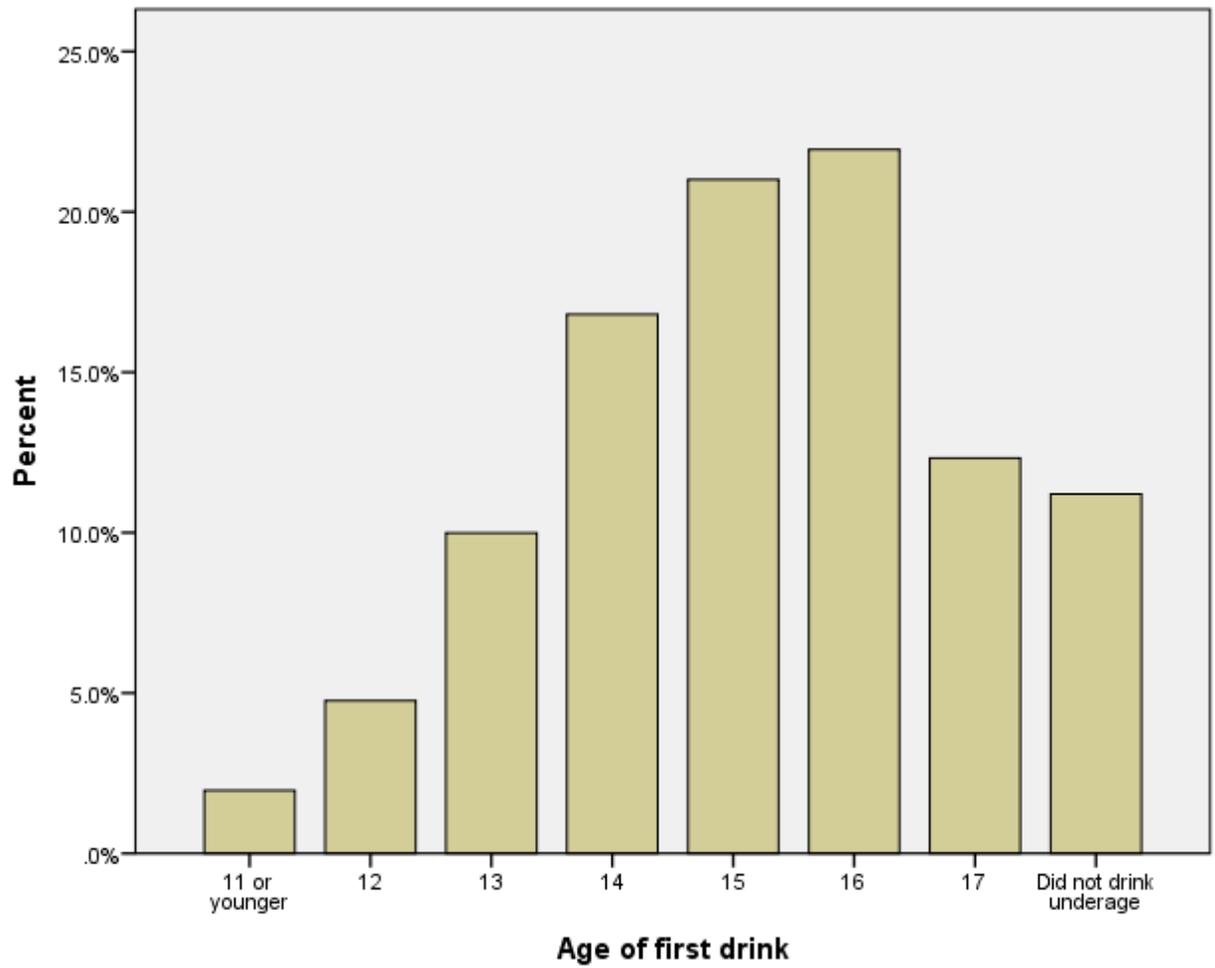
Table 2 Ethnicity

Ethnic background	Number	Percentage
Irish	952	88.9
Irish traveller	2	0.2
Any other white background	65	6.1
African	11	1.0
Chinese	6	0.6
Any other Asian background	14	1.3
Other	21	2.0

Table 3 Discretionary income

Amount	Number	Percentage
€20 or less	224	20.9
€21-40	365	34.1
€41-60	224	20.9
€61-80	112	10.5
€81-100	71	6.6
€101-120	29	2.7
€121-140	12	1.1
€140+	34	3.2

**Figure 3 Do religious beliefs influence your decisions?**
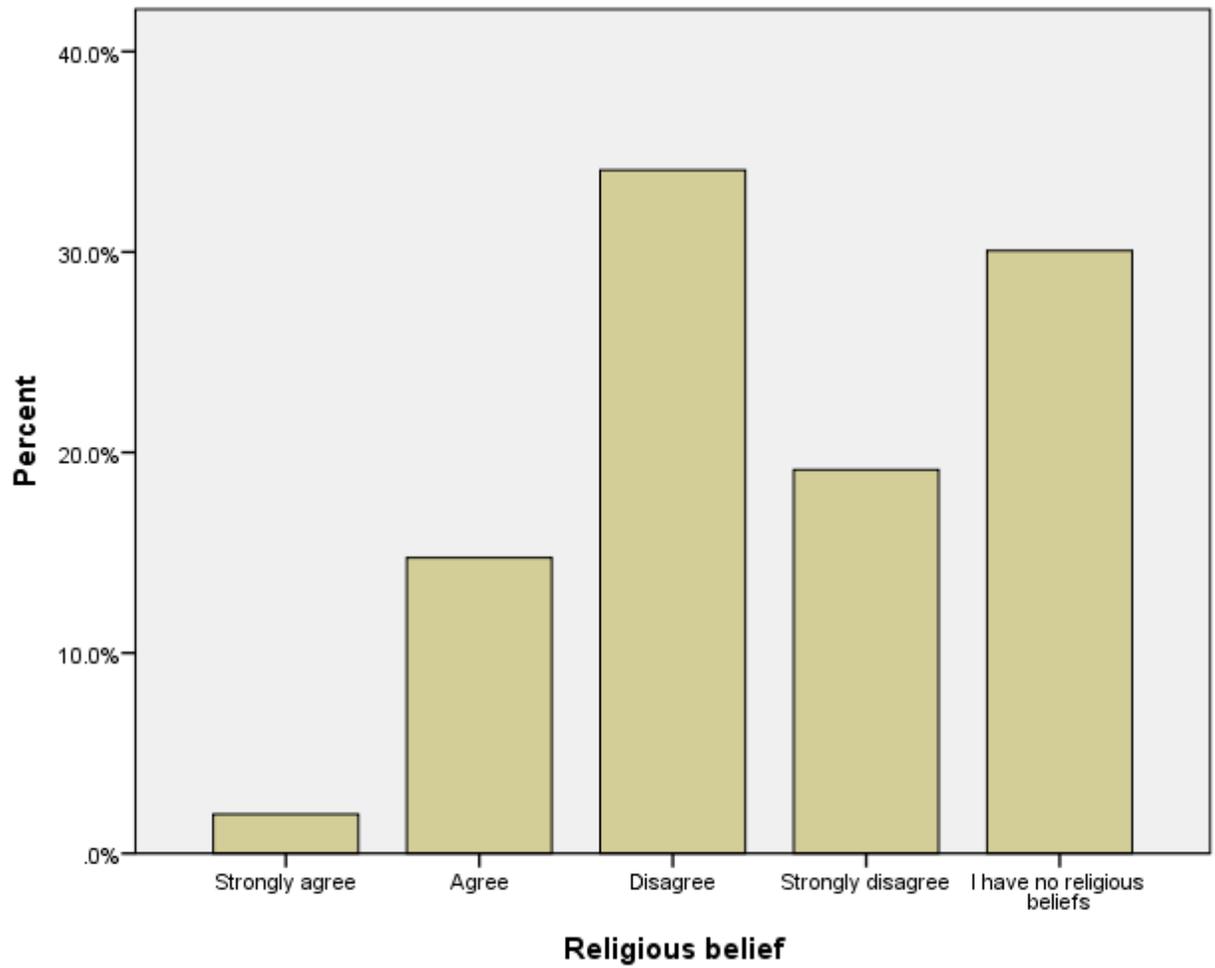
Figure 4: Number of exposure to alcohol marketing communications within the past week
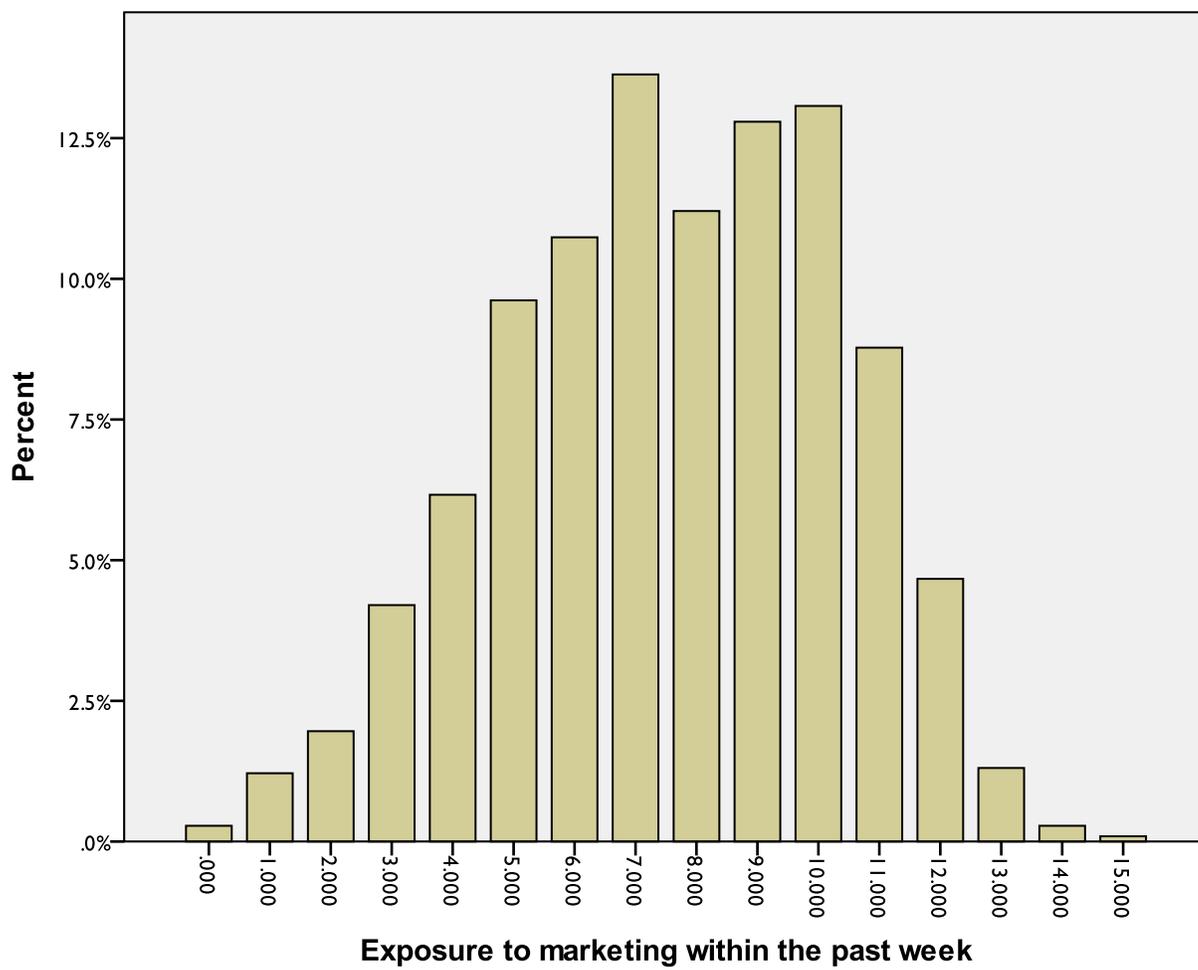
**Figure 5: Number of different ways respondents engaged with alcohol marketing communications**
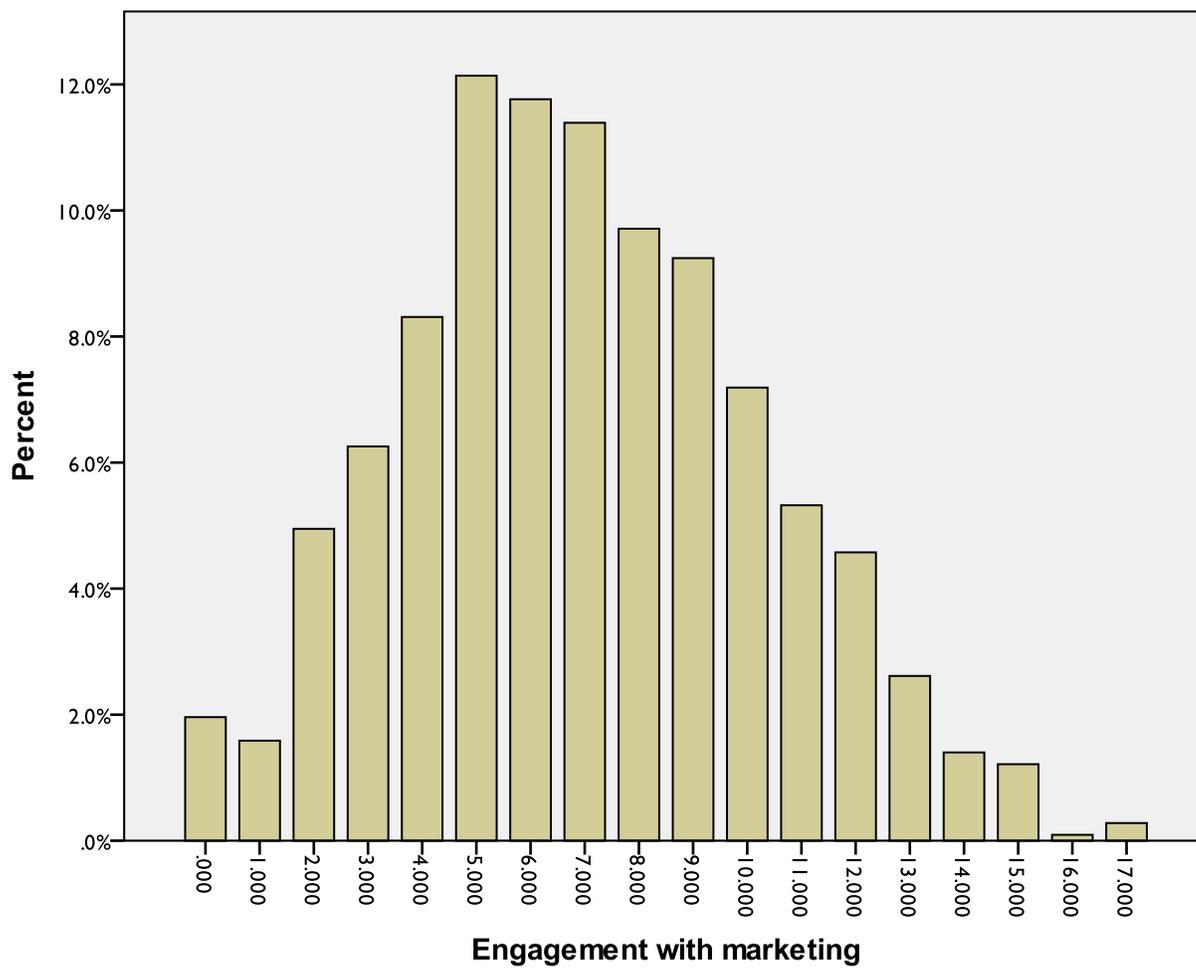
Figure 6: Number of different ways respondents engaged with online alcohol marketing communications
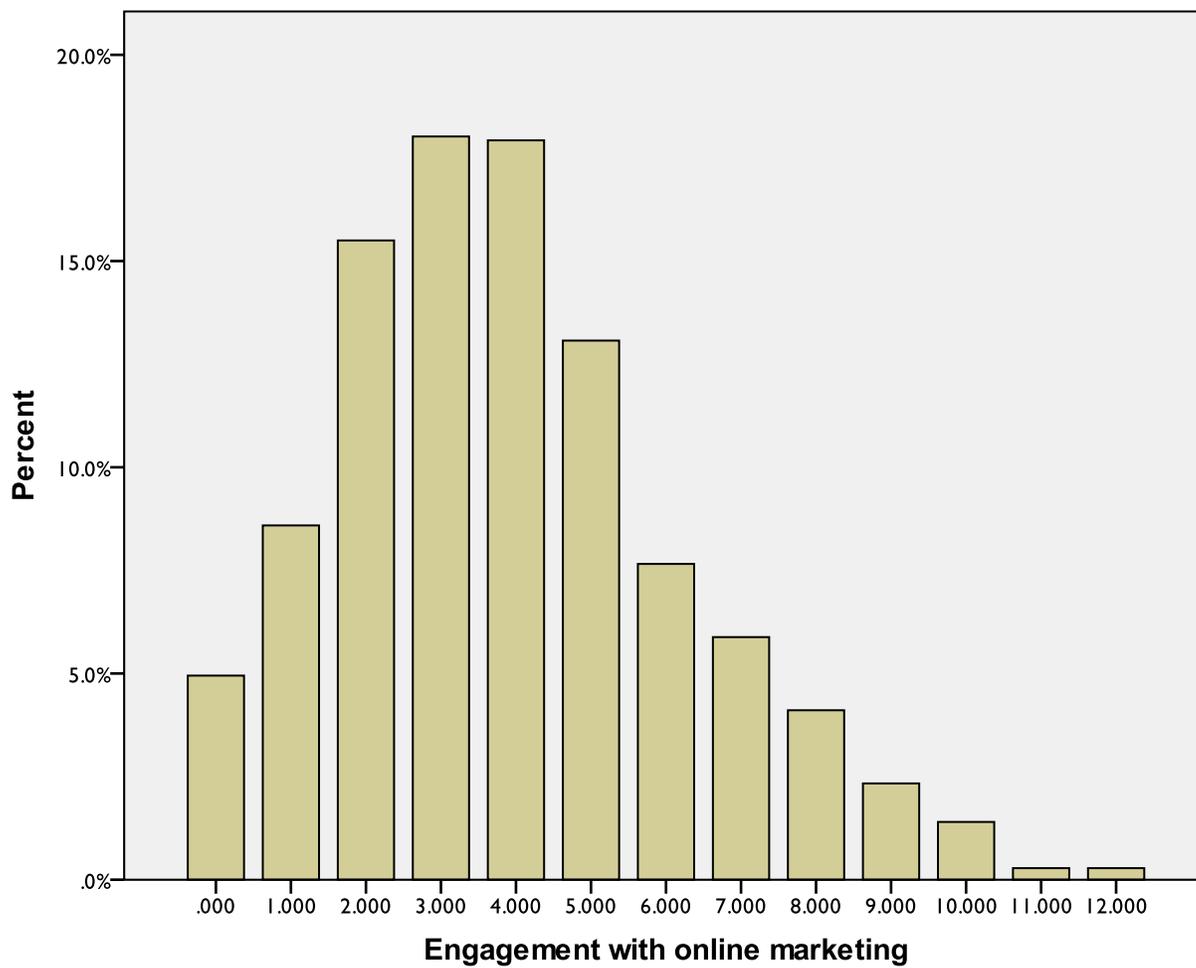
Table 4: Creation of social norms weighted index

Note: All correlation coefficients were statistically significant at least at the 0.01 level

Reference Group	Correlation coefficient – reference group perceived descriptive norm for frequency of drinking and personal frequency of drinking	Correlation coefficient – reference group perceived descriptive norm for frequency of drinking to get drunk and personal frequency of drinking to get drunk	Correlation coefficient – combined injunctive norm variable for reference group and personal frequency of drinking to get drunk	Average correlation coefficient	Weighted average using average person of same age as the base
Close friends	0.387	0.53	Not applicable	0.459	2.9
Average student in the DIT	0.153	0.302	0.187	0.214	1.35
Average person of the same age in Ireland	0.122	0.206	0.146	0.158	1

Table 5: Logistic regression of association between weekly drinking status and exposure to marketing communications within the past week

Dependent variable: Frequency of drinking			
1= Once per week or more; 0 = Less than once per week	n=1071	Adjusted OR (95% CI)	p-value
Block 1			
Mother's drinking			0.507
Mother does not drink/Not sure/Not applicable	208	1.00	
Mother does drink	863	1.13 (0.79 to 1.61)	
Father's drinking			0.280
Father does not drink/Not sure/Not applicable	221	1.00	
Father does drink	850	1.21 (0.86 to 1.71)	
Sibling's drinking			0.770
Sibling does not drink/Not sure/Not applicable	221	1.00	
Sibling does drink	850	1.05 (0.75 to 1.48)	
Block 2			
Disposable income	1071	1.21 (1.09 to 1.35)	<0.001
Age of first drink	1071	0.80 (0.74 to 0.87)	<0.001
Fitness	1071	0.99 (0.90 to 1.10)	0.876
Religious beliefs influence my decision			0.002
Yes	179	1.00	
No	892	1.76 (1.23 to 2.50)	
Relatively free living conditions			<0.001
No	769	1.00	
Yes	302	1.92 (1.44 to 2.58)	
Block 3			
Age	1071	0.94 (0.87 to 1.03)	0.173
Gender			0.160
Female	557	1.00	
Male	514	1.21 (0.93 to 1.58)	
Ethnicity			0.001
Non-Irish	117	1.00	
Irish	954	2.16 (1.35 to 3.43)	
Block 4			
Studying for finals			0.635
Yes	355	1.00	
No	716	0.93 (0.69 to 1.26)	
Block 5			
Communication about marketing	1071	1.26 (1.07 to 1.47)	0.005
Block 6			
Exposure to marketing within the past week	1071	1.08 (1.02 to 1.13)	0.005

Model summary at each block				
	Test of model coefficients			Nagelkerke R^2
	X^2	df	p-value	
Block 1	11.63	3	0.009	0.014
Block 2	79.16	5	<0.001	0.108
Block 3	20.95	3	<0.001	0.132
Block 4	0.58	1	0.445	0.133
Block 5	14.23	1	<0.001	0.149
Block 6	7.89	1	0.005	0.157
Final model	134.45	14	<0.001	0.157

Note: One thousand and seventy one cases analysed. Cases correctly classified = 63.3%. 70.1% of those who drank at least once a week and 55.9% of those who drank less than once a week were correctly classified.

Table 6: Logistic regression of association between weekly drinking status and engagement with marketing communications

Dependent variable: Frequency of drinking 1= Once per week or more; 0 = Less than once per week	n=1071	Adjusted OR (95% CI)	p-value
Block 1			
Mother's drinking			0.607
Mother does not drink/Not sure/Not applicable	208	1.00	
Mother does drink	863	1.10 (0.76 to 1.59)	
Father's drinking			0.360
Father does not drink/Not sure/Not applicable	221	1.00	
Father does drink	850	1.18 (0.83 to 1.67)	
Sibling's drinking			0.813
Sibling does not drink/Not sure/Not applicable	221	1.00	
Sibling does drink	850	1.04 (0.74 to 1.47)	
Block 2			
Disposable income	1071	1.18 (1.06 to 1.31)	0.003
Age of first drink	1071	0.84 (0.77 to 0.91)	<0.001
Fitness	1071	1.00 (0.90 to 1.11)	0.985
Religious beliefs influence my decision			0.004
Yes	179	1.00	
No	892	1.69 (1.18 to 2.43)	
Relatively free living conditions			<0.001
No	769	1.00	
Yes	302	1.96 (1.46 to 2.64)	
Block 3			
Age	1071	0.92 (0.84 to 1.00)	0.043
Gender			0.295
Female	557	1.00	
Male	514	1.16 (0.88 to 1.51)	
Ethnicity			0.011
Non-Irish	117	1.00	
Irish	954	1.85 (1.15 to 2.97)	
Block 4			
Studying for finals			0.811
Yes	355	1.00	
No	716	0.96 (0.71 to 1.31)	
Block 5			
Communication about marketing	1071	1.17 (0.99 to 1.37)	0.060
Block 6			
Engagement with marketing	1071	1.16 (1.11 to 1.21)	<0.001

Model summary at each block

	Test of model coefficients			Nagelkerke R^2
	χ^2	df	p-value	
Block 1	11.63	3	0.009	0.014
Block 2	79.16	5	<0.001	0.108
Block 3	20.95	3	<0.001	0.132
Block 4	0.58	1	0.445	0.133
Block 5	14.23	1	<0.001	0.149
Block 6	42.54	1	<0.001	0.195
Final model	169.10	14	<0.001	0.195

Note: One thousand and seventy one cases analysed. Cases correctly classified = 65.0%. 68.9% of those who drank at least once a week and 60.8% of those who drank less than once a week were correctly classified.

Table 7: Logistic regression of association between drinking once per week or more and engagement with online marketing communications

Dependent variable: Frequency of drinking 1= Once per week or more; 0 = Less than once per week	n=1071	Adjusted OR (95% CI)	p-value
Block 1			
Mother's drinking			0.463
Mother does not drink/Not sure/Not applicable	208	1.00	
Mother does drink	863	1.14 (0.80 to 1.64)	
Father's drinking			0.382
Father does not drink/Not sure/Not applicable	221	1.00	
Father does drink	850	1.17 (0.83 to 1.65)	
Sibling's drinking			0.717
Sibling does not drink/Not sure/Not applicable	221	1.00	
Sibling does drink	850	1.07 (0.76 to 1.50)	
Block 2			
Disposable income	1071	1.19 (1.07 to 1.32)	0.002
Age of first drink	1071	0.82 (0.76 to 0.89)	<0.001
Fitness	1071	1.01 (0.91 to 1.11)	0.916
Religious beliefs influence my decision			0.004
Yes	179	1.00	
No	892	1.70 (1.19 to 2.42)	
Relatively free living conditions			<0.001
No	769	1.00	
Yes	302	1.94 (1.45 to 2.61)	
Block 3			
Age	1071	0.93 (0.86 to 1.01)	0.093
Gender			0.180
Female	557	1.00	
Male	514	1.20 (0.92 to 1.57)	
Ethnicity			0.002
Non-Irish	117	1.00	
Irish	954	2.06 (1.29 to 3.29)	
Block 4			
Studying for finals			0.730
Yes	355	1.00	
No	716	0.95 (0.70 to 1.28)	
Block 5			
Communication about marketing	1071	1.20 (1.02 to 1.41)	0.026
Block 6			
Engagement with online marketing	1071	1.17 (1.10 to 1.24)	<0.001

Model summary at each block

	Test of model coefficients			Nagelkerke R^2
	χ^2	df	p-value	
Block 1	11.63	3	0.009	0.014
Block 2	79.16	5	<0.001	0.108
Block 3	20.95	3	<0.001	0.132
Block 4	0.58	1	0.445	0.133
Block 5	14.23	1	<0.001	0.149
Block 6	24.11	1	<0.001	0.175
Final model	150.67	14	<0.001	0.175

Note: One thousand and seventy one cases analysed. Cases correctly classified = 63.9%. 68.7% of those who drank at least once a week and 58.6% of those who drank less than once a week were correctly classified.

Table 8: Logistic regression of association between frequency of drinking to get drunk and exposure to alcohol marketing communications within the past week

Dependent variable: Frequency of drinking to get drunk 1= Once per week or more; 0 = Less than once per week	n=1071	Adjusted OR (95% CI)	p-value
Block 1			
Mother's drinking			0.483
Mother does not drink/Not sure/Not applicable	208	1.00	
Mother does drink	863	0.86 (0.57 to 1.30)	
Father's drinking			0.213
Father does not drink/Not sure/Not applicable	221	1.00	
Father does drink	850	1.30 (0.86 to 1.95)	
Sibling's drinking			0.175
Sibling does not drink/Not sure/Not applicable	221	1.00	
Sibling does drink	850	1.33 (0.88 to 2.00)	
Block 2			
Disposable income	1071	1.39 (1.24 to 1.57)	<0.001
Age of first drink	1071	0.78 (0.72 to 0.86)	<0.001
Fitness	1071	0.96 (0.86 to 1.08)	0.535
Religious beliefs influence my decision			0.217
Yes	179	1.00	
No	892	1.31 (0.86 to 1.99)	
Relatively free living conditions			<0.001
No	769	1.00	
Yes	302	1.83 (1.32 to 2.53)	
Block 3			
Age	1071	0.88 (0.80 to 0.97)	0.007
Gender			0.324
Female	557	1.00	
Male	514	1.17 (0.86 to 1.58)	
Ethnicity			<0.001
Non-Irish	117	1.00	
Irish	954	4.32 (2.06 to 9.04)	
Block 4			
Studying for finals			0.108
Yes	355	1.00	
No	716	0.76 (0.54 to 1.06)	
Block 5			
Communication about marketing	1071	1.38 (1.15 to 1.64)	<0.001
Block 6			
Exposure to marketing within the past week	1071	1.04 (0.98 to 1.10)	0.199

Model summary at each block

	Test of model coefficients			Nagelkerke R^2
	χ^2	df	p-value	
Block 1	12.25	3	0.007	0.017
Block 2	74.79	5	<0.001	0.114
Block 3	31.70	3	<0.001	0.153
Block 4	3.94	1	0.047	0.158
Block 5	16.74	1	<0.001	0.178
Block 6	1.66	1	0.198	0.180
Final model	141.08	14	<0.001	0.180

Note: One thousand and seventy one cases analysed. Cases correctly classified = 74.4%. 19.6% of those who drank at least once a week and 94.3% of those who drank less than once a week were correctly classified.

Table 9: Logistic regression of association between frequency of drinking to get drunk and engagement with alcohol marketing communications

Dependent variable: Frequency of drinking to get drunk			
1= Once per week or more; 0 = Less than once per week	n=1071	Adjusted OR (95% CI)	p-value
Block 1			
Mother's drinking			0.480
Mother does not drink/Not sure/Not applicable	208	1.00	
Mother does drink	863	0.86 (0.57 to 1.30)	
Father's drinking			0.250
Father does not drink/Not sure/Not applicable	221	1.00	
Father does drink	850	1.27 (0.84 to 1.91)	
Sibling's drinking			0.192
Sibling does not drink/Not sure/Not applicable	221	1.00	
Sibling does drink	850	1.31 (0.87 to 1.98)	
Block 2			
Disposable income	1071	1.37 (1.22 to 1.55)	<0.001
Age of first drink	1071	0.80 (0.73 to 0.87)	<0.001
Fitness	1071	0.97 (0.86 to 1.09)	0.592
Religious beliefs influence my decision			0.264
Yes	179	1.00	
No	892	1.27 (0.83 to 1.94)	
Relatively free living conditions			<0.001
No	769	1.00	
Yes	302	1.85 (1.34 to 2.56)	
Block 3			
Age	1071	0.87 (0.79 to 0.95)	0.003
Gender			0.393
Female	557	1.00	
Male	514	1.14 (0.84 to 1.55)	
Ethnicity			<0.001
Non-Irish	117	1.00	
Irish	954	4.06 (1.93 to 8.53)	
Block 4			
Studying for finals			0.125
Yes	355	1.00	
No	716	0.76 (0.54 to 1.08)	
Block 5			
Communication about marketing	1071	1.33 (1.12 to 1.59)	0.001
Block 6			
Engagement with marketing	1071	1.07 (1.02 to 1.12)	0.007

Model summary at each block				
	Test of model coefficients			Nagelkerke R^2
	X^2	df	p-value	
Block 1	12.25	3	0.007	0.017
Block 2	74.79	5	<0.001	0.114
Block 3	31.70	3	<0.001	0.153
Block 4	3.94	1	0.047	0.158
Block 5	16.74	1	<0.001	0.178
Block 6	7.38	1	0.007	0.187
Final model	146.80	14	<0.001	0.187

Note: One thousand and seventy one cases analysed. Cases correctly classified = 75.1%. 20.0% of those who drank at least once a week and 95.0% of those who drank less than once a week were correctly classified.

Table 10: Logistic regression of association between frequency of drinking to get drunk and engagement with online alcohol marketing communications

Dependent variable: Frequency of drinking to get drunk 1= Once per week or more; 0 = Less than once per week	n=1071	Adjusted OR (95% CI)	p-value
Block 1			
Mother's drinking			0.517
Mother does not drink/Not sure/Not applicable	208	1.00	
Mother does drink	863	0.87 (0.58 to 1.32)	
Father's drinking			0.249
Father does not drink/Not sure/Not applicable	221	1.00	
Father does drink	850	1.27 (0.85 to 1.91)	
Sibling's drinking			0.170
Sibling does not drink/Not sure/Not applicable	221	1.00	
Sibling does drink	850	1.33 (0.88 to 2.00)	
Block 2			
Disposable income	1071	1.38 (1.22 to 1.55)	<0.001
Age of first drink	1071	0.79 (0.72 to 0.86)	<0.001
Fitness	1071	0.97 (0.86 to 1.09)	0.611
Religious beliefs influence my decision			0.253
Yes	179	1.00	
No	892	1.28 (0.84 to 1.95)	
Relatively free living conditions			<0.001
No	769	1.00	
Yes	302	1.84 (1.33 to 2.55)	
Block 3			
Age	1071	0.87 (0.79 to 0.96)	0.005
Gender			0.329
Female	557	1.00	
Male	514	1.16 (0.86 to 1.57)	
Ethnicity			<0.001
Non-Irish	117	1.00	
Irish	954	4.29 (2.05 to 8.99)	
Block 4			
Studying for finals			0.120
Yes	355	1.00	
No	716	0.76 (0.54 to 1.07)	
Block 5			
Communication about marketing	1071	1.35 (1.13 to 1.61)	0.001
Block 6			
Engagement with online marketing	1071	1.07 (1.00 to 1.15)	0.037

Model summary at each block

	Test of model coefficients			Nagelkerke R^2
	χ^2	df	p-value	
Block 1	12.25	3	0.007	0.017
Block 2	74.79	5	<0.001	0.114
Block 3	31.70	3	<0.001	0.153
Block 4	3.94	1	0.047	0.158
Block 5	16.74	1	<0.001	0.178
Block 6	4.33	1	0.037	0.183
Final model	143.75	14	<0.001	0.183

Note: One thousand and seventy one cases analysed. Cases correctly classified = 74.7%. 18.6% of those who drank at least once a week and 95.0% of those who drank less than once a week were correctly classified.

Table 11: Interaction effects between communication about alcohol marketing communications and exposure to/engagement with alcohol marketing communications

Outcome variable	Interaction relationship	p-value
Weekly drinking status	*Exposure to marketing* and *communication about marketing*	0.389
Weekly drinking status	*Engagement with marketing* and *communication about marketing*	0.156
Weekly drinking status	*Engagement with online marketing* and *communication about marketing*	0.107
Weekly drinking to get drunk status	*Exposure to marketing* and *communication about marketing*	0.228
Weekly drinking to get drunk status	*Engagement with marketing* and *communication about marketing*	0.345
Weekly drinking to get drunk status	*Engagement with online marketing* and *communication about marketing*	0.515

Table 12: Logistic regression for association between different types of social norms and frequency of drinking to get drunk

Dependent variable: Frequency of drinking to get drunk			
1= Once per week or more; 0 = Less than once per week	n=1051	Adjusted OR (95% CI)	p-value
Block 1			
Mother's drinking			0.490
Mother does not drink/Not sure/Not applicable	202	1.00	
Mother does drink	849	1.19 (0.72 to 1.97)	
Father's drinking			0.881
Father does not drink/Not sure/Not applicable	215	1.00	
Father does drink	836	0.96 (0.575 to 1.608)	
Sibling's drinking			0.143
Sibling does not drink/Not sure/Not applicable	214	1.00	
Sibling does drink	237	1.44 (0.882 to 2.37)	
Block 2			
Disposable income	1051	1.22 (1.09 to 1.37)	<0.001
Age of first drink	1051	0.86 (0.77 to 0.97)	0.011
Fitness	1051	0.99 (0.86 to 1.14)	0.905
Religious beliefs influence my decision			0.090
Yes	174	1.00	
No	877	1.54 (0.93 to 2.55)	
Relatively free living conditions			<0.001
No	755	1.00	
Yes	296	2.19 (1.43 to 3.33)	
Block 3			
Age	1051	0.96 (0.85 to 1.08)	0.548
Gender			0.216
Female	547	1.00	
Male	504	1.27 0.87 to 1.85	
Ethnicity			0.020
Non-Irish	112	1.00	
Irish	939	2.79 (1.17 to 6.60)	
Block 4			
Studying for finals			0.794
Yes	346	1.00	
No	705	0.94 (0.60 to 1.46)	
Block 5			
Communication about marketing	1051	1.24 (0.99 to 1.55)	0.054
Block 6			
Engagement with alcohol marketing	1051	1.02 (0.96 to 1.08)	0.510
Block 7			
Susceptibility to normative influence	1051	0.98 (0.76 to 1.26)	0.888
Block 8			
Descriptive norms			
Perceived drinking to get drunk by friends			<0.001
Less than once per week	503	1.00	
Once per week or more	548	127.14 (38.84 to 416.16)	
Block 9			
Perceived drinking to get drunk of DIT students			0.177
Less than once per week	288	1.00	
Once per week or more	763	1.71 (0.78 to 3.76)	
Block 10			
Perceived drinking to get drunk by average person of same age			0.965
Less than once per week	274	1.00	
Once per week or more	777	1.01 (0.51 to 2.02)	
Block 11			0.217
Injunctive norm universal variable	1051	0.97 (0.93 to 1.01)	
Block 12			
Subjective norms			
Friends weekend/weekday drunkenness	1051	1.01 (1.00 to 1.02)	0.001
Parents weekend.weekday drunkenness	1051	1.01 (0.99 to 1.02)	0.319

Model summary at each block

	Test of model coefficients			Nagelkerke R^2
	x^2	df	p-value	
Block 1	10.30	3	0.016	0.014
Block 2	73.67	5	<0.001	0.112
Block 3	32.54	3	<0.001	0.153
Block 4	3.60	1	0.055	0.157
Block 5	16.49	1	<0.001	0.178
Block 6	6.61	1	0.01	0.186
Block 7	6.19	1	0.013	0.193
Block 8	344.66	1	<0.001	0.546
Block 9	1.81	1	0.177	0.548
Block 10	0.04	1	0.951	0.548
Block 11	0.24	1	0.627	0.548
Block 12	14.06	2	0.001	0.560
Final model	510.29	21	<0.001	0.560

Note: One thousand and fifty one cases analysed. Cases correctly classified = 83.0%. 70.8% of those who drank at least

Table 13: Logistic regression of descriptive norm variables & personal frequency of drinking

Logistic regression of association between frequency of drinking and descriptive norm variables

Dependent variable: Frequency of drinking to get drunk 1= Once per week or more; 0 = Less than once per week	n=1071	Adjusted OR (95% CI)	p-value
Block 1			
Mother's drinking			0.216
Mother does not drink/Not sure/Not applicable	208	1.00	
Mother does drink	863	1.27 (0.87 to 1.87)	
Father's drinking			0.314
Father does not drink/Not sure/Not applicable	221	1.00	
Father does drink	850	1.21 (0.83 to 1.75)	
Sibling's drinking			0.502
Sibling does not drink/Not sure/Not applicable	221	1.00	
Sibling does drink	850	1.13 (0.79 to 1.62)	
Block 2			
Disposable income	1071	1.16 (1.06 to 1.26)	0.001
Age of first drink	1071	0.82 (0.726to 0.90)	<0.001
Fitness	1071	1.01 (0.90 to 1.13)	0.837
Religious beliefs influence my decision			0.004
Yes	179	1.00	
No	892	1.75 (1.19 to 2.56)	
Relatively free living conditions			<0.001
No	769	1.00	
Yes	302	1.92 (1.40 to 2.64)	
Block 3			
Age	1071	0.95 (0.87 to 1.04)	0.274
Gender			0.142
Female	557	1.00	
Male	514	1.23 (0.93 to 1.64)	
Ethnicity			0.013
Non-Irish	117	1.00	
Irish	954	1.87 (1.14 to 3.07)	
Block 4			
Studying for finals			0.897
Yes	355	1.00	
No	716	0.98 (0.70 to 1.36)	
Block 5			
Communication about marketing	1071	1.27 (1.07 to 1.50)	0.005
Block 6			
Perceived drinking by friends			<0.001
Less than once per week	182	1.00	
Once per week or more	889	19.73 (10.51 to 37.01)	
Block 7			
Perceived drinking by average DIT student			0.785
Less than once per week	60	1.00	
Once per week or more	1011	0.89 (0.40 to 1.99)	
Block 8			
Perceived drinking by average person of the same age			0.610
Less than once per week	67	1.00	
Once per week or more	1004	1.22 (0.57 to 2.60)	

Model summary at each block

	Test of model coefficients			Nagelkerke R^2
	χ^2	df	p-value	
Block 1	11.63	3	0.009	0.014
Block 2	78.64	3	<0.001	0.108
Block 3	21.36	3	<0.001	0.132
Block 4	14.76	1	0.001	0.148
Block 5	171.28	1	<0.001	0.324
Block 6	0.01	1	0.943	0.324
Block 7	0.26	1	0.611	0.324
Final model	297.94	16	<0.001	0.324

Note: One thousand and seventy one cases analysed. Cases correctly classified = 74.7%. 18.6% of those who drank at least once a week and 95.0% of those who drank less than once a week were correctly classified.

Table 14: Mediation calculations for H3a – perceived close friend drinking as a mediator of the relationship between engagement with marketing and frequency of drinking

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.12	0.31	<0.001				
Y -> MX	2.926	0.315	<0.001				
Mediation calculations				3.871	9.289	3.55	<0.001

X = engagement with marketing
M = perceived descriptive norms for frequency of drinking by close friends
Y = personal frequency of drinking
Note: All models were estimated with logistic regression and controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, studying for finals, communication about marketing

Table 15: Mediation calculations for H3b – perceived close friend drinking to get drunk as a mediator of the relationship between engagement with marketing and frequency of drinking to get drunk

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.055	0.022	<0.05				
Y -> MX	5.075	0.590	<0.001				
Mediation calculations				2.50	8.601	2.385	<0.05

X = engagement with marketing
M = perceived descriptive norms for frequency of drinking to get drunk by close friends
Y = personal frequency of drinking to get drunk
Note: All regression models controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, studying for finals, communication about marketing

Figure 7: Model of engagement with marketing as a predictor of frequency of drinking to get drunk, mediated by perceived injunctive norms.
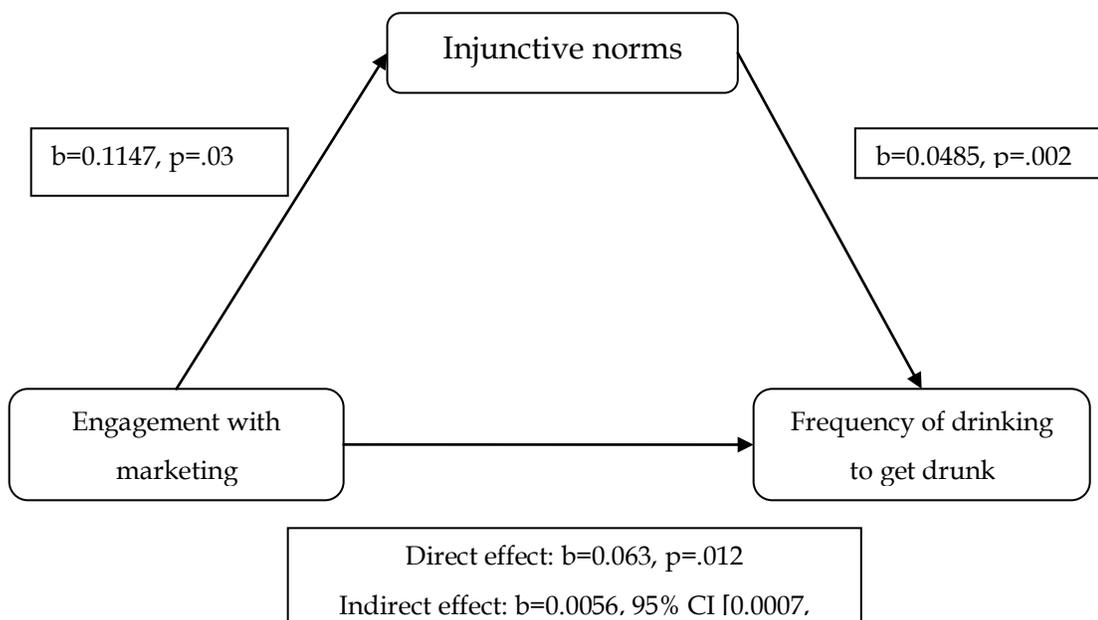
Table 16: Mediation calculations for perceived close friend drinking as a mediator of the relationship between engagement with social media marketing and frequency of drinking

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.159	0.065	<0.05				
Y -> MX	3.012	0.316	<0.001				
Mediation calculations				2.446	9.531	2.357	<0.05

X = engagement with social media marketing
M = perceived descriptive norms for frequency of drinking by close friends
Y = personal frequency of drinking
Note: All regression models were estimated with logistic regression and controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, studying for finals, communication about marketing

Table 17: Mediation calculations for perceived close friend drinking to get drunk as a mediator of the relationship between engagement with social media marketing and frequency of drinking to get drunk

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.100	0.046	<0.05				
Y -> MX	5.086	0.590	<0.001				
Mediation calculations				2.174	8.620	2.094	<0.05

X = engagement with social media marketing
M = perceived descriptive norms for frequency of drinking to get drunk by close friends
Y = personal frequency of drinking to get drunk
Note: All regression models were estimated with logistic regression and controlled for the same covariates –
family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness,
age ethnicity, gender, studying for finals, communication about marketing

Table 18: Multiple linear regression summary table of final model: Exposure to marketing communications within the past week and attitudes towards non-drinkers

	Unstandardised Coefficients		Standardised Coeffficients		
	B	**S.E.**	**Beta**	**t**	**Significance**
Constant	2.865	0.309		9.283	<0.001
Block 1					
Mother's drinking	-0.110	0.063	-.056	-1.741	0.082
Father's drinking	0.143	0.061	0.075	2.333	0.020
Sibling Drinking	-0.064	0.060	-0.033	-1.071	0.284
Block 2					
Disposable income	0.036	0.014	0.080	2.590	0.010
Age of first drink	-0.083	0.014	-0.184	-6.122	<0.001
Fitness	-0.049	0.018	-0.081	-2.694	0.007
Religiosity	0.024	0.062	0.012	0.393	0.694
Living conditions	0.051	0.051	0.030	1.006	0.315
Block 3					
Age	-0.016	0.013	-0.038	-1.205	0.228
Sex	0.159	0.047	0.102	3.354	0.001
Ethnicity	0.272	0.078	0.110	3.494	<0.001
Block 4					
Communication about marketing	0.080	0.028	0.088	2.863	0.04
Block 5					
Exposure to marketing in past week	0.009	0.009	0.030	0.954	0.340

Model summary at each block

	R	**R Square**	**Adj. R Sq.**	**F**	**Significance**
Block 1	0.096	0.009	0.006	3.305	0.02
Block 2	0.252	0.064	0.057	12.359	<0.001
Block 3	0.297	0.088	0.079	9.517	<0.001
Block 4	0.312	0.097	0.087	10.701	0.001
Block 5	0.313	0.098	0.087	0.910	0.340

Table 19: Multiple linear regression summary table of final model: Engagement with marketing communications and attitudes towards non-drinkers

	Unstandardised Coefficients		Standardised Coeffficients		
	B	**S.E.**	**Beta**	**t**	**Significance**
Constant	2.878	0.297		9.963	<0.001
Block 1					
Mother's drinking	-0.117	0.063	-0.060	-1.876	0.061
Father's drinking	0.137	0.061	0.071	2.252	0.025
Sibling Drinking	-0.069	0.059	-0.036	-1.115	0.248
Block 2					
Disposable income	0.029	0.014	0.065	2.116	0.035
Age of first drink	-0.072	0.014	-0.159	-5.242	<0.001
Fitness	-0.047	0.018	-0.078	-2.627	0.009
Religiosity	0.010	0.061	0.005	0.166	0.868
Living conditions	0.054	0.051	0.031	1.063	0.288
Block 3					
Age	-0.21	0.013	-0.049	-1.593	0.111
Sex	0.139	0.047	0.089	2.972	0.003
Ethnicity	0.221	0.078	0.089	2.840	0.005
Block 4					
Communication about marketing	0.054	0.028	0.060	1.964	0.050
Block 5					
Engagement with marketing	0.033	0.008	0.143	4.366	<0.001

Model summary at each block					
	R	**R Square**	**Adj. R Sq.**	**F**	**Significance**
Block 1	0.096	0.009	0.006	3.305	0.020
Block 2	0.252	0.064	0.057	12.359	<0.001
Block 3	0.297	0.088	0.079	9.517	<0.001
Block 4	0.312	0.097	0.087	10.701	0.001
Block 5	0.337	0.113	0.102	19.064	<0.001

Table 20: Multiple linear regression summary table of final model: Engagement with marketing communications online and attitudes towards non-drinkers

	Unstandardised Coefficients		Standardised Coeffficients		
	B	**S.E.**	**Beta**	**t**	**Significance**
Constant	2.862	0.298		9.593	<0.001
Block 1					
Mother's drinking	-0.107	0.063	-0.055	-1.713	o.087
Father's drinking	0.134	0.061	0.070	2.200	0.028
Sibling Drinking	-0.062	0.060	-0.032	-1.043	0.297
Block 2					
Disposable income	0.031	0.014	0.069	2.229	0.026
Age of first drink	-0.076	0.014	-0.170	-5.611	<0.001
Fitness	-0.046	0.018	-0.077	-2.555	0.011
Religiosity	0.013	0.062	0.006	0.207	0.836
Living conditions	0.054	0.051	0.031	1.065	0.287
Block 3					
Age	-0.018	0.013	-0.041	-1.341	0.180
Sex	0.148	0.047	0.095	3.162	0.002
Ethnicity	0.247	0.077	0.100	3.193	0.001
Block 4					
Communication about marketing	0.060	0.028	0.066	2.162	0.031
Block 5					
Engagement with marketing	0.037	0.011	0.108	3.427	0.001

Model summary at each block

	R	**R Square**	**Adj. R Sq.**	**F**	**Significance**
Block 1	0.096	0.009	0.006	3.305	0.020
Block 2	0.252	0.064	0.057	12.359	<0.001
Block 3	0.297	0.088	0.079	9.517	<0.001
Block 4	0.312	0.097	0.087	10.701	0.001
Block 5	0.328	0.107	0.096	11.745	0.001

Table 21: Interaction effects between communication about alcohol marketing communications and exposure to/engagement with alcohol marketing communications in multiple linear regression

Outcome variable	Interaction relationship	p-value
Attitudes towards non-drinkers on RANDS scale	*Engagement with marketing* and *communication about marketing*	0.645
Attitudes towards non-drinkers on RANDS scale	*Engagement with online marketing* and *communication about marketing*	0.741

Table 22: Mediation calculations for perceived close friend drinking as a mediator of the relationship between engagement with marketing and negative attitudes towards non-drinkers

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.121	0.031	<0.001				
Y -> MX	.074	0.62	0.233				
Mediation calculations							

X = engagement with marketing
M = perceived descriptive norms for frequency of drinking by close friends
Y = negative attitudes towards non-drinkers
Note: The M->X relationship was estimated with logistic regression and the Y->MX relationship was estimated with ordinary least squares regression. Both regression models controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, communication about marketing

Table 23: Mediation calculations for perceived close friend drinking to get drunk as a mediator of the relationship between engagement with marketing and negative attitudes towards non-drinkers

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.056	0.022	<0.05				
Y -> MX	0.295	0.47	<0.001				
Mediation calculations				2.545	6.276	2.33	<0.05

X = engagement with marketing
M = perceived descriptive norms for frequency of drinking to get drunk by close friends
Y = negative attitudes towards non-drinkers
Note: The M->X relationship was estimated with logistic regression and the Y->MX relationship was estimated with ordinary least squares regression. Both regression models controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, communication about marketing

Figure 8: Model of engagement with marketing as a predictor of negative attitudes towards non-drinkers, mediated by perceived injunctive norms.
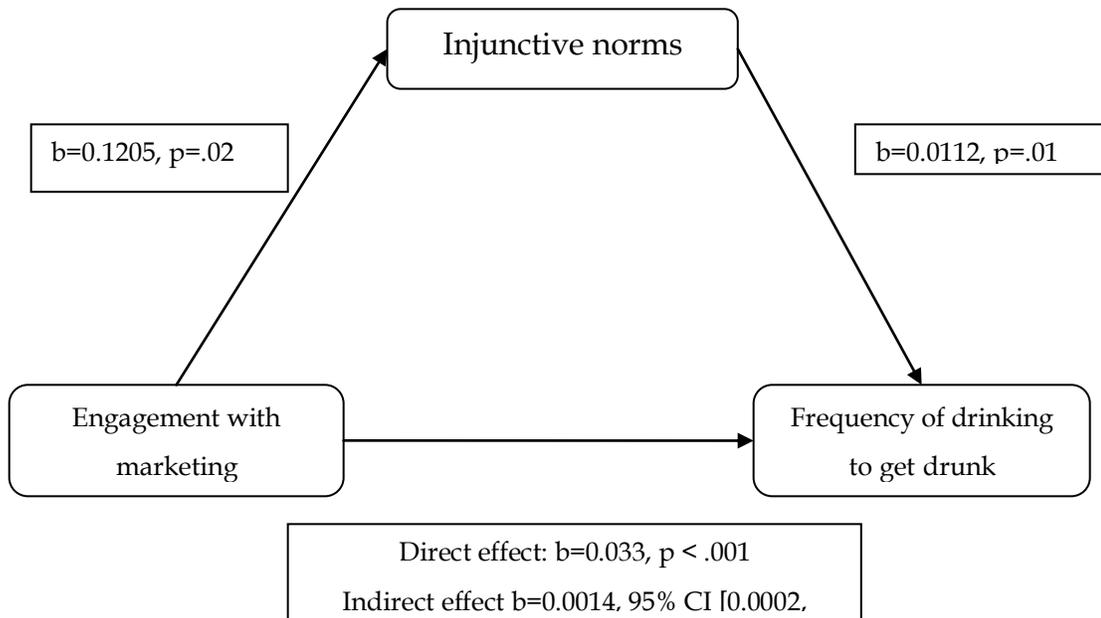
Table 24: Perceived frequency of peer drinking relative to personal frequency of drinking

	% of respondents who believe that reference group drinks less frequently than they themselves drink	% of respondents who believe that reference group drinks with the same frequency with which they themselves drink	% of respondents who believe that reference group drinks more frequently than they themselves drink
Close friends	3.4%	50.8%	45.8%
Average DIT student	5.2%	31.4%	63.4%
Average person of the same age in Ireland	5.8%	32%	62.2%

Table 25: Perceived frequency of peer drinking to get drunk relative to personal frequency of drinking

	% of respondents who believe that reference group drinks to get drunk less frequently than they themselves drink to get drunk	% of respondents who believe that reference group drinks to get drunk with the same frequency with which they themselves drink to get drunk	% of respondents who believe that reference group drinks to get drunk more frequently than they themselves drink to get drunk
Close friends	0.9%	46.8%	52.3%
Average DIT student	2.3%	26.7%	71%
Average person of the same age in Ireland	3.4%	26.6%	70%

Table 26: Perceived approval of drinking to get drunk at the weekend relative to personal approval

	Approve of drinking to get drunk at weekends less than they do themselves	Equivalent approval of drinking to get drunk at weekends	Approve of drinking to get drunk at weekends more than they do themselves
Average DIT student	8%	38.4%	53.6%
Average person of the same age in Ireland	8.1%	35.6%	56.3%

Table 27: Perceived approval of drinking to get drunk at on weekdays relative to personal approval

	Approve of drinking to get drunk on weekdays less than they do themselves	Equivalent approval of drinking to get drunk on weekdays	Approve of drinking to get drunk on weekdays more than they do themselves
Perceptions about the average DIT student	6.7%	31.6%	61.7%
Perceptions about the average person of the same age in Ireland	8.7%	31.3%	60%

Figure 9: Personal frequency of drinking and perceived drinking by close friends
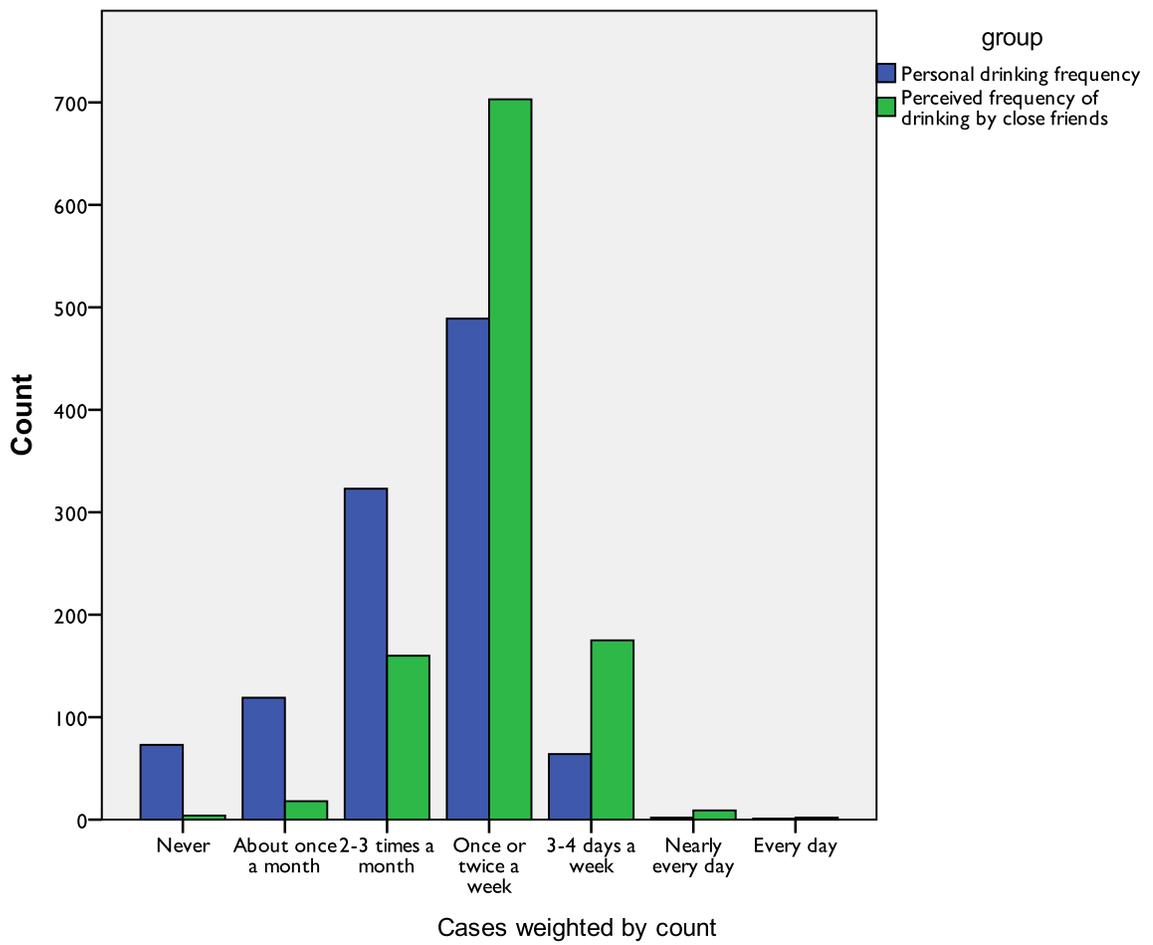
Figure 10: Personal frequency of drinking and perceived frequency of drinking by the average DIT student
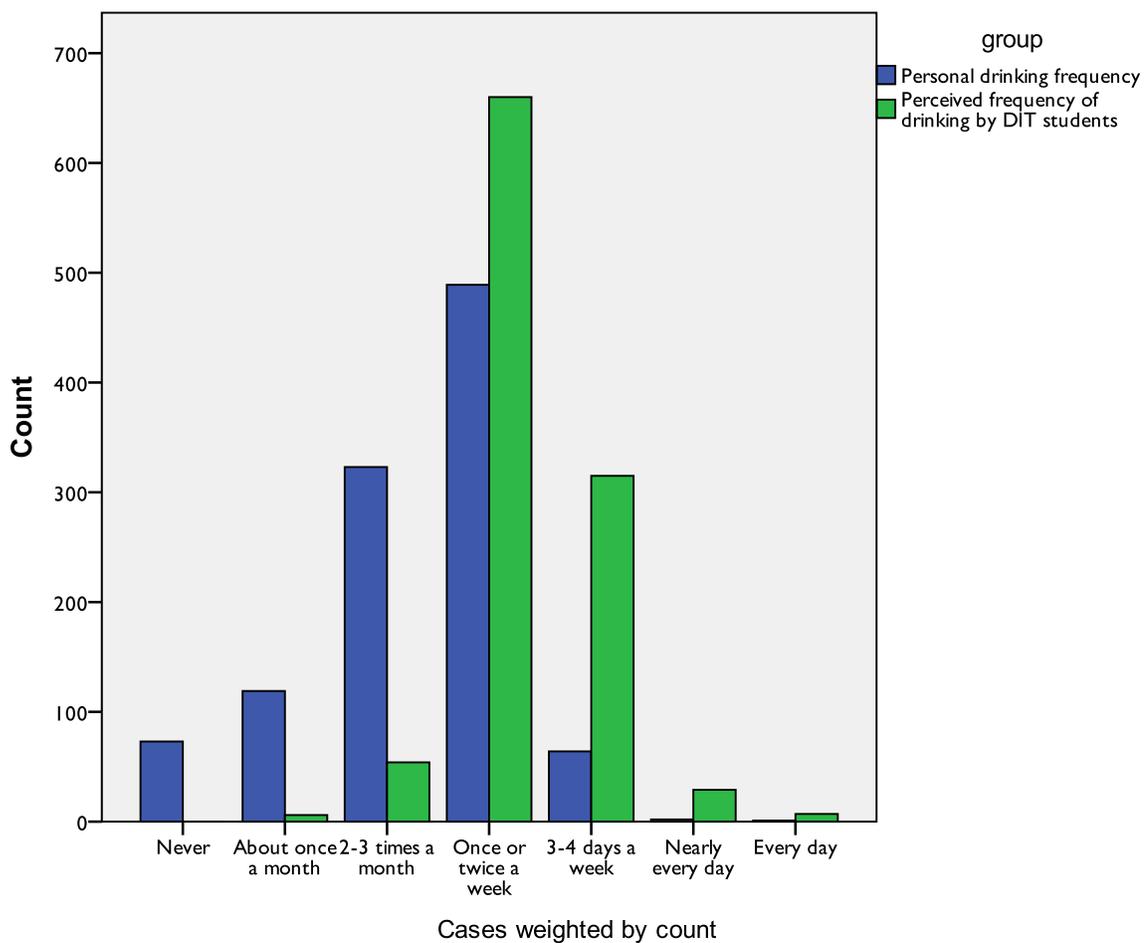
Figure 11: Personal frequency of drinking and perceived drinking by the average person of the same age in Ireland
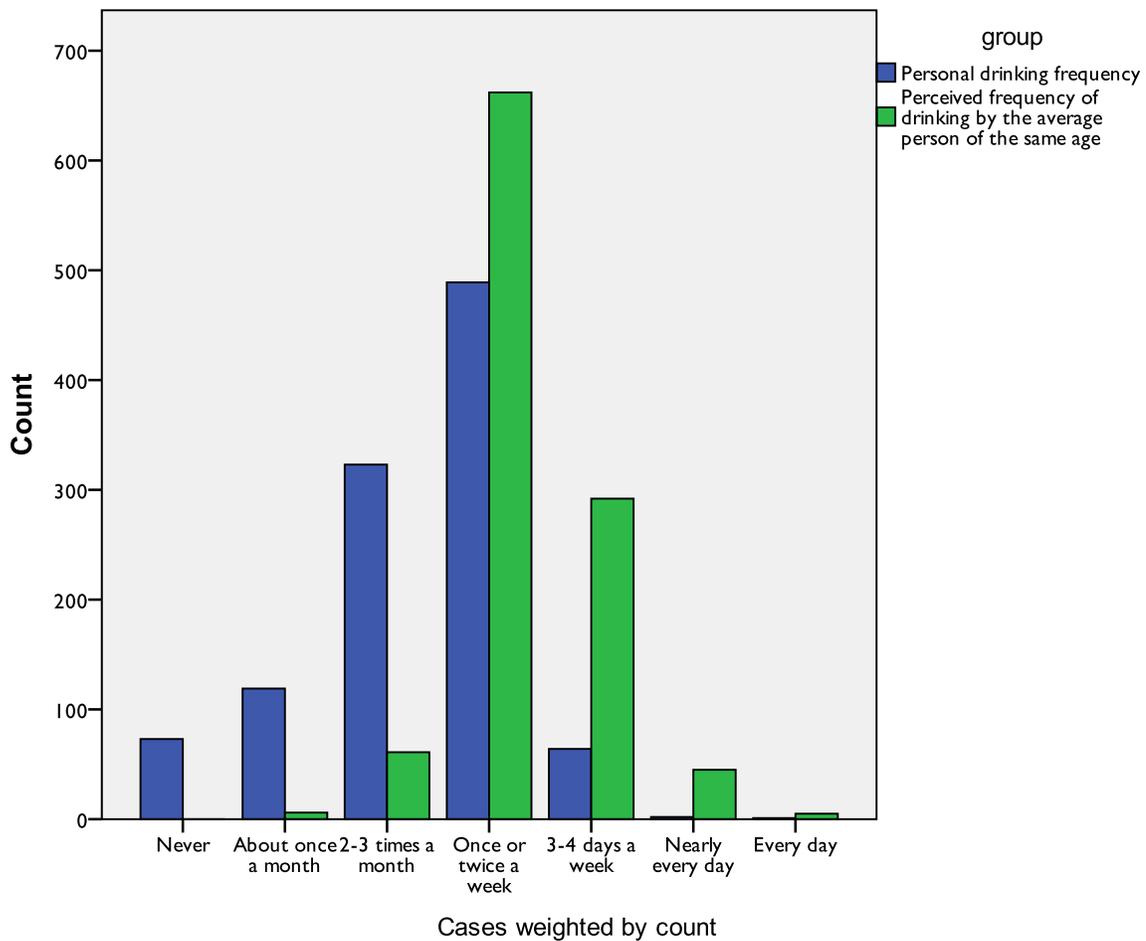
Figure 12: Personal frequency of drinking to get drunk and perceived frequency of drinking to get drunk by close friends
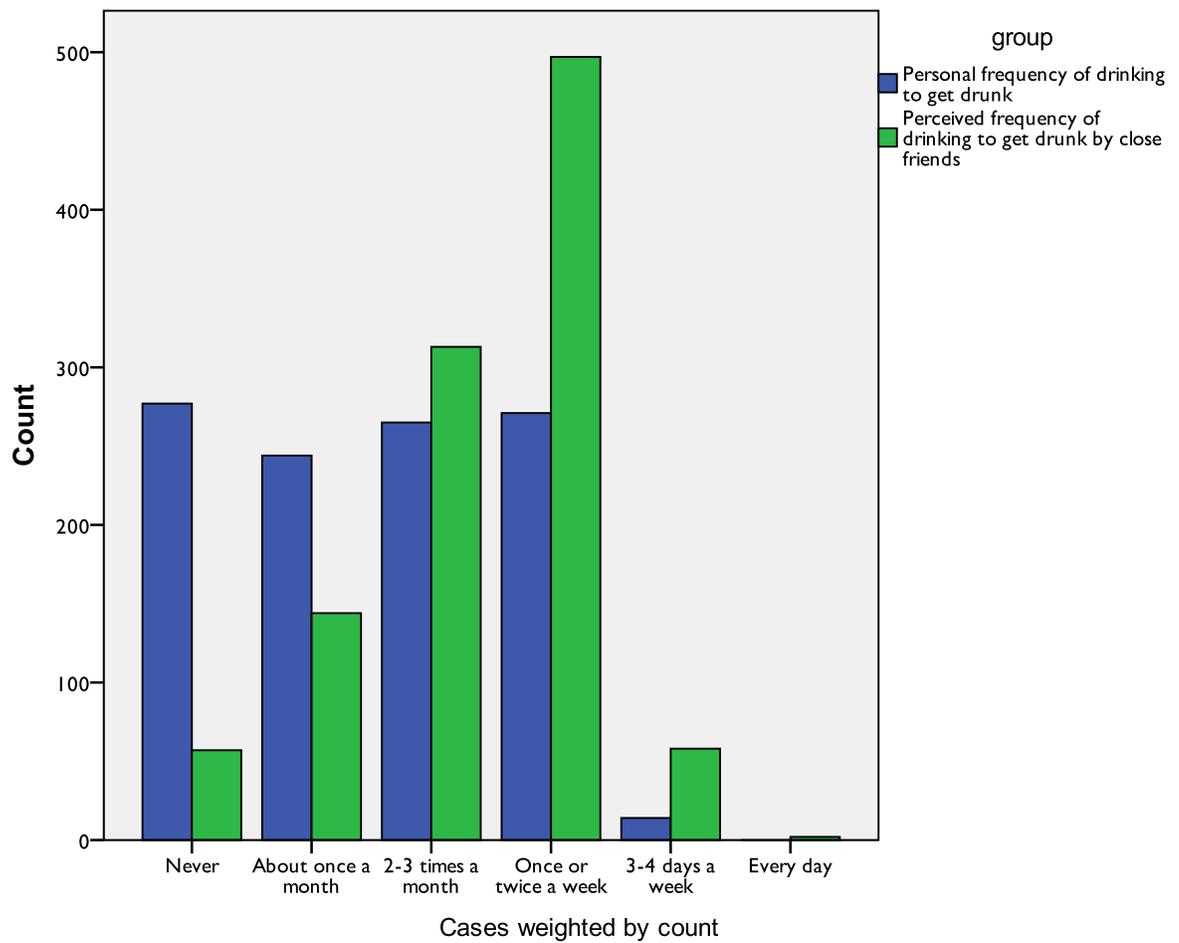
Figure 13: Personal frequency of drinking to get drunk and perceived frequency of drinking to get drunk by DIT students
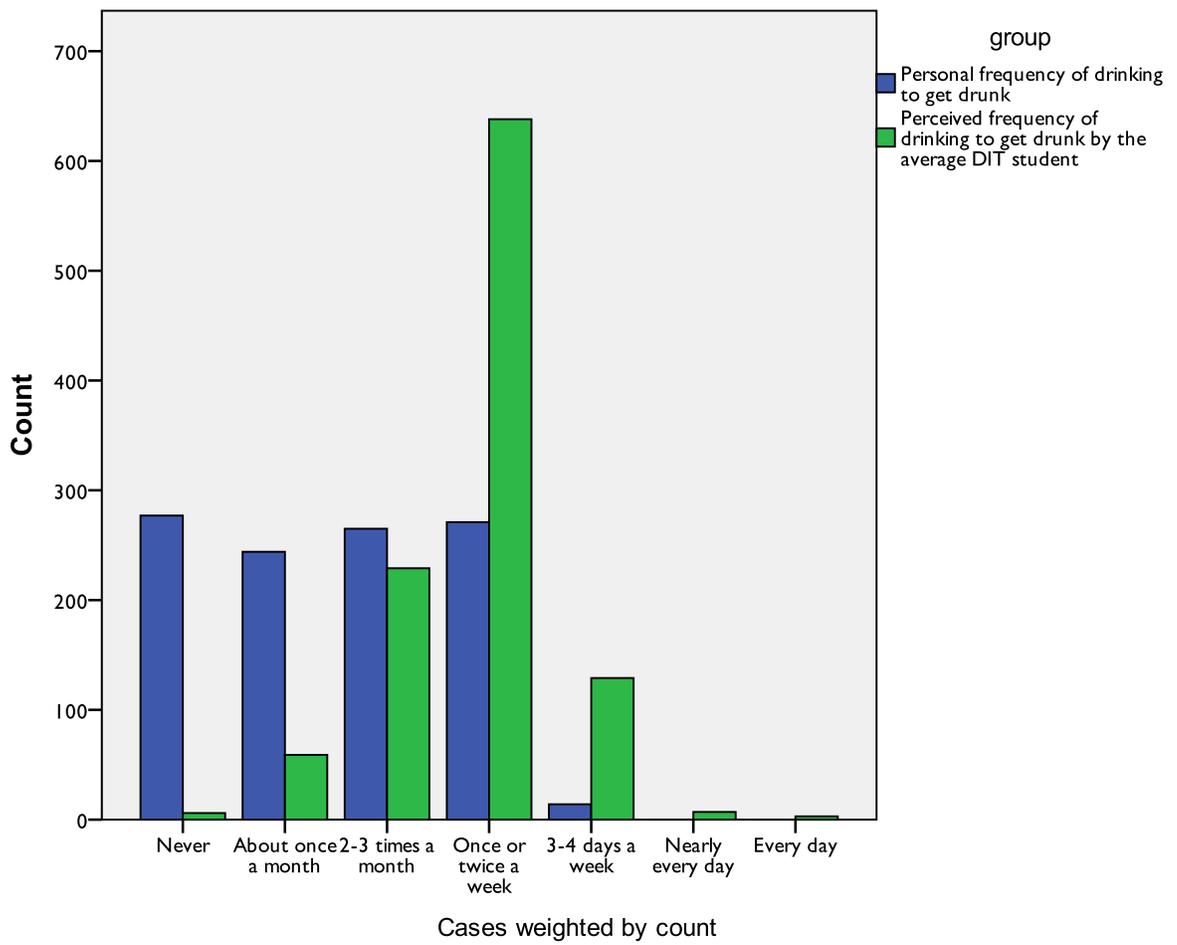
Figure 14: Personal frequency of drinking to get drunk and perceived frequency of drinking to get drunk by the average person of the same age in Ireland
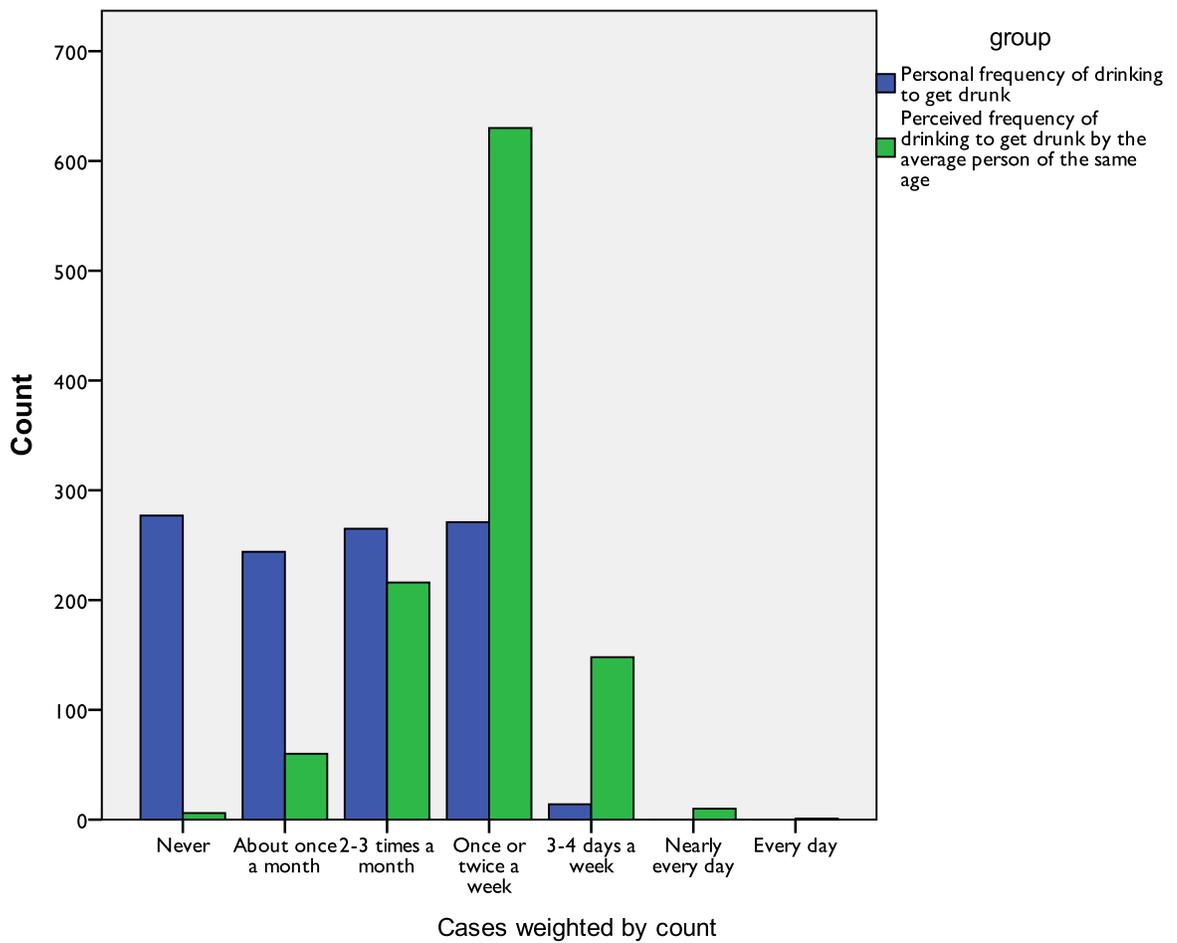
Figure 15: Personal approval of drinking to get drunk at weekends and perceived approval of DIT students
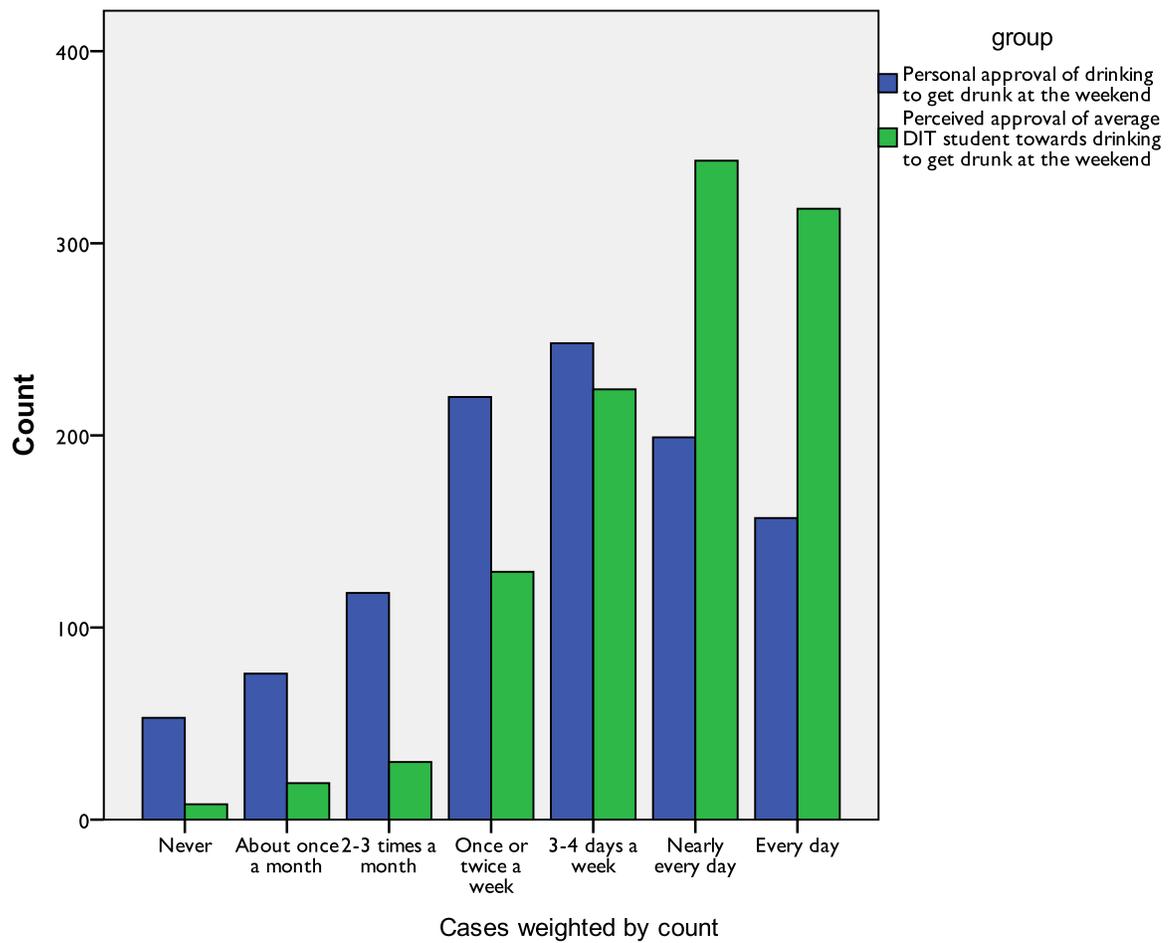
Figure 16: Personal approval of drinking to get drunk at the weekend and perceived approval of the average person the same age towards drinking to get drunk at the weekend.

Cases weighted by count
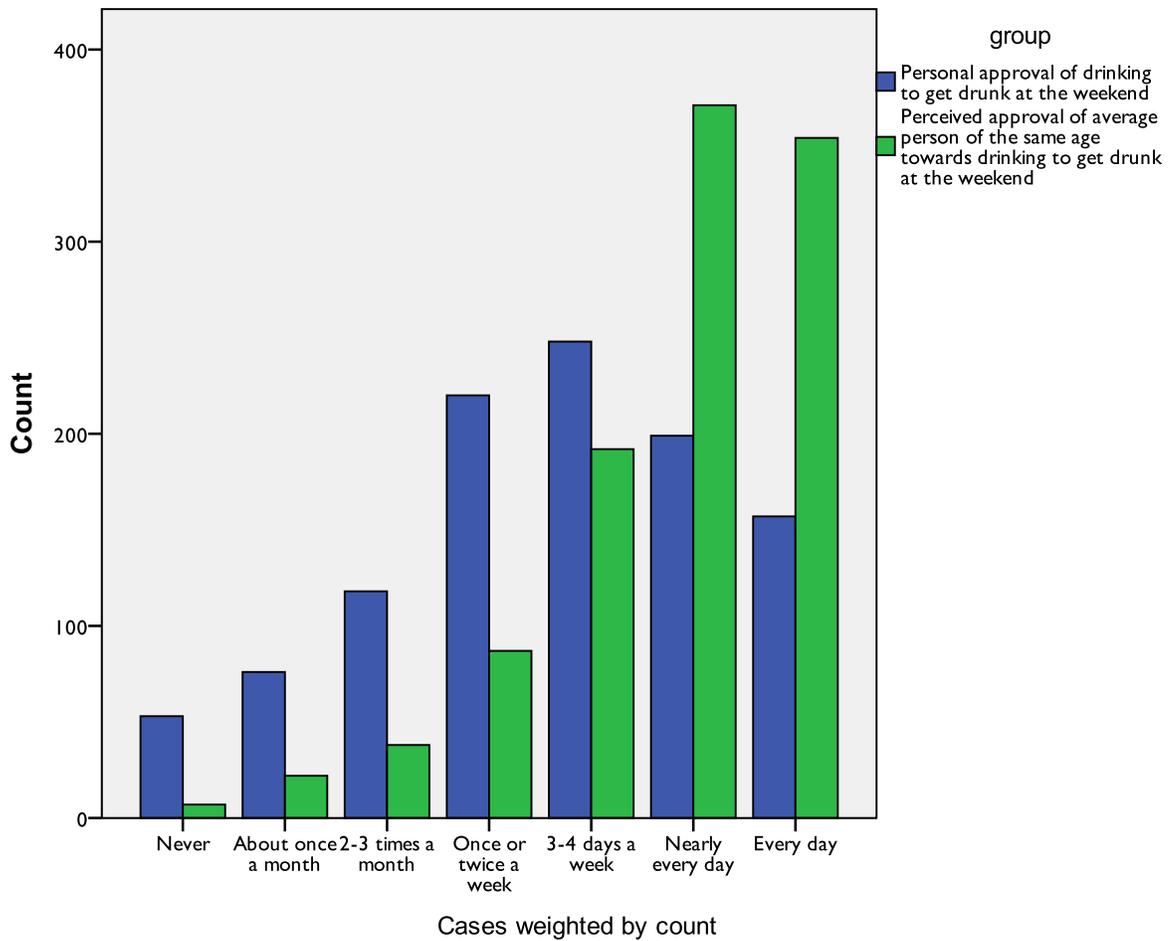
Figure 17: Personal approval of drinking to get drunk on a weekday and perceived approval of drinking to get drunk by the average DIT student
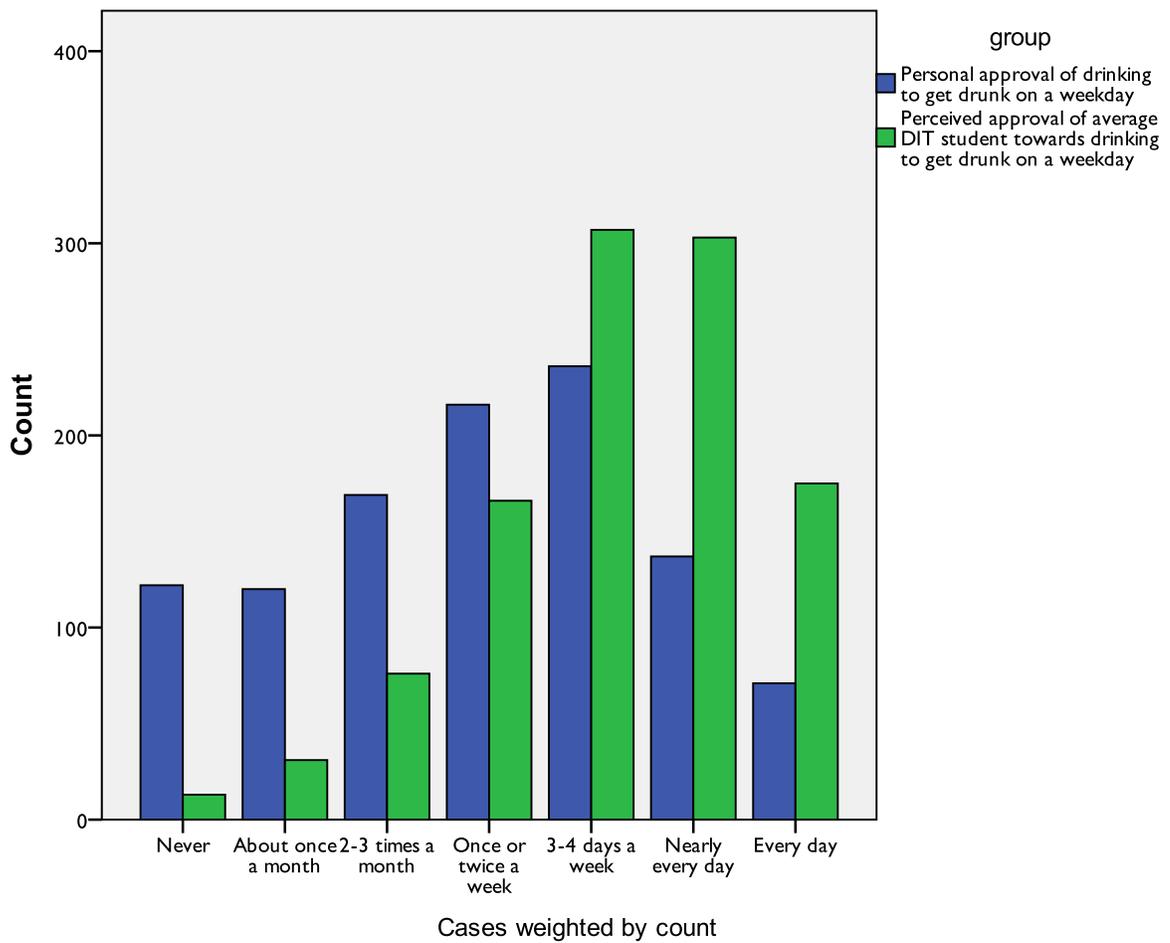
Figure 18: Personal approval of drinking to get drunk on a weekday and perceived approval of the average person the same age towards drinking to get drunk on a weekday

Cases weighted by count
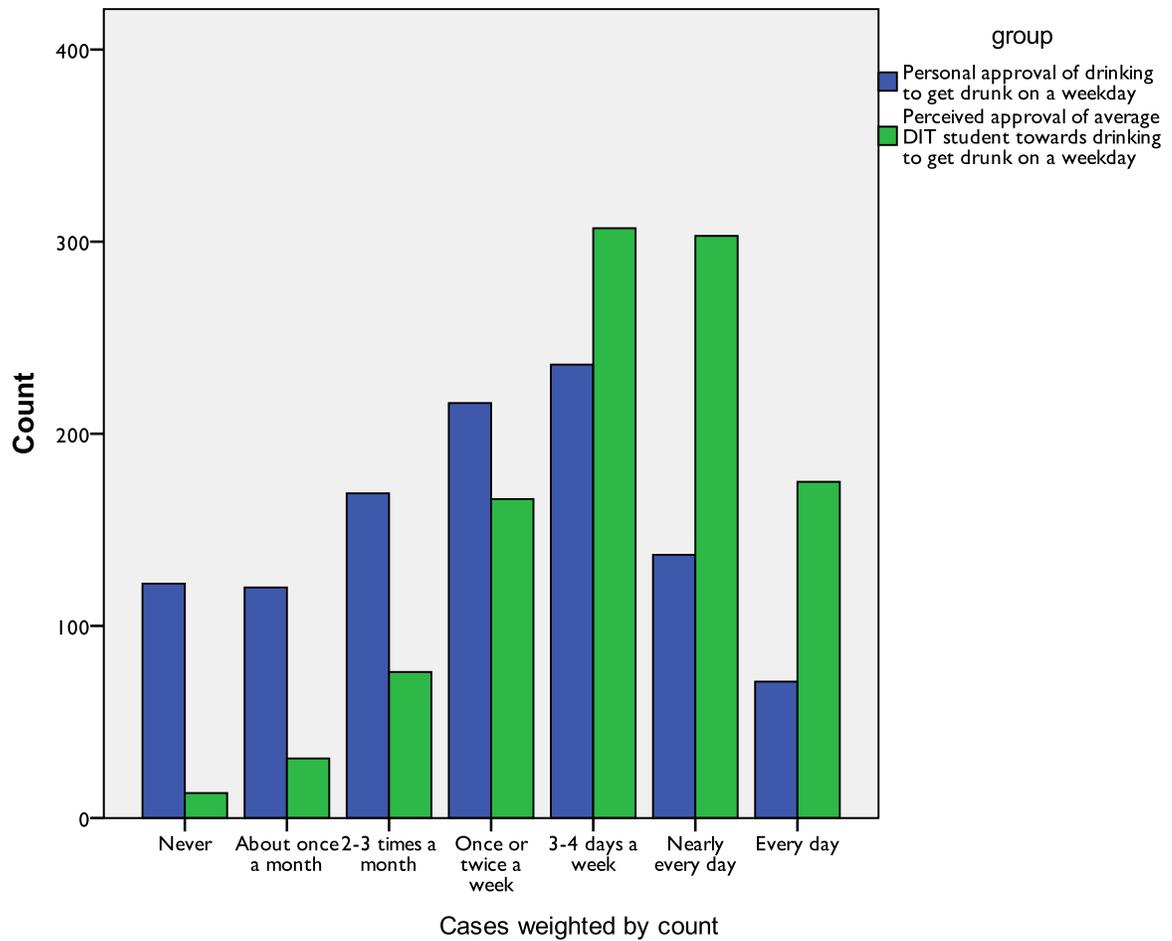
Table 28: Misperception of the actual DIT norm for both descriptive and injunctive norms

	Underestimated the DIT norm	Correctly estimated the DIT norm	Overestimated the DIT norms
Descriptive norm: Frequency of drinking	5.6%	61.6%	32.8%
Descriptive norm: Frequency of drinking to get drunk	6.1%	21.4%	72.5%
Injunctive norm: Approval of drinking to get drunk at the weekend	17.4%	20.9%	61.7%
Injunctive norm: Approval of drinking to get drunk at weekdays	11.2%	15.5%	73.3%

Table 29: Mediation calculations for H7a – overestimated descriptive norms for frequency of drinking as a mediator of the relationship between engagement with marketing and frequency of drinking

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.050	0.022	<0.05				
Y -> MX	0.769	0.149	<0.001				
Mediation calculations				2.272	5.161	2.048	<0.05

X = engagement with marketing
M = overestimated descriptive norms for frequency of drinking by close friends
Y = personal frequency of drinking
Note: All models were estimated with logistic regression and controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, studying for finals, communication about marketing

Table 30: Mediation calculations for H7b – overestimated descriptive norms as a mediator of the relationship between engagement with marketing and frequency of drinking to get drunk

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.015	0.024	0.522				
Y -> MX							
Mediation calculations							

X = engagement with marketing
M = overestimated descriptive norms for frequency of drinking to get drunk by close friends
Y = personal frequency of drinking to get drunk
Note: All models were estimated with logistic regression and controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, studying for finals, communication about marketing

Table 31: Mediation calculations for H7c(i) – overestimated injunctive norms for frequency of drinking to get drunk at the weekend as a mediator of the relationship between engagement with marketing and frequency of drinking to get drunk

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.029	0.022	0.177				
Y -> MX							
Mediation calculations							

X = engagement with marketing
M = overestimated injunctive norms for frequency of drinking to get drunk at the weekend
Y = personal frequency of drinking to get drunk
Note: All models were estimated with logistic regression and controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, studying for finals, communication about marketing

Table 32: Mediation calculations for H7c(ii) – overestimated injunctive norms for frequency of drinking to get drunk on weekdays as a mediator of the relationship between engagement with marketing and frequency of drinking to get drunk

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.078	0.025	<0.05				
Y -> MX	0.584	0.190	<0.01				
Mediation calculations				3.120	3.073	2.134	<0.05

X = engagement with marketing
M = overestimated injunctive norms for frequency of drinking to get drunk on weekdays
Y = personal frequency of drinking to get drunk
Note: All models were estimated with logistic regression and controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, studying for finals, communication about marketing

Table 33: Mediation calculations for H8a(i) – overestimated descriptive norms for frequency of drinking as a mediator of the relationship between engagement with marketing and negative attitudes towards non-drinkers

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.050	0.022	<0.05				
Y -> MX	-0.052	0.490	0.280				
Mediation calculations							

X = engagement with marketing
M = overestimated descriptive norms for frequency of drinking
Y = negative attitudes towards non-drinkers
Note: The M->X model was estimated with logistic regression and the Y->MX model was estimated with ordinary least squares regression. All models controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender,, communication about marketing

Table 34: Mediation calculations for H8a(ii) – overestimated descriptive norms for frequency of drinking to get drunk as a mediator of the relationship between engagement with marketing and negative attitudes towards non-drinkers

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.016	0.024	0.507				
Y -> MX							
Mediation calculations							

X = engagement with marketing
M = overestimated descriptive norms for frequency of drinking to get drunk
Y = negative attitudes towards non-drinkers
Note: The M->X model was estimated with logistic regression and the Y->MX model was estimated with ordinary least squares regression. All models controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, communication about marketing

Table 35: Mediation calculations for H8b(i) – overestimated injunctive norms for drinking to get drunk at the weekend as a mediator of the relationship between engagement with marketing and negative attitudes towards non-drinkers

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.031	0.022	0.151				
Y -> MX							
Mediation calculations							

X = engagement with marketing
M = overestimated injunctive norms for drinking to get drunk at the weekend
Y = negative attitudes towards non-drinkers
Note: The M->X model was estimated with logistic regression and the Y->MX model was estimated with ordinary least squares regression. All models controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender,, communication about marketing

Table 36: Mediation calculations for H8b(ii) – overestimated injunctive norms for drinking to get drunk on weekdays as a mediator of the relationship between engagement with marketing and negative attitudes towards non-drinkers

Model	Parameter Estimate	Standard error	p-value	Z_a	Z_b	$Z_{Mediation}$	p-value
M->X	0.080	0.025	0.151				
Y -> MX	0.137	0.052	<0.01				
Mediation calculations				3.200	2.634	1.977	,0.05

X = engagement with marketing
M = overestimated injunctive norms for drinking to get drunk on weekdays
Y = negative attitudes towards non-drinkers
Note: The M->X model was estimated with logistic regression and the Y->MX model was estimated with ordinary least squares regression. All models controlled for the same covariates – family drinking, living arrangements, disposable income, religiosity, age of first drink, importance of fitness, age ethnicity, gender, communication about marketing

Table 37: Increasing influence of marketing on frequency of drinking as levels of interaction increase

Level of interaction	Type of marketing	Adjusted odds ratio	p-value
Passive	Exposure to marketing	1.08	< 0.01
Active	Engagement with marketing	1.16	< 0.001
Interaction with brand	Engagement with marketing online	1.17	< 0.001
Simultaneous interaction with brand and peers	Engagement with marketing in social media	1.28	< 0.001

Table 38: Increasing influence of marketing on frequency of drinking to get drunk as levels of interaction increase

Level of interaction	Type of marketing	Adjusted odds ratio	p-value
Passive	Exposure to marketing	Not significant	Not significant
Active	Engagement with marketing	1.07	< 0.01
Interaction with brand	Engagement with marketing online	1.07	< 0.05
Simultaneous interaction with brand and peers	Engagement with marketing in social media	1.16	< 0.01

Appendix I: Screenshots of questionnaire as it appeared for respondents

DIT Student Alcohol Survey 2012

Introduction - Please read carefully

This academic survey is designed to investigate **DIT student** attitudes towards alcohol consumption. Your participation is important and appreciated.

Please read the questions carefully. The survey should take only 10-12 minutes to complete without rushing.

This survey is completely **confidential and anonymous, so please answer honestly**.

You may opt out of the survey at any time without prejudice.

Following completion of the survey you may opt to enter a draw for an Apple iPad. **ONLY DIT students may complete this survey and enter the draw. Before claiming the prize, you will be required to show your DIT student card.**

For queries about this survey please contact Pat Kenny in the School of Marketing. Pat.Kenny@dit.ie

The survey has been approved by the DIT Research Ethics Committee. The committee may be contacted by emailing Raffaella.Salvante@dit.ie

Participants may complete the survey **only once**.

You must be over 18 to complete this survey.

By completing this survey, your consent to take part in this study is implied.

Note that once you have clicked on the CONTINUE button at the bottom of each page you cannot return to review or amend that page.

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DIT Student Alcohol Survey 2012

Do you drink alcohol?

There are slightly different versions of the survey for drinkers and for non-drinkers. Please complete the survey by following the relevant link below.

If you drink alcohol at all, please click the following link:
http://www.survey.bris.ac.uk/dit/studentdrinkers

If you do not drink alcohol at all and consider yourself to be a **complete non-drinker** please click the following link:
http://www.survey.bris.ac.uk/dit/studentnon-drinkers

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DIT Student Alcohol Survey 2012 - drinkers

If you drink alcohol, please click the CONTINUE button below to start the survey.

However, **if you are a non-drinker**, please complete a slightly different version of the survey at the following link:
http://www.survey.bris.ac.uk/dit/studentnon-drinkers

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DIT Student Alcohol Survey 2012 - drinkers

Some basic questions about you. Please answer all questions honestly. The survey is completely confidential and anonymous.

1. Which of the following best describes your living arrangements during the college term?

○ I live alone
○ I am living with parents/guardians
○ I am living away from family with other students
○ I am living with a spouse/partner
○ I am living with my children (either alone or with spouse/partner or with my parents)
○ I am living away from home in "digs" (renting a room in a house with strangers)
○ I am living away from home in a formal university residence run by a charity or religious institution
○ Other *(please specify)*:

2. Physical fitness.

	1 is NOT AT ALL IMPORTANT and 7 is OF EXTREME IMPORTANCE.						
	1	2	3	4	5	6	7
a. How important is your physical fitness to you?	○	○	○	○	○	○	○

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◯ I am living away from home in a formal university residence run by a charity or religious institution

◯ Other *(please specify)*:

---

2. Physical fitness.

	1 is NOT AT ALL IMPORTANT and 7 is OF EXTREME IMPORTANCE.						
	1	**2**	**3**	**4**	**5**	**6**	**7**
a. How important is your physical fitness to you?	◯	◯	◯	◯	◯	◯	◯

---

3. In general, my religious beliefs influence my decisions.

◯ Strongly agree
◯ Agree
◯ Disagree
◯ Strongly disagree
◯ I have no religious beliefs

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4. Please indicate your level of agreement by clicking on the relevant button.
This question is not specific to alcohol products.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
a. I rarely purchase the latest fashion styles until I am sure my friends approve of them	⊙	⊙	⊙	⊙	⊙
b. It is important that others like the products and brands I buy	⊙	⊙	⊙	⊙	⊙
c. When buying products, I generally purchase those brands that I think others will approve of	⊙	⊙	⊙	⊙	⊙
d. If other people can see me using a product, I often purchase the brand they expect me to buy	⊙	⊙	⊙	⊙	⊙
e. I like to know what brands and products make good impressions on others	⊙	⊙	⊙	⊙	⊙
f. I achieve a sense of belonging by purchasing the same products and brands that others purchase	⊙	⊙	⊙	⊙	⊙
g. If I want to be like someone, I often try to buy the same brands that they buy	⊙	⊙	⊙	⊙	⊙
h. I often identify with other people by purchasing the same products and brands they purchase	⊙	⊙	⊙	⊙	⊙
i. To make sure I buy the right product or brand, I often observe what others are buying and using	⊙	⊙	⊙	⊙	⊙
j. If I have little experience with a product, I often ask my friends about the product	⊙	⊙	⊙	⊙	⊙
k. I often consult other people to help choose the best alternative available from a product class	⊙	⊙	⊙	⊙	⊙
l. I frequently gather information from others about a product before I buy	⊙	⊙	⊙	⊙	⊙

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	1	2	3	4	5
i. To make sure I buy the right product or brand, I often observe what others are buying and using	○	○	○	○	○
j. If I have little experience with a product, I often ask my friends about the product	○	○	○	○	○
k. I often consult other people to help choose the best alternative available from a product class	○	○	○	○	○
l. I frequently gather information from others about a product before I buy	○	○	○	○	○

5. Please indicate how much you agree or disagree with the following statements.
Please leave blank if you do not have close friends or parents, respectively.

	1 is STRONGLY AGREE and 7 is STRONGLY DISAGREE.						
	1	2	3	4	5	6	7
a. When it comes to drinking alcohol, I generally **want to do** what my **close friends** want me to do.	○	○	○	○	○	○	○
b. When it comes to drinking alcohol, I generally **want to do** what my **parents** want me to do.	○	○	○	○	○	○	○

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DIT Student Alcohol Survey 2012 - drink...   +

Now please think about the different ways that alcohol is promoted these days

6. Please select which, if any, of the following activities **YOU have ever done**.
    (select all that apply)

    ☐ Received free samples of alcohol products.
    ☐ Received free gifts (e.g. hats, glasses, pens etc) showing alcohol brand logos, given out as part of a promotion.
    ☐ Received special price offers for alcohol.
    ☐ Received promotional mail or emails, or joke or chain emails mentioning alcohol brands.
    ☐ Passed on or forwarded promotional emails or joke or chain emails mentioning alcohol brands.
    ☐ Entered a competition organised by an alcohol brand.
    ☐ Owned clothing or other personal items with an alcohol brand name or logo on it.
    ☐ Looked at a website for alcohol brands or about drinking (excluding health related sites).
    ☐ Downloaded a mobile phone or computer screensaver containing an alcohol brand name or logo
    ☐ Downloaded a smartphone app featuring alcohol brands
    ☐ Played a computer game that features drinking or alcohol brands
    ☐ Watched online videos (YouTube etc) that show alcohol brands or show people drinking.
    ☐ Placed an alcohol brand or logo on your social media homepage (Facebook, Bebo etc).
    ☐ "Liked" an alcohol brand on Facebook.
    ☐ Followed an alcohol brand on Twitter.
    ☐ "Liked" a bar or nightclub on Facebook.
    ☐ Followed a bar or nightclub on Twitter.
    ☐ None of the above.

    Remember: There is no limit to how many options you can pick. Please pick all that apply.

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9. Please think about **the last week**.

	Please click the appropriate button for each question.	
	Yes	No
a. Have you seen **TV advertisements** for alcohol products in the last week?	○	○
b. Have you seen **outdoor** ads for alcohol, for example ads on **billboards, posters, bus shelters or on the sides of buses** in the last week?	○	○
c. Have you seen ads for alcohol in **newspapers and magazines** (including flyers and inserts) in the last week?	○	○
d. Have you seen **special price offers or promotions or happy hours** for alcohol in the last week?	○	○
e. Have you seen **signs or posters about alcohol in shop windows** in the last week?	○	○

10. Again, please think about your experience over **the last week**.

	Please click the appropriate button for each question.	
	Yes	No
a. Have you received **emails or chain emails or joke emails** that	○	○

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e. Have you seen **signs or posters about alcohol in shop windows** in the last week?

10. Again, please think about your experience over **the last week**.

	Please click the appropriate button for each question.	
	Yes	No
a. Have you received **emails or chain emails or joke emails** that mention alcohol brands in the last week?		
b. Have you seen **websites for alcohol brands** or **websites that have alcohol brand logos or names on them** (excluding health related sites) in the last week?		
c. Have you **watched online videos (e.g. YouTube etc)** about alcohol brands or about drinking in the last week?		
d. Have you **downloaded a mobile phone or computer screensaver** containing an alcohol brand name or logo in the last week?		
e. Have you **played a computer game or used a smartphone app** that features drinking or alcohol brands in the last week?		

11. Again, please think about **the last week**.

	Please click the appropriate button for each question.	
	Yes	No
a. Have you seen alcohol brand names or logos on **clothing or sports tops** (your own or others) in the last week?		

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week?

e. Have you **played a computer game or used a smartphone app** that features drinking or alcohol brands in the last week?	○	○

11. Again, please think about **the last week**.

	Please click the appropriate button for each question.	
	Yes	**No**
a. Have you seen alcohol brand names or logos on **clothing or sports tops** (your own or others) in the last week?	○	○
b. Have you seen **celebrities using alcohol in films, on TV or in music videos** in the last week?	○	○
c. Have you seen **TV programmes or films sponsored by alcohol brands** in the last week?	○	○
d. Have you seen **sponsorship of sports teams or sporting events** by alcohol brands (either live or on TV) in the last week?	○	○
e. Have you seen **sponsorship of music events, festivals, concerts or venues** by alcohol brands in the last week?	○	○

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12.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
a. If a student just decided not to drink alcohol on a weekend night out it would seem a bit strange.	○	○	○	○	○
b. I don't think there would be a problem socially, with myself being a non-drinker	○	○	○	○	○
c. If I were a non-drinker, I believe my friends would treat me differently	○	○	○	○	○
d. I would have just as much success with romantic/sexual partners if I were a non-drinker	○	○	○	○	○
e. I would find it very hard to enjoy my social life if I were a non-drinker	○	○	○	○	○
f. I think being a non-drinker would negatively affect my life	○	○	○	○	○
g. Non-drinkers don't know what fun they're missing	○	○	○	○	○
h. I think it is strange when students do not drink	○	○	○	○	○
i. I would hate to be a non-drinker	○	○	○	○	○
j. Spending time with drinkers is more fun than spending time with non-drinkers	○	○	○	○	○
k. Non-drinkers tend to be repressed	○	○	○	○	○
l. An evening with a non-drinker tends to be predictable	○	○	○	○	○

13. **This question is optional**. If you wish to make any comments about question 12 above, feel free to do so in the box below. *(Optional)*

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Some questions about alcohol consumption. Remember - the survey is completely anonymous, so please answer honestly.

14. Please think about how often you drink alcohol.

	Please include any amount, even 1 drink.						
	Never	About once a month	2-3 times a month	Once or twice a week	3-4 days a week	Nearly every day	Every day
a. How often do **you** normally drink alcohol?	○	○	○	○	○	○	○
b. How often do you think your **close friends** drink alcohol?	○	○	○	○	○	○	○
c. How often do you think the **average DIT student** drinks alcohol?	○	○	○	○	○	○	○
d. How often do you think the **average person your age in Ireland** drinks alcohol?	○	○	○	○	○	○	○

Note: If you have given up, or reduced, your drinking for Lent please answer in terms of your normal, non-Lenten drinking.

Drinking to get drunk

15. Now please think about **drinking to get drunk**.

	Never	About once a month	2-3 times a month	Once or twice a week	3-4 days a week	Nearly every day	Every day
a. How often do **you** normally drink to get drunk?	○	○	○	○	○	○	○
b. How often do you think your **close friends** drink to get drunk?	○	○	○	○	○	○	○
c. How often do you think the **average DIT student** drinks to get drunk?	○	○	○	○	○	○	○
d. How often do you think the **average person your age in Ireland** drinks to get drunk?	○	○	○	○	○	○	○

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Nearly there! After this page the remaining questions are very straightforward

Please think now about how you communicate with others.

17. *Please think about all of the different ways that you* **talk or communicate** *with your friends and siblings (including Twitter, Facebook, email, texting etc).*
How often do you talk or communicate with your friends or siblings **about drinking, planning a night out or having a laugh about a night out?**

- Almost always
- Often
- Sometimes
- Seldom
- Never

18. *Still thinking about all the different ways that you can talk and communicate with others or share stuff with others (including Twitter, Facebook, email, texting etc.)*
How often do you normally share, talk or communicate with your friends or siblings **about alcohol advertising or marketing campaigns?**

- Almost always
- Often
- Sometimes
- Seldom
- Never

Please think about drinking to get drunk on a WEEKEND night.

Never

Please think about drinking to get drunk on a WEEKEND night.

19. Please select a point on the scale where 1 is **Totally Acceptable** and 7 is **Totally Unacceptable**

	1 is TOTALLY ACCEPTABLE and 7 is TOTALLY UNACCEPTABLE						
	1	**2**	**3**	**4**	**5**	**6**	**7**
a. I believe that **drinking to get drunk at the weekend** is	○	○	○	○	○	○	○
b. Most DIT students think that drinking to get drunk at the **weekend** is	○	○	○	○	○	○	○
c. Most people my age in Ireland believe that drinking to get drunk at the **weekend** is	○	○	○	○	○	○	○

20. Still thinking about a typical **weekend** night out with friends.
Please leave the question blank if you do not have close friends or parents, respectively.

	1 is TOTALLY ACCEPTABLE and 7 is TOTALLY UNACCEPTABLE						
	1	**2**	**3**	**4**	**5**	**6**	**7**
a. My close friends believe that if I **personally** drank to get drunk at the weekend it would be	○	○	○	○	○	○	○
b. My parents believe that if I **personally** drank to get drunk at the weekend it would be	○	○	○	○	○	○	○

Now please think about drinking to get drunk on a WEEKDAY night

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Now please think about drinking to get drunk on a WEEKDAY night

21. Please think about a typical **weekday night** when you have to get up for college the next morning.

	1 is TOTALLY ACCEPTABLE and 7 is TOTALLY UNACCEPTABLE						
	1	2	3	4	5	6	7
a. I believe that **drinking to get drunk on a weekday night** is	○	○	○	○	○	○	○
b. Most DIT students think that drinking to get drunk on a **weekday night** is	○	○	○	○	○	○	○
c. Most people my age in Ireland think that drinking to get drunk on a **weekday night** is	○	○	○	○	○	○	○

22. Again, please think about a typical **weekday night** when you have to get up for college the next morning.
Please leave the question blank if you do not have close friends or parents, respectively.

	1 is TOTALLY ACCEPTABLE and 7 is TOTALLY UNACCEPTABLE						
	1	2	3	4	5	6	7
a. My close friends believe that if I **personally** drank to get drunk on a **weekday night** it would be	○	○	○	○	○	○	○
b. My parents believe that if I **personally** drank to get drunk on a **weekday night** it would be	○	○	○	○	○	○	○

Continue >

Survey testing only

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This is the 2nd last page of questions. The remaining questions are very straightforward.

Your family

23. Does your mother drink at all?

○ Yes
○ No
○ I'm not sure
○ Not applicable

24. Does your father drink at all?

○ Yes
○ No
○ I'm not sure
○ Not applicable

25. Do you have any brothers or sisters?

○ Yes
○ No

Do any of your brothers or sisters drink alcohol at all?

○ Yes
○ No
○ I'm not sure

A few more questions about you

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https://www.survey.bris.ac.uk/?manifestid=106606&op=preview

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DIT Student Alcohol Survey 2012 - drink... +

26. How old are you?

Select an answer ▼

27. Are you male or female?

○ Male
○ Female

28. What is your ethnic or cultural background?

○ Irish
○ Irish Traveller
○ Any other white background
○ African
○ Any other black background
○ Chinese
○ Any other Asian background
○ Other *(please specify)*:

29. In a typical week, after you have paid any bills, how much money would you usually have **available** to spend on going out to socialise?

○ €20 or less
○ €21-40
○ €41-60
○ €61-80
○ €81-100
○ €101-120
○ €121-140
○ More than €140

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27/02/2014

○ €21-40
○ €41-60
○ €61-80
○ €81-100
○ €101-120
○ €121-140
○ More than €140

*Please ensure that you have chosen **how much you COULD spend, NOT how much you ACTUALLY spend.***

30. How old were you when you had your first alcoholic drink (a full drink, not just a sip)?

○ I have never had a drink
○ 11 or younger
○ 12
○ 13
○ 14
○ 15
○ 16
○ 17
○ 18 or older

Continue >

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Check Answers & Continue >

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DIT Student Alcohol Survey 2012 - drink...

31. Including this academic year, how many years in total have you spent studying in DIT? (*Please treat part of a year as 1 year e.g. if this is your first year in DIT select 1 year, and so on*)

- ○ 1 year
- ○ 2 years
- ○ 3 years
- ○ 4 years
- ○ 5 years
- ○ 6 or more years

32. Have you studied in another college or university?

- ○ Yes
- ○ No

  If Yes, how many years have you spent studying elsewhere?
  - ○ 1 year
  - ○ 2 years
  - ○ 3 years
  - ○ 4 years
  - ○ 5 years
  - ○ 6 or more years

33. Are you an undergraduate or postgraduate student?

- ○ Undergraduate
- ○ Postgraduate

34. Are you a full time student or a part time student?

○ Full time
○ Part time

35. Are you studying for your finals (undergraduate or postgraduate) this year?

○ Yes
○ No

36. How did you hear about this survey?

○ Email from DIT administration
○ DIT Facebook page
○ DIT Twitter accout
○ Email from DITSU
○ DITSU Facebook page
○ DITSU Twitter account
○ Campus Life homepage
○ A leaflet or poster
○ Other *(please specify)*:

37. Which main DIT campus are you normally based in?

○ DIT Aungier Street
○ DIT Bolton Street
○ DIT Cathal Brugha Street
○ DIT Kevin Street
○ DIT Mountjoy Square

DIT Student Alcohol Survey 2012 - drinkers

Final Page

Thank you for taking part in this survey.

If you wish to enter the draw for the Apple iPad, please place the following unique code *f49K3ru9AfSHqvfCMaq4Rpa* in the subject line of an email and send it once only from your **DIT email account within the next 10 minutes** to **studentalcoholsurvey@gmail.com**. No other information is required in the email.

This unique code will not identify your responses which will remain both confidential and anonymous.

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Appendix II: Discussion of Research Propositions 4,5,6,7 & 8

II.1 Research Proposition 4: Consumption of alcohol marketing communications will be associated with negative attitudes towards non-drinkers

Despite regulatory prohibitions to the contrary, alcohol marketing frequently portrays alcohol consumption as a social lubricant and a gateway to social success (Dring and Hope, 2001). Similar appeals to the social benefits of drinking are found in "responsible" drinking advertising campaigns sponsored by the alcohol industry. Given the importance of positive outcome expectancies in influencing drinking-related behaviour (Jones, Corbin and Fromme, 2001), and the desire to avoid missing out on the benefits obtained by those who drink (Rimal and Real, 2005), it seems probable that alcohol marketing contributes towards the creation of negative attitudes towards non-drinkers.

Research Proposition 4 is tested with the following hypotheses:

- H4a: Increased exposure to alcohol marketing communications will be associated with more negative attitudes towards non-drinkers.

- H4b: Increased engagement with alcohol marketing communications will be associated with more negative attitudes towards non-drinkers.

- H4c: Increased engagement with online alcohol marketing communications will be associated with more negative attitudes towards non-drinkers.

II.2   Research Proposition 5: Social norm perceptions will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

Social norms act as a signal of "normal" behaviour (Lapinski and Rimal, 2005), especially in socially ambiguous contexts such as the transition to college life. If perceived social norms suggest that alcohol consumption is "normal", then it seems probable that non-drinkers will be perceived as "abnormal" or be associated with negative stereotypes. If social norm perceptions originate, in part, from perceptions created by alcohol marketing, then it is likely that social norm perceptions are an indirect path through which marketing creates negative attitudes towards non-drinkers.

Research Proposition 5 is tested with the following hypotheses:

- H5a: Perceived descriptive norms will partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

- H5b: Perceived injunctive norms will partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

II.3   Research Proposition 6: Descriptive and injunctive norms will be overestimated

The tendency to overestimate peer drinking norms is well established worldwide (Berkowitz, 2005), although there is considerably less work on the phenomenon of norm overestimation in a European setting. No published studies have been found which examine overestimations in an Irish context. Furthermore, while the original misperception study (Perkins and Berkowitz, 1986) examined attitudes towards alcohol, most misperception studies tend to be limited to descriptive norms (behaviours) and do not tend to examine misperceptions around injunctive norms (attitudes). Discovering a tendency to overestimate peer descriptive or injunctive norms in an Irish context would contribute to social norms theory as it would indicate a tendency to overestimate norms even in a heavier drinking culture.

Research Proposition 6 is tested with the following hypotheses:

- H6a: The perceived frequency of drinking amongst DIT students will be greater than the actual frequency of drinking amongst DIT students.

- H6b: The perceived frequency of drinking to get drunk amongst DIT students will be greater than the actual frequency of drinking to get drunk amongst DIT students.

- H6c: The perceived approval of DIT students about drinking to get drunk at the weekend will be higher than the actual approval of DIT students towards drinking to get drunk at the weekend

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- H6d: The perceived approval of DIT students about drinking to get drunk on weekdays will be higher than the actual approval of DIT students towards drinking to get drunk on weekdays

II.4   Research Proposition 7: Normative overestimations will partially mediate the influence of marketing on alcohol consumption

Research data suggests that normative perceptions have a stronger influence on behaviour than actual norms do (Perkins, Haines and Rice, 2005). In light of this, it seems probable that the tendency to overestimate the norm will be associated with higher levels of alcohol consumption. Similarly, it seems likely that marketing communications could contribute to the tendency to misperceive norms, and that marketing could indirectly influence behaviour through misperceptions. In other words – those who consume more alcohol marketing communications may be more likely to overestimate social norms around drinking and consequently may be more likely to drink alcohol with greater frequency.

Research Proposition 7 is tested with the following hypotheses:

- H7a: Overestimations of the descriptive norm will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol.

- H7b: Overestimations of the descriptive norm will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk.

- H7c: Overestimations of the injunctive norm will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk.

II.5   Research Proposition 8: Normative overestimations will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

If, as Research Proposition 7 suggests, normative overestimations mediate the relationship between alcohol marketing communications and alcohol consumption, then in a similar fashion they might also mediate the relationship alcohol marketing communications and negative attitudes towards non-drinkers. In other words – those who consume more alcohol marketing communications may be more likely to overestimate social norms around drinking and consequently may be more likely to perceive non-drinkers in a negative way.

Research Proposition 8 is measured with the following hypotheses:

- H8a: Overestimations of the descriptive norm will partially mediate the relationship between exposure to alcohol marketing communications and negative attitudes towards non-drinkers.

- H8b: Overestimations of the injunctive norm will partially mediate the relationship between exposure to alcohol marketing communications and negative attitudes towards non-drinkers.

Appendix III: Analysis of Research Propositions 4,5,6,7 & 8

III.1 Introduction

This appendix incorporates Research Propositions 4 – 8, and examines the relationship between marketing and negative attitudes towards non-drinkers (Research Proposition 4); the potential mediating role of normative perceptions in the relationship between marketing and negative attitudes towards non-drinkers (Research Proposition 5); the existence of normative misperceptions and overestimations (Research Proposition 6), as well as the potential role of misperceptions in mediating the relationship between alcohol marketing communications and personal alcohol consumption (Research Proposition 7) and negative attitudes towards non-drinkers (Research Proposition 8).

While these Research Propositions each make a new contribution to knowledge to a greater or lesser extent, they are labelled as secondary in nature and have been placed in the Appendix in order to allow a clearer focus on the core Research Propositions.

Each Research Proposition is examined with a series of regression analyses to test the underlying hypotheses.

II.2   Research Proposition 4: Consumption of alcohol marketing communications will be associated with negative attitudes towards non-drinkers

Alcohol marketing communications are not only associated with actual consumption patterns, but have also been found to shape attitudes and expectations around alcohol consumption (Austin and Knaus, 2000; Dring and Hope, 2001). One newly conceptualised dimension of alcohol expectancies relates to attitudes towards non-drinkers.

Regan and Morrison (2011, 2013) have pioneered new research which suggests that holding negative attitudes towards non-drinkers predicts alcohol consumption. The question then arises as to where negative attitudes towards non-drinkers originate from in the first instance? If alcohol marketing communications regularly portray drinkers as popular and successful (Hastings et al., 2010), then it may be the case that exposure to, or engagement with, alcohol marketing will be associated with negative attitudes towards non-drinkers. This research proposition is tested with three research hypotheses.

- H4a: Increased exposure to alcohol marketing communications will be associated with more negative attitudes towards non-drinkers

- H4b: Increased engagement with alcohol marketing communications will be associated with more negative attitudes towards non-drinkers

- H4c: Increased engagement with online alcohol marketing communications will be associated with more negative attitudes towards non-drinkers

II.2.1   Analytical strategy

All hypotheses were tested with hierarchical multiple regression conducted with IBM SPSS Version 20. Multiple regression was used in the analysis of Research Proposition 4 because the main outcome variable was measured on a continuous scale and met the necessary conditions for the use of ordinary least squares regression (see section 4.7 for a review of these requirements). Variables were entered in blocks. The RAND scale measuring attitudes towards non-drinkers is a very recently formulated scale (2011) and thus there were no prior studies on which to base the order of variable entry. Therefore, known predictors of alcohol consumption were entered in the same blocks as in Research Proposition 1: maternal, paternal and sibling drinking were entered in the first block; lifestyle factors – disposable income, living arrangements, dedication to fitness, religiosity and age of first drink were entered in the second block and the key demographic factors of age, sex and ethnicity were entered in the third block. Communication about marketing was entered in the fourth block, and the relevant marketing variable of interest was entered in the fifth and final block.

In previous analyses which examined the relationship between alcohol marketing communications and alcohol consumption, a variable measuring whether students were studying for finals or not was also entered into the models. This was done because there was a plausible argument that studying for important final exams could potentially limit the frequency of alcohol consumption or drunkenness. However, because there was no theoretically plausible relationship between studying for finals and attitudes towards non-drinkers, this variable was not included in models testing Research Proposition 4.

III.2.2 H4a: Increased exposure to alcohol marketing communications will be associated with more negative attitudes towards non-drinkers

A hierarchical multiple linear regression analysis was conducted to investigate the relationship between exposure to alcohol marketing communications in the past week, and attitudes towards non-drinkers, controlling for other likely predictors. See Table 18 for full details. The final model predicted only 9.8% of the variance in attitudes towards non-drinkers, but the overall model was still statistically significant (F = 8.852, df = 13, p < 0.001). Exposure to alcohol marketing communications within the past week was not a statistically significant predictor of negative attitudes towards non-drinkers (β = 0.30, p = 0.340).

The null hypothesis that there is no statistically significant association between exposure to alcohol marketing communications within the past week and negative attitudes towards non-drinkers is not rejected.

III.2.3 H4b: Increased engagement with alcohol marketing communications will be associated with more negative attitudes towards non-drinkers

A hierarchical multiple linear regression analysis was conducted to investigate the relationship between engagement with alcohol marketing communications and attitudes towards non-drinkers, controlling for other likely predictors. See Table 19 for full details. While the final model predicted only 11.3% of the variance in attitudes towards non-drinkers, the overall model was still statistically significant (F = 19.064, df = 13, p < 0.001). Engagement with alcohol marketing communications (β = 0.143, p < 0.001) was a statistically significant predictor of negative attitudes towards non-drinkers.

The null hypothesis that there is no statistically significant association between engagement with alcohol marketing communications and negative attitudes towards non-drinkers is rejected.

III.2.4 H4c: Increased engagement with alcohol marketing communications online will be associated with more negative attitudes towards non-drinkers

A hierarchical multiple linear regression analysis was conducted to investigate the relationship between engagement with alcohol marketing communications online and attitudes towards non-drinkers, controlling for other likely predictors. See Table 20 for full details. While the final model predicted only 10.7% of the variance in attitudes towards non-drinkers, the overall model was still statistically significant (F = 11.745, df = 13, p < 0.01). Engagement with alcohol marketing communications online (β = 0.108, p < 0.01) was a statistically significant predictor of negative attitudes towards non-drinkers.

The null hypothesis that there is no statistically significant association between engagement with alcohol marketing communications online and negative attitudes towards non-drinkers is rejected.

III.2.5 Interaction effects

Two further (unreported) multiple linear regression models were tested for possible interaction effects between engagement with alcohol marketing communications (online or otherwise) and communication about alcohol marketing. This was to test whether communication about alcohol marketing might enhance or amplify the association between alcohol marketing communications and negative attitudes towards non-drinkers. Interaction effects between communication about marketing and exposure to marketing within the past week were not tested as the latter variable was not significantly related to negative attitudes towards non-drinkers. There were no statistically significant interaction effects in any models. See Table 21 for further details.

III.2.6 Research Proposition 4: Conclusion

The data provides broad support for the proposition that engagement with alcohol marketing communications is associated with negative attitudes towards non-drinkers, and is consistent with prior research suggesting a link between alcohol marketing communications and pro-alcohol expectancies (Fleming, Thorson and Atkin, 2004; Marcoux and Shoppe, 1997; Norman, Bennett and Lewis, 1998). While the data is cross-sectional in nature, and does not establish causality, the notion that engagement with marketing leads to negative attitudes towards non-drinkers is considerably more plausible than the alternative reverse-causality explanation that a negative attitude towards non-drinkers encourages people to engage more with alcohol marketing communications.

Exposure to marketing communications within the past week was not associated with negative attitudes towards non-drinkers, when communication about marketing is controlled for. It is worth recalling that exposure to marketing within the last week and drinking to get drunk were also not significantly related (see 5.2.4). This may perhaps be explained by the specific construct in question – there may be weaknesses in the way in which exposure to marketing within the past week was measured or there may be insufficiencies in the recollection of respondents about weekly exposure. A more likely partial explanation is the fact that in both models (H1d and H4a), exposure to marketing was not statistically significant after having controlled for communication with peers about marketing, which was statistically significant in both cases – it may be that some of the influence of weekly exposure is accounted for via communication about said exposure with peers.

Communication about marketing was included in the models in order to check for an interaction effect with exposure to/engagement with marketing communications, such that communication with peers about alcohol marketing might accentuate the influence of marketing on alcohol related behaviours or attitudes. However, there were no statistically significant interaction effects, despite the importance of communication about marketing in all models predicting negative attitudes towards non-drinkers.

The regression models used to test Research Proposition 4 explained a relatively small amount of variance. However, this is not uncommon in social sciences when many other unmeasured factors are at play. This is even more likely to be the case in models involving a relatively new construct and scale which has not been the subject of much prior research.

It would appear that alcohol marketing may have a multitude of effects, not only by encouraging personal consumption, but potentially also by stigmatising non-consumption. This is not lost on alcohol marketers – themes of belonging and of camaraderie are common in alcohol advertising (Hastings et al., 2010). The need to belong is at its most potent when consumers are young and trying to find their own place in the world. It is not a coincidence that alcohol marketing, with all of its social appeals, is most influential with younger, inexperienced drinkers (Collins et al., 2007) and that social norms also exert a more powerful impact on young people in socially ambiguous and anxious situations (Neighbors et al., 2007a).

III.3   Research Proposition 5: Social norm perceptions will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

Analysis conducted for Research Proposition 4 suggests that engagement with alcohol marketing communications is significantly associated with negative attitudes towards non-drinkers. Furthermore, the analysis conducted for Research Proposition 3 suggests that social norm perceptions mediate the relationship between marketing and personal consumption. It therefore seems likely that social norm perceptions mediate the relationship between engagement with alcohol marketing and negative attitudes towards non-drinkers.

This proposition is tested with two main hypotheses:

- H5a: Perceived descriptive norms will partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.
- H5b: Perceived injunctive norms will partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

III.3.1   Analytical strategy

As with earlier hypotheses, both engagement with marketing and perceived descriptive norms of close friends will be used in the analyses as the marketing and social norms variables of interest, respectively. This ensures consistency with prior analysis. Both variables were the most significant relevant predictors in prior models.

Two different approaches were used to estimate mediation in Research Proposition 5. For H5a, the mediator is categorical in nature and the outcome variable is continuous. The Iacobucci (2012) method was adopted, as this approach allows for the estimation of indirect effects with a categorical mediator and a continuous outcome variable – it is sufficiently flexible to estimate indirect effects using different types of regression analyses (logistic and ordinary least squares) for different legs of the analyses. For H5b, a bootstrapping resampling approach (Bollen and Stine, 1990) was deemed more appropriate given the nature of the data for that analysis – a continuous mediator and outcome variable.

III.3.2 H5a: Perceived descriptive norms will partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

As there are two separate measures of perceived descriptive norms – perceived close friend frequency of drinking and perceived close friend drinking to get drunk – H5a is divided further into two separate sub-hypotheses.

- H5a(i): Perceived descriptive norms for frequency of drinking will partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

- H5a(ii): Perceived descriptive norms for frequency of drinking to get drunk will partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

<u>H5a(i): Perceived descriptive norms for frequency of drinking will partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.</u>

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

As outlined in Research Proposition 4, multiple linear regression indicated that there was a statistically significant relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers (β = 0.143, p < 0.001).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 22, there is a statistically significant association between engagement with alcohol marketing communications and perceived frequency of drinking by close friends (AOR = 1.13, p < 0.001).

Step 3: Establish that the mediator is significantly associated with the outcome variable, controlling for the main predictor

Multiple linear regression analysis (Table 22) showed that, controlling for engagement with alcohol marketing communications, there was not a statistically significant relationship between perceived frequency of drinking by close friends and negative attitudes towards non-drinkers (p = 0.233).

The mediation analysis terminates at this stage as it requires a significant relationship at each stage of the analysis.

The null hypothesis that perceived descriptive norms of drinking to get drunk do not mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers is not rejected.

<u>H5a(ii): Perceived descriptive norms for frequency of drinking to get drunk will partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.</u>

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

As outlined in Research Proposition 4, multiple linear regression indicated that there was a statistically significant relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers (β = 0.143, p < 0.001).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 23, there is a statistically significant association between engagement with alcohol marketing communications and perceived descriptive norms for frequency of drinking to get drunk (AOR = 1.06, p < 0.05).

Step 3: Establish that the mediator is significantly associated with the outcome variable, controlling for the main predictor

Multiple linear regression analysis (Table 23) showed that, controlling for engagement with alcohol marketing communications, there was a statistically significant relationship between perceived descriptive norms of drinking to get drunk and negative attitudes towards non-drinkers (β = 0.190, p < 0.001).

Step 4: Calculate the $Z_{Mediation}$ score

Using the parameter estimates and associated standard errors in Steps 2 and 3, $Z_{DescriptiveNormDrunk}$ = 2.33 (p < 0.05), indicating support for a significant mediation effect of perceived descriptive norms of drinking to get drunk on the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

The null hypothesis that there is no statistically significant mediating effect of perceived descriptive norms of close friends drinking to get drunk on the relationship between engagement with marketing and negative attitudes towards non-drinkers is rejected.

III.3.3 H5b: Perceived injunctive norms will partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

H5b involves a continuous mediator and continuous outcome variable. As such it is more appropriate to investigate mediation utilising a bootstrapping resampling strategy (Bollen and Stine, 1990) similar to that used when estimating H3c (see section 5.4.4). As with the former case, the PROCESS macro for IBM SPSS (Hayes, 2013) was used to estimate indirect effects with confidence intervals based on 5,000 samples. The same covariates used in other mediation models in Research Proposition 5 were included in this analysis.

The analysis revealed that there was a small but significant indirect effect of engagement with alcohol marketing communications on frequency of drinking to get drunk through perceived injunctive norms, b = 0.0014, 95% BC CI [0.0002, 0.0037]. More details are provided in Figure 8.

The null hypothesis that there is no statistically significant mediating effect of perceived injunctive norms on the relationship between engagement with marketing and negative attitudes towards non-drinkers is rejected.

III.3.4 Research Proposition 5: Conclusion

The data supports the hypothesis that perceived descriptive norms of close friends for frequency of drinking to get drunk, and perceived injunctive norms for approval of drinking to get drunk, partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers. The data did not support the hypothesis that perceived frequency of drinking mediated the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers – the association between perceived descriptive norms and negative attitudes towards non-drinkers was not statistically significant in this case.

While the data suggests that injunctive norms mediate the influence of marketing on negative attitudes towards non-drinkers, the size of the indirect effect, and the proximity of the lower confidence interval to zero, indicate that the effect is small in size. This is perhaps to be expected given the fact that injunctive norms are based on perceptions of distal reference groups, and would seem to further underline the fundamental importance of salience when considering the role of social norms.

It seems interesting that the data suggested a mediating role for perceived descriptive and injunctive norms relating to *drinking to get drunk* but not for perceived frequency of *drinking*. Perhaps it is the case that drinking to get drunk implies an element of fun or excitement which helps to predict negative attitudes towards those who do not drink at all in a way that merely drinking (without necessarily intending to get drunk) does not.

On the whole, the data supports a set of structural relationships whereby marketing contributes to the perception of more permissive behaviour and attitudes relating to alcohol consumption, and that these permissive normative perceptions in turn create negative attitudes towards non-drinkers. Given the cross-sectional nature of the study, causality cannot be established. However, an entirely reversed set of relationships, whereby negative attitudes towards non-drinkers predict normative perceptions and which in turn predict levels of engagement with marketing, seems conceptually untenable.

Research into the construct of negative attitudes towards non-drinkers, measured using the RANDS scale (Regan and Morrison, 2011, 2013), is at an early stage. While the RANDS scale seems to be a promising predictor of alcohol consumption, and in turn seems to be strongly predicted by engagement with alcohol marketing, more research is warranted in order to understand the complex sets of relationships at work.

III.4   Research Proposition 6: Descriptive and Injunctive norms will be overestimated

Prior research has established the existence of two similar, but different, ways in which normative misperceptions can be manifested. In the first instance, empirical research on alcohol consumption has demonstrated a tendency towards *self-other discrepancies*: a belief that others drink more than the respondents themselves do, and that the extent of self-other discrepancies increases as distance between the individual and the reference group increases (Baer, Stacey and Larimer, 1991). In the second instance, previous studies have also identified a pervasive pattern of *overestimation* of drinking behaviour, and approval of same, amongst peers (Franca et al., 2010; Kypri and Langley, 2003; Neighbors et al., 2007a; Yanovitsky et al., 2006).

Both of these phenomena - self-other discrepancies and overestimations - were tested in the present study through descriptive statistics and with the use of non-parametric methods to test for statistically significant differences between actual and perceived behaviour and attitudes.

III.4.1 Self-other discrepancies

The data reveals a persistent pattern of self-other discrepancies with respect to descriptive norms of both perceived frequency of drinking, and perceived frequency of drinking to get drunk, in relation to all reference groups (close friends, the average DIT student and the average person of the same age in Ireland). Similar self-other discrepancies were found in terms of injunctive norms of perceived acceptability of drinking to get drunk on weekends and on weekdays. On almost all measures, most respondents believed that close friends, DIT students and the average person of the same age drank alcohol, and drank to get drunk, with greater frequency than they themselves did, and that each of the reference groups also held more permissive attitudes towards drinking to get drunk than they themselves did.

46.8% of respondents perceived that their close friends drank more frequently than they themselves did, whereas only 3.4% perceived that they drank more frequently than their friends. Similarly, 63.4% believed that they drank less frequently than the average DIT student while only 5.2% believed that they drank more frequently than the average DIT student. The corresponding figures for the average person of the same age were very similar – 62.2% believed that they drank less frequently than the average person of the same age, while only 5.8% believed that they drank more often than their average same age peer. A complete breakdown can be found in Table 24.

A similar pattern of believing oneself to be more abstemious than peers can be found in relation to perceptions of frequency of drinking to get drunk. 52.3%, 71% and 70% of respondents believed that they drank to get drunk less frequently than their close friends,

the average DIT student and the average person of the same age, respectively. Similarly, only 0.9% believed that they drank to get drunk more often than their close friends. The corresponding percentages who believed that they drank to get drunk more frequently than the average DIT student and the average person of the same age were 2.3% and 3.4%, respectively. A complete breakdown of responses can be found in Table 25.

Similar patterns of perceiving peers to be more permissive were also evident in relation to attitudes towards drinking to get drunk. A majority of respondents (53.6% and 56.3% respectively) believed that the average DIT student and the average person of the same age held more permissive attitudes towards drinking to get drunk on the weekends, whereas only 8% believed that either reference group had more conservative attitudes than they themselves did. Slightly greater self-other discrepancies are evident in relation to drinking to get drunk on weekdays, with 61.7% believing that the average DIT student had a more permissive attitude and 60% believing that the average person of the same age had a more permissive attitude, with only 6.7% and 8.7% respectively believing that DIT students or the average same-age peer had more conservative attitudes than they themselves had. A complete breakdown can be found in Tables 26 and 27.

The pattern of self-other discrepancies is illustrated graphically in a series of grouped bar charts (Figures 9-18). In each grouped bar chart, the relevant personal drinking behaviour or attitude is mapped against the corresponding perceived behaviour or attitude of one of the other reference groups. A clear pattern emerges from these diagrams – on the whole, perceived drinking behaviours and attitudes are more permissive than self-reported

personal behaviours and attitudes, and the extent of perceived self-other discrepancies increases as social distance from the respondent increases.

III.4.2 Normative misperceptions

As previously noted, researchers have identified a pervasive tendency by individuals to misperceive, and specifically to overestimate, the norm for alcohol consumption amongst their peers. The same tendency to overestimate the college peer norm for alcohol consumption, and for the approval of drinking to get drunk, was evident in the present study.

It is not possible to calculate misperceptions about close friends or the average person of the same age in Ireland in the absence of an appropriate representative sample of either reference group. However, by taking an average of personal behaviour and attitudes for each respondent, it is possible to approximate the actual norm for drinking behaviour and attitudes within the DIT student body.

The standard approach adopted in prior literature is to calculate the average based on a measure of the median frequency or quantity of alcohol consumption (Campo, Brossard and Frazer, 2003; McAlaney and McMahon, 2007, Perkins et al., 1999). Perkins et al (2010) argue that the use of the median is superior to the use of the mean as a measure of central tendency when assessing misperceptions as the median is a value that respondents can *actually* select when estimating perceived norms – the use of the mean as a measure of central tendency risks overstating the level of misperception within the sample.

The existence of misperception was established by subtracting actual campus norms (for descriptive norms: the median value for self-reported behaviour; for injunctive norms: the

median value for personal attitudes) from perceived campus norms (respondent estimations of the average DIT student's behaviour or attitude, as appropriate) (Lally, Bartle and Wardle, 2011).

In the present study, it is possible to test for misperceptions relating to 2 perceived descriptive norms (frequency of drinking and frequency of drinking to get drunk) and 2 perceived injunctive norms (approval of drinking to get drunk on weekends and approval of drinking to get drunk on weekdays).

61.6% of respondents correctly estimated the DIT norm for frequency of drinking. 5.6% of respondents underestimated the norm, while 32.8% of respondents overestimated the norm for frequency of drinking alcohol. A significantly greater pattern of misperception and overestimation was evident in relation to frequency of drinking to get drunk. 21.4% of respondents accurately perceived that the average DIT student drinks to get drunk 2-3 times per month. 6.1% thought that the average DIT student drank to get drunk less frequently than this, whereas 72.5% overestimated the frequency with which their peers drank in order to get drunk.

Similar patterns of gross overestimation of the norm were evident in relation to attitudes towards drinking. On an acceptability scale from 1 to 7, where 1 was totally unacceptable and 7 was totally acceptable, the average DIT student scored drinking to get drunk on the weekends as a 5 out of a maximum of 7. In other words, drinking to get drunk on the weekends was generally seen as very acceptable.   Notwithstanding this already permissive norm, 61.7% of respondents overestimated the norm of acceptability amongst

their college peers, and 29.7% felt that the average DIT student thought that deliberately drinking to get drunk on the weekend was totally acceptable (7 out of 7). 20.9% of respondents accurately assessed the norm, and only 17.4% underestimated the norm and thought that it was more conservative than it actually was.

This pattern of responses was also evident in relation to deliberately drinking to get drunk on weekdays – a rather extreme and intentional form of binge drinking. The actual norm campus norm for this behaviour was 4 out of 7 on a scale of acceptability, and only 15.5% of respondents accurately perceived the acceptability of this behaviour amongst their college peers. 11.2% underestimated the acceptability of this form of drinking, while a substantial 73.3% overestimated the acceptability of drinking to get drunk on weekdays within the DIT student community, with 16.3% perceiving that their fellow students rated this as "totally acceptable".

A complete overview of all statistics relating to misperception of the DIT norm for drinking behaviours (descriptive norms) and attitudes (injunctive norms) can be found in Table 28.

Following the approach adopted by Neighbors et al. (2006), a series of tests were conducted to establish if the differences between perceived and actual norms were statistically significant and to test a series of hypotheses that students would overestimate social norms amongst their peers. Actual and perceived alcohol consumption frequencies were measured on an ordinal scale, for which a Wilcoxon test is more appropriate than the equivalent t-test (Miles and Banyard, 2007; Wilcoxon, 1945). Personal approval of drinking

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to get drunk at the weekends, $D(1,071) = 0.15$, $p < 0.05$, and personal approval of drinking to get drunk on weekdays, $D(1,071) = 0.143$, $p < 0.05$, were measured on Likert type scales, but the distribution was significantly non-normal in both instances, thus also justifying the use of the Wilcoxon approach with these measures. Monte Carlo testing was employed to test for significance due to the large sample size (Field, 2005).

III.4.3 H6a: The perceived frequency of drinking amongst DIT students will be greater than the actual frequency of drinking amongst DIT students.

The actual campus descriptive norm for frequency of drinking was 1.5 times per week. The perceived median weekly frequency of drinking by the average DIT student was 1.5 times per week (quartiles 1.5; 1.5). The difference was statistically significant, Wilcoxon T= 60, z= -17.845, p < 0.001. The direction of the ranks on which the test statistics were based implied that perceived frequency of drinking to get drunk by the average DIT student was higher than actual frequency of drinking amongst DIT students. Notwithstanding the fact that the actual and perceived median frequency of drinking was the same (because 61.6% correctly identified the norm in this case), there was still a significant pattern of overestimation.

The null hypothesis that there is no statistically significant overestimation of the descriptive norm of drinking frequency amongst DIT students is rejected.

III.4.4 H6b: The perceived frequency of drinking to get drunk amongst DIT students will be greater than the actual frequency of drinking to get drunk amongst DIT students.

The actual campus descriptive norm for frequency of drinking to get drunk was 2-3 times per month (0.625 times per week). The perceived median weekly frequency of drinking to get drunk by the average DIT student was 1.5 times per week (quartiles 0.625; 1.5). The difference was statistically significant, Wilcoxon T= 65, z= -26.317, p < 0.001. The direction of the ranks on which the test statistics were based implied that perceived frequency of drinking to get drunk by the average DIT student was higher than actual frequency of drinking to get drunk amongst DIT students.

The null hypothesis that there is no statistically significant overestimation of the descriptive norm of frequency of drinking to get drunk amongst DIT students is rejected.

III.4.5 H6c: The perceived approval of DIT students about drinking to get drunk at the weekend will be higher than the actual approval of DIT students towards drinking to get drunk at the weekend

The actual campus injunctive norm for approval of drinking to get drunk at the weekend was 5 on a Likert-type scale from 1 to 7 (where 1 is totally unacceptable and 7 is totally acceptable). The perceived approval for drinking to get drunk on the weekend by the average DIT student was 6 out of 7 (quartiles 5; 7). The difference was statistically significant, Wilcoxon T= 186, z= -15.52, p < 0.001. The direction of the ranks on which the test statistics were based implied that perceived approval of drinking to get drunk on the weekend by the average DIT student was higher than actual approval of drinking to get drunk on the weekend by DIT students.

The null hypothesis that there is no statistically significant overestimation of the injunctive norm of approval of frequency of drinking to get drunk at the weekend amongst DIT students is rejected.

III.4.6 H6d: The perceived approval of DIT students about drinking to get drunk on weekdays will be higher than the actual approval of DIT students towards drinking to get drunk on weekdays

The actual campus injunctive norm for approval of drinking to get drunk on a weekday was 4 on a Likert-type scale from 1 to 7 (where 1 is totally unacceptable and 7 is totally acceptable). The perceived approval for drinking to get drunk on a weekday by the average DIT student was 5 out of 7 (quartiles 4; 6). The difference was statistically significant, Wilcoxon T= 120, z= -21.052, p < 0.001. The direction of the ranks on which the test statistics were based implied that perceived approval of drinking to get drunk on a weekday by the average DIT student was higher than actual approval of drinking to get drunk on a weekday by DIT students.

The null hypothesis that there is no statistically significant overestimation of the injunctive norm of approval of frequency of drinking to get drunk on a weekday amongst DIT students is rejected.

III.4.7 Research Proposition 6: Conclusion

Data analysis confirms Research Proposition 6 and its supporting hypotheses. The data reveals a consistent pattern of (i) self-other discrepancies for all reference groups and (ii) gross overestimation of the norm within the DIT student body. One third of students overestimated the descriptive norm for the frequency of drinking alcohol; in all other cases a significant majority of students overestimated the descriptive norm for the frequency of drinking to get drunk and the injunctive norms for approval of drinking to get drunk both at the weekend and on weekdays.

These findings are consistent with prior research on social norms misperceptions outlined in the literature review. Originating with Perkins and Berkowitz (1986), who were the first to uncover the misperception phenomenon, much of this research has been conducted with university students within the United States. However, more recent work has confirmed the existence of normative overestimations in other cultural contexts including the United Kingdom (Bewick et al., 2008; McAlaney and McMahon, 2007), France (Franca et al., 2010), Denmark (Balvig and Holmberg, 2011), Eastern Europe (Page et al., 2008) and Australia (Hughes et al., 2008). By documenting the existence of normative misperceptions within an Irish student sample, this research adds one more country to the growing list of those where misperceptions have been documented.

The existence of misperceptions is a fundamental pre-requisite for utilising social norms marketing techniques to bring about behaviour change. However, this research does not offer unequivocal support for using social norms theory with Irish students. The relative unimportance of DIT students compared to close friends in the earlier analyses (see

Research Proposition 2) suggests caution in this regard. The practical implications of this research for downstream applications of social norms theory in Ireland are discussed in Chapter 6.

III.5   Research Proposition 7: Normative overestimations will partially mediate the influence of marketing on alcohol consumption

As previously outlined, the data provides evidence to support the hypothesis that descriptive norm perceptions are associated with drinking related behaviour (Research Proposition 2), and that descriptive and injunctive norm perceptions may also partly mediate the relationship between engagement with alcohol marketing communications and personal drinking behaviour (Research Proposition 3). Further, the data also supports the hypothesis that there is a pattern of pervasive and extensive overestimation of the norm amongst college peers (Research Proposition 6).

What, then, of the impact of normative *misperceptions* on behaviour? It seems clear from the international literature that it is the *perception* of peer behaviour, and not necessarily the *reality* of that behaviour, that exerts most influence on personal behaviour (Nagoshi, 1999; Perkins, 2003). Where do such misperceptions of the norm come from? Might they originate in part from the impact of marketing and be embedded in a complex set of relationships through which they provide an indirect pathway for the influence of an array of cultural media, and specifically marketing, on behaviour? Research Proposition 7 attempts to address these questions.

This research proposition is tested with three hypotheses:

- H7a: Overestimations of the descriptive norm will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol.

- H7b: Overestimations of the descriptive norm will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk.

- H7c: Overestimations of the injunctive norm will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk.

III.5.1 Analytical strategy

Prior to examining these hypotheses, the question arises as to the appropriateness of utilising a measure of *misperception* of *college* peer norms when we have seen in Research Proposition 2 that *perceptions* of *college* peer norms are not significantly related to consumption when perceived *close friend* norms are controlled for in the statistical analysis. There are three substantial arguments that seem to justify doing so.

The first argument is one of necessity. As previously discussed in the methodology chapter, in line with much prior research, the present dataset only allows for the calculation of normative misperceptions relating to college peers. The only way around this would be to interview all close friends of all respondents. It seems probable that close friends may often be found outside of the college setting, and perhaps even in different geographic locations. The cost, and in particular the logistical complexity, of such an undertaking would appear to make it prohibitive. Intrepid researchers who might consider undertaking this task are likely to adopt a social network analysis perspective

and to study a large number of individual "egocentric networks" using specialist network mapping software programmes (Wasserman and Faust, 1994). Suffice it to say that the investigation and analysis of misperceptions amongst close friends is a complex and costly technique that is beyond the scope of this thesis.

The second is an argument from precedent. A substantial number of prior researchers have examined misperceived college peer norms, very often without reference to other, more proximal, peer norms (for a review see John and Alwyn, 2010).

The third is an argument from logic. There are pervasive patterns of normative overestimations amongst college peers. While we do not have data about misperceptions for other reference groups, it has been argued that students are likely to overestimate drinking norms for all reference groups, even if the extent of that misperception is smaller for more proximal reference groups than for more distal ones (Borsari and Carey, 2003). It therefore seems reasonable to argue that overestimations of college peer norms act as a kind of proxy for the overestimation of norms for other reference groups. If one is to overestimate norms for one group, it seems consistent with social norms theory that one is likely to be inclined to overestimate norms for all other reference groups as well, even though the extent of the overestimation may vary with each reference group. The data surrounding self-other discrepancies discussed in Research Proposition 6 provides some support for this argument. The data shows that 46.8% of respondents perceived that their close friends drank more frequently then they themselves did. Similarly, 52.3% perceived that their close friends drank to get drunk more frequently than the respondents did. While this does not of itself prove that the perceived norms for close friends were actually

overestimated, the existence of such self-other discrepancies, especially with a proximal reference group of this nature, strongly suggests the existence of overestimations for all reference groups.

Based on the foregoing, the analysis was conducted by utilising dichotomous variables that measured whether students overestimated DIT descriptive or injunctive norms. The Iacobucci (2012) methods of estimating mediation significance with categorical variables was also utilised as per prior mediation analyses.

III.5.2 H7a: Overestimations of the descriptive norm will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol.

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

Logistic regression analysis previously conducted for H1b has established that the relationship between engagement with marketing communications and personal frequency of drinking is statistically significant (AOR = 1.16, p < 0.001).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 29, there is a statistically significant association between engagement with alcohol marketing communications and overestimating frequency of drinking amongst college peers (AOR = 1.05, p < 0.05).

Step 3: Establish that the mediator is significantly associated with the outcome variable, controlling for the main predictor

Logistic regression analysis (Table 29) showed that, controlling for engagement with alcohol marketing communications, there is a statistically significant relationship between overestimating college peer norms and personal frequency of drinking (AOR = 2.157, p < 0.001).

Step 4: Calculate the $Z_{Mediation}$ score

Using the parameter estimates and associated standard errors in Steps 2 and 3, $Z_{DescriptiveNormDrink}$ = 2.048 (p < 0.05), indicating support for a significant mediation effect of college peer normative overestimations on the relationship between engagement with alcohol marketing communications and personal frequency of drinking.

The null hypothesis that overestimated descriptive norms for frequency of drinking does not mediate the relationship between engagement with alcohol marketing communications and personal frequency of drinking is rejected.

III.5.3 H7b: Overestimations of the descriptive norm will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk.

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

The analysis reported for H1b has established that the relationship between engagement with marketing communications and personal frequency of drinking to get drunk is statistically significant (AOR = 1.07, p < 0.01).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 30, there is not a statistically significant association between engagement with alcohol marketing communications and overestimating frequency of drinking to get drunk amongst college peers (p = 0.522).

Each step of the regression analyses must yield a significant relationship in order for mediation to exist, thus the analysis of H7b is terminated at this stage.

The null hypothesis that overestimated descriptive norms for frequency of drinking to get drunk does not mediate the relationship between engagement with alcohol marketing communications and personal frequency of drinking to get drunk is not rejected.

III.5.4 H7c: Overestimations of the injunctive norm will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk.

There are two variables measuring the overestimation of injunctive norms (overestimating injunctive norms for drinking on the weekend and on the weekday). Because combining these variables was not feasible, it is necessary to test H7c with two sub-hypotheses, each of which looks at a different type of injunctive norm overestimation.

- H7c(i): Overestimations of the injunctive norm for drinking to get drunk on the weekend will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk.
- H7c(ii): Overestimations of the injunctive norm for drinking to get drunk on weekdays will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk.

<u>H7c(i): Overestimations of the injunctive norm for drinking to get drunk on the weekend will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk.</u>

Step 1: Establish if there is a statistically significant association between the main predictor and the main outcome variable.

Logistic regression analysis previously conducted for H1b has established that the relationship between engagement with marketing communications and personal frequency of drinking to get drunk is statistically significant (AOR = 1.07, $p < 0.01$).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 31, there is not a statistically significant association between engagement with alcohol marketing communications and overestimating the acceptability of drinking to get drunk on weekends amongst college peers ($p = 0.177$).

Each step of the regression analyses must yield a significant relationship in order for mediation to exist, thus the analysis of H7c(i) is terminated at this stage.

The null hypothesis that overestimated injunctive norms for acceptability of drinking to get drunk on weekends does not mediate the relationship between engagement with alcohol marketing communications and personal frequency of drinking to get drunk is not rejected.

H7c(ii): Overestimations of the injunctive norm for drinking to get drunk on weekdays will partially mediate the relationship between alcohol marketing communications and frequency of drinking alcohol to get drunk.

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

Logistic regression analysis previously conducted for H1b has established that the relationship between engagement with marketing communications and personal frequency of drinking to get drunk is statistically significant (AOR = 1.07, $p < 0.01$).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 32, there is a statistically significant association between engagement with alcohol marketing communications and overestimating the acceptability of drinking to get drunk on weekends amongst college peers (AOR = 1.08; $p < 0.05$).

Step 3: Establish that the mediator is significantly associated with the outcome variable, controlling for the main predictor

Logistic regression analysis (Table 32) showed that, controlling for engagement with alcohol marketing communications, there is a statistically significant relationship between overestimating the acceptability of drinking to get drunk on weekdays amongst college peer norms and personal frequency of drinking to get drunk (AOR = 1.793, $p < 0.01$).

Step 4: Calculate the $Z_{Mediation}$ score

Using the parameter estimates and associated standard errors in Steps 2 and 3, $Z_{\text{InjunctiveNorms}} = 2.134$ ($p < 0.05$), indicating support for a significant mediation effect of overestimating college peer's acceptance of drinking to get drunk on weekdays on the relationship between engagement with alcohol marketing communications and personal frequency of drinking to get drunk.

The null hypothesis that overestimated injunctive norms for acceptability of drinking to get drunk on weekdays does not mediate the relationship between engagement with alcohol marketing communications and personal frequency of drinking to get drunk is rejected.

III.5.5 Research Proposition 7: Conclusion

The data provides mixed evidence in relation to the role of overestimated college peers norms in mediating the relationship between engagement with alcohol marketing communications and personal drinking behaviour. There is evidence consistent with a mediating relationship for overestimated norms for (i) frequency of drinking and (ii) for the acceptability of drinking to get drunk on *weekdays*. Meanwhile, the data does not indicate support for the proposition that overestimated norms for frequency of drinking to get drunk, or for the acceptability of drinking to get drunk on *weekends*, mediate the relationship between engagement with alcohol marketing communications and personal alcohol consumption.

Interpreting these findings is made somewhat more complex because there is evidence to support a mediation hypothesis for only *one* type of descriptive norm overestimation and only *one* type of injunctive norm overestimation.

In theory, the data supports the hypothesis of a relationship whereby engagement with alcohol marketing creates a false impression of the frequency, and acceptability, with which college peers drink and/or drink to get drunk. The process by which this mediating process might occur is readily evident – marketing provides clues as to the behaviours and the attitudes of others (Chia and Gunther, 2006; Chen et al., 2008). The ubiquity and content of alcohol marketing communications may be such that it acts as a carrier of misperception, creating a "reign of error" (Perkins, 1997) in which alcohol-related behaviours are normalised – and indeed glorified – leading individuals to overestimate how often college peers drink and how much they approve of drinking to get drunk. One

of the consequences of this overestimation of peer norms is that individuals consume more alcohol themselves.

The conceptual underpinnings for the supported mediating relationships are fairly self-evident. But what of the two mediating relationships that were not supported? How can they be explained?

A neat conceptual explanation for the non-mediating relationships is not immediately apparent, and it is evident that further research is warranted on this point. In both instances, the mediation analysis was terminated when it emerged that there was no statistically significant relationship between engagement with marketing communications and an overestimation of the norm in question. Is there something specific about (i) overestimating the frequency of *drinking to get drunk* (as opposed to simply overestimating the *frequency of drinking*), and (ii) overestimating approval for drinking to get drunk on *weekends* (as opposed to drinking to get drunk on *weekdays*) that makes them immune to the influence of marketing?

The average DIT student drank to get drunk 2-3 times per month. Yet 72.5% of respondents overestimated the norm for drinking to get drunk amongst their college peers, and a relatively sizeable minority (26.6%) of respondents actually drank to get drunk once per week or more. Does the pattern of overestimation, and in particular the pattern of frequency of drinking to get drunk, provide some clues about the lack of a significant relationship between alcohol marketing communications and overestimations of the norm?

When considering misperceived norms, it is important to distinguish between different types, and cognitive motivations, for misperceptions. Perhaps the most common form of misperception stems from *pluralistic ignorance* (Berkowitz, 2004; Prentice and Miller, 1993). In the case of alcohol consumption, this occurs when individuals perceive that others drink, or approve of drinking, more than they actually do. Perkins (2003) argues that such misperceptions stem from a range of environmental factors, including the cultural media.

But an alternative type of misperception is that of *false consensus*. In the context of alcohol consumption, it occurs when heavy drinking individuals are motivated to perceive others as heavy drinkers like themselves (Ross, Greene and House, 1977), though sometimes perhaps even as heavier drinkers than they themselves are (Perkins et al., 2005). It could be argued that false consensus involves to a certain extent a *reverse causal process* from that of the more traditional pluralistic ignorance form of misperception. While environmental factors may play a role in causing such misperceptions, it may be the case that heavier drinkers overestimate drinking norms primarily in an attempt to justify their own heavy consumption (Berkowitz, 2004). Whatever environmental factors are at work may be subsumed within a more powerful alternative cognitive process whereby heavy drinking individuals who frequently drink to get drunk are motivated by a process of self-justification to perceive that others are similar to themselves, or even "worse" than themselves.

This explanation seems more plausible when one examines the pattern of overestimation of the norm for frequency of drinking. The average student drank once per week, and in

general they also perceived that the average DIT student drank with this same frequency. Compared with DIT norms for drinking to get drunk, which were overestimated by almost three quarters of respondents, the norm for frequency of drinking amongst DIT students was overestimated by only 32.8% of students. The tendency to overestimate frequency of drinking was significantly associated with engagement with marketing communications – each extra form of marketing communications with which respondents had engaged increased the odds of overestimating the norm by 5%. It may be the case that, for the extreme behaviour (in public health terms) of drinking to get drunk, a significant minority who frequently drink to get drunk have overestimated norms based on the process of false consensus, and are motivated to overestimate peer behaviour not by environmental factors such as marketing, but by an internal process of self-justification. On the other hand, the relatively less problematic behaviour of drinking frequency may be characterised by the more traditional misperception process of pluralistic ignorance, whereby the propensity to misperceive is motivated by environmental factors, including marketing.

In the statistical models, each form of engagement with alcohol marketing communications makes it 8% more likely that respondents would overestimate injunctive norms for drinking to get drunk on weekdays. There is no immediate explanation as to why this relationship was significant when there was no significant relationship between engagement with marketing and overestimated injunctive norms for drinking to get drunk on weekends. It cannot be excluded that some of the discrepancies may be due to the novel measure of frequency of drinking to get drunk, which has not previously been used in the literature. Ultimately, the relationships involved are as yet imperfectly

understood, and there is a need for more research, particularly of a qualitative nature, to understand this complex and confusing set of interactions.

In any event, whatever the reason the non-mediating relationships, the analysis of H7a and H7c(ii) indicate that there is evidence consistent with the proposition that overestimated drinking frequency and overestimated approval of drinking to get drunk provide an indirect pathway for the influence of marketing on behaviour.

III.6   Research Proposition 8: Normative overestimations will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

Research Proposition 4 has indicated that engagement with alcohol marketing communications is associated with negative attitudes towards non-drinkers and Research Proposition 5 has suggested that perceived norms partially mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers. Furthermore, Research Proposition 7 provides some support for the notion that overestimations of college peer norms partially mediate the relationship between engagement with alcohol marketing communications and personal alcohol consumption. It seems reasonable to presume that overestimations of the norm could also mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

Research Proposition 8 is measured with the following 2 hypotheses:

- H8a: Overestimations of the descriptive norm will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

- H8b: Overestimations of the injunctive norm will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

The rationale for the use of college peer overestimations was discussed in detail in Research Proposition 7 and also applies here.

III.6.1 H8a: Overestimations of the descriptive norm will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

There are two types of descriptive norm overestimation – overestimating the frequency of drinking and overestimating the frequency of drinking to get drunk. H8a will be tested with two sub-hypotheses – one using overestimations of the norm for frequency of drinking as the mediator and the other using overestimations of the norm for frequency of drinking to get drunk.

- H8a(i): Overestimations of the descriptive norm for frequency of drinking will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

- H8a(ii): Overestimations of the descriptive norm for frequency of drinking to get drunk will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

H8a(i): Overestimations of the descriptive norm for frequency of drinking will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

As outlined in Research Proposition 4, multiple linear regression indicated that there was a statistically significant relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers (β = 0.143, p < 0.001).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 33, there is a statistically significant association between engagement with alcohol marketing communications and overestimating the frequency of drinking amongst college peers (AOR = 1.05; p < 0.05).

Step 3: Establish that the mediator is significantly associated with the outcome variable, controlling for the main predictor

Multiple linear regression analysis (Table 33) showed that, controlling for engagement with alcohol marketing communications, there was not a statistically significant relationship between overestimating the frequency of drinking amongst college peer norms and personal negative attitudes towards non-drinkers (p = 0.280).

The mediation analysis terminates at this point due to the non-significance of the relationship between the mediator and the outcome variable.

The null hypothesis that overestimated descriptive norms for frequency of drinking do not mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers is not rejected.

<u>H8a(ii): Overestimations of the descriptive norm for frequency of drinking to get drunk will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers</u>

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

As outlined in Research Proposition 4, multiple linear regression indicated that there was a statistically significant relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers (β = 0.143, p < 0.001).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 34, there is a not a statistically significant association between engagement with alcohol marketing communications and overestimating the frequency of drinking to get drunk amongst college peers (p = 0.507).

The mediation analysis terminates at this point due to the non-significance of the relationship between the mediator and the main predictor variable.

The null hypothesis that overestimated descriptive norms do not mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers is not rejected.

III.6.2 H8b: Overestimations of the injunctive norm will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

As with H8a, this hypothesis is broken into 2 sub-hypotheses due to the existence of two variables measuring overestimations of the injunctive norm, namely acceptability of drinking to get drunk on weekends and acceptability of drinking to get drunk on weekdays.

- H8b(i): Overestimations of the injunctive norm for drinking to get drunk at the weekend will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

- H8b(ii): Overestimations of the injunctive norm for drinking to get drunk on weekdays will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers

<u>H8b(i): Overestimations of the injunctive norm for drinking to get drunk at the weekend will partially mediate the relationship between alcohol marketing communications and negative attitudes towards non-drinkers</u>

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

As outlined in Research Proposition 4, multiple linear regression indicated that there was a statistically significant relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers (β = 0.143, $p < 0.001$).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 35, there is a not a statistically significant association between engagement with alcohol marketing communications and overestimating the injunctive norm for drinking to get drunk on weekends amongst college peers ($p = 0.151$).

The mediation analysis terminates at this point due to the non-significance of the relationship between the mediator and the main predictor variable.

The null hypothesis that overestimated injunctive norms for drinking to get drunk at the weekend do not mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers is not rejected.

Step 1: Establish that there is a statistically significant association between the main predictor and the main outcome variable.

As outlined in Research Proposition 4, multiple linear regression indicated that there was a statistically significant relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers (β = 0.143, p < 0.001).

Step 2: Establish that the main predictor is significantly associated with the mediator

As outlined in the summary in Table 36, there is a statistically significant association between engagement with alcohol marketing communications and overestimating the frequency of drinking to get drunk on weekdays amongst college peers (AOR = 1.08, p < 0.01).

Step 3: Establish that the mediator is significantly associated with the outcome variable, controlling for the main predictor

Multiple linear regression analysis (Table 36) showed that, controlling for engagement with alcohol marketing communications, there was a statistically significant relationship between overestimating the injunctive norm for drinking to get drunk on weekdays amongst college peers and negative attitudes towards non-drinkers (β = 0.078, p < 0.01).

Step 4: Calculate the $Z_{Mediation}$ score

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Using the parameter estimates and associated standard errors in Steps 2 and 3, $Z_{InjunctiveNorms}$ = 1.977 (p < 0.05), indicating support for a significant mediation effect of overestimating college peer's acceptance of drinking to get drunk on weekdays on the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

The null hypothesis that overestimated injunctive norms for drinking to get drunk on weekdays does not mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers is rejected.

III.6.3 Research Proposition 8: Conclusion

The data provides mixed support for the notion that overestimated college peer norms mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers.

Out of four mediating relationships tested, the data only suggests the existence of a mediating relationship in one instance – the analysis was consistent with a mediating role for the overestimation of perceived injunctive norms for drinking to get drunk on weekdays in the relationship between engagement with alcohol marketing and negative attitudes towards non-drinkers. Interestingly, this was also one of only two normative overestimations that mediated the marketing-consumption relationship in Research Proposition 7.

The conceptual underpinnings of how normative overestimations might mediate the relationship between marketing communications and negative attitudes towards non-drinkers are fairly self-evident. If engagement with marketing encourages individuals to believe that drinking, or drinking to get drunk, is more common than it is, then non-drinkers can be perceived as part of an outer-group who are somehow abnormal (Herman-Kinney and Kinney, 2013). In this fashion normative overestimations could provide an indirect pathway through which engagement with alcohol marketing communications could lead to negative attitudes towards non-drinkers.

A partial reverse mediation relationship is also somewhat plausible; in other words, marketing could foster negative attitudes towards non-drinkers which could then lead to overestimations of peer drinking and acceptability of same. However, a completely reversed relationship between the predictor and outcome variables, in which negative attitudes towards non-drinkers would predict normative overestimations which in turn would predict engagement with marketing, does not seem conceptually plausible.

The results of these four mediation tests are very similar to those examined for Research Proposition 7 which examined whether normative overestimations mediate the relationship between engagement with alcohol marketing and personal consumption.

The difference boils down to one particular relationship – overestimating the frequency of college peer drinking predicted greater frequency of personal drinking; it did not predict more negative attitudes towards non-drinkers. Further research is needed to explore the impact of overestimated norms on both behaviour and attitudes.

Appendix IV: Research Propositions 4,5,6,7 & 8: Discussion and Conclusions

IV.1   Secondary findings

When considering these so-called "secondary" findings garnered from Research Propositions 4, 5, 6, 7 and 8 it is important to remember that they are only secondary relative to the core findings in Research Proposition 1, 2 and 3. They are merely labelled as "secondary" for narrative purposes, in order to allow the reader to focus on the central issue of marketing, consumption and the mediating role of norms. These secondary findings extend and build upon the core findings in a number of ways and each of them still makes important contributions to the academic and policy debates about marketing, social norms and alcohol policy.

IV.1.1 Overview of secondary findings

The "secondary" findings examine the relationship between alcohol marketing communications and negative attitudes towards non-drinkers, as well as the indirect influence of marketing on attitudes towards non-drinkers via normative perceptions. They also examine the existence of social norm misperceptions and overestimations, as well as the mediating role of normative overestimations on the relationship between alcohol marketing communications and both consumption and negative attitudes towards non-drinkers.

IV.1.2 Marketing and negative attitudes towards non-drinkers (Research Proposition 4)

Research Proposition 4 examines the relationship between alcohol marketing communications and negative attitudes towards non-drinkers, and found a significant association between both engagement with marketing, and engagement with marketing

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online, and negative attitudes towards non-drinkers. However, there was no statistically significant association between exposure to marketing within the past week and negative attitudes towards non-drinkers.

IV.1.3 Perceived social norms as an indirect path for the influence of marketing on negative attitudes towards non-drinkers (Research Proposition 5)

Research Proposition 5 examines social norm perceptions as a mediating pathway for the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers. The data analysis suggested that perceived norms for close friend *frequency of drinking to get drunk* and perceived *acceptability of drinking to get drunk* amongst college peers could both act an indirect pathway through which engagement with marketing could foster negative attitudes towards non-drinkers. The data did not support the hypothesis that perceived descriptive norms for frequency of drinking mediated the relationship between engagement with alcohol marketing and negative attitudes towards non-drinkers.

IV.1.4 Social norm misperceptions (Research Proposition 6)

Research Proposition 6 examines both social norm misperceptions and overestimations. The data revealed a consistent pattern of self-other discrepancies, whereby respondents perceived that others *drank*, and *drank to get drunk*, with greater frequency than they themselves did. The extent of the self-other discrepancies also increased as social distance between the respondent and the reference group increased. Furthermore, the data showed that respondents overestimated the frequency with which their *college peers drank*, and

drank to get drunk, and that they also overestimated the acceptability of drinking to get drunk amongst their college peers.

IV.1.5 Misperceived norms as an indirect path for the influence of marketing on consumption (Research Proposition 7)

Research Proposition 7 investigated possible mediating effects of misperceiving the norm on the relationship between engagement with alcohol marketing communications and personal alcohol consumption. The data analysis suggested that overestimating the descriptive norm for *frequency of drinking*, and the injunctive norm for *frequency of drinking to get drunk*, could both provide an indirect pathway for the influence of alcohol marketing communications on personal alcohol consumption.

IV.1.6 Misperceived norms as an indirect path for the influence of marketing on negative attitudes towards non-drinkers (Research Proposition 8)

Research Proposition 8 examined overestimated norms as a mediator of the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers. The data supported the hypothesis that overestimating the injunctive norms for *frequency of drinking to get drunk on weekdays* could mediate the relationship between engagement with alcohol marketing communications and negative attitudes towards non-drinkers. The data did not support a mediating pathway for overestimating either the descriptive norm for close friend *drinking* or *drinking to get drunk*, or overestimating the injunctive norm for *drinking to get drunk on weekends*, in the relationship between engagement with marketing and negative attitudes towards non-drinkers.

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IV.2   Secondary contributions

Notwithstanding their designation as "secondary" findings, the above results still make a significant and unique contribution to theory in the field.

IV.2.1 Marketing and negative attitudes towards non-drinkers

The *negative attitudes towards non-drinkers* construct is relatively new (Regan and Morrison, 2011, 2013) and much work remains to be done in this field. It is believed that this is the first study which has shown an association between alcohol marketing communications and negative attitudes towards non-drinkers. This finding also makes a contribution to the wider alcohol expectancies literature – the negative attitudes towards non-drinkers construct is largely based on concepts derived from expectancy theory (Regan and Morrison, 2011).

Furthermore, from a practical perspective it suggests that not only could alcohol marketing normalise alcohol consumption, it may also contribute towards the stigmatisation of non-drinking, once again extending the debate from *whether* marketing influences alcohol related behaviour to *how* that influence might come about. This finding also suggests practical implications around the regulation of sociability appeals in alcohol marketing.

IV.2.2 Norms as antecedents of attitudes

The discovery that some types of normative perceptions may offer an indirect pathway for the influence of marketing on attitudes extends the literature on social norms in new, and under researched, directions by suggesting that normative perceptions may be an

antecedent of attitudes and of alcohol expectancies. The extensive literature on the theory of reasoned action (Fishbein and Ajzen, 1975) and the theory of planned behaviour (Ajzen, 1991) suggest a relationship between attitudes and norms. However, relatively few (see Olthuis et al., 2011 for an exception) studies have examined that relationship in the context of alcohol consumption.

This finding also extends the debate on alcohol marketing by once again pushing the field from the consideration of *whether* marketing influences behaviours and attitudes by suggesting pathways that could explain *how* this might occur.

IV.2.3 Marketing as a predictor of overestimated norms

Similar contributions arise from Research Propositions 7 and 8 which examined the mediating role of normative overestimations. While not every type of normative overestimation was found to offer a mediating path for the influence of marketing on behaviour or attitudes, the data does suggest the existence of indirect pathways for *some* types of normative overestimations.

From a theoretical perspective this marks a relatively new departure in at least two different ways. In terms of the social norms literature, most prior studies have tended to examine the influence of normative perceptions on alcohol consumption, but not specifically whether overestimated norms was associated with behaviour (for an exception see Haug et al., 2011). Secondly, this also seems to be the first study that has illustrated that marketing can lead to overestimated descriptive *and* injunctive norms.

IV.3.3 Normative misperceptions in Ireland

The confirmation of the existence of normative self-other discrepancies, and of overestimated norms, in the Irish context represents an important contribution to the social norms literature. It adds another country to the growing list of those where misperceptions have been found, and confirms the existence of misperceptions in heavy drinking cultures.

Appendix V: Publications and presentations associated with this research

<u>Book Chapters</u>

- Kenny, P. and Hastings, G. (2011) 'Understanding Social Norms: Upstream and Downstream Applications for Social Marketers', in G. Hastings, K., Angus and C. Bryant (eds) *The SAGE Handbook of Social Marketing,* London: Sage.

- Kenny P. and Hastings, G. (2010) 'Alcohol Advertising in Ireland: The Challenge of Responsibility and Regulation' in J. Hogan, P.F. Donnelly and B.K. O'Rourke (eds) *Irish Business and Society: Governing, Participating and Transforming in the 21st Century*, Dublin: Gill & McMillan

<u>Presentations</u>

- *"Understanding Social Norms: Applications for Social Marketers"*, National Social Marketing Conference, National University of Ireland, Galway, November 2012
- *"Alcohol Sponsorship: Corporate Philanthropy or Self-Interest"*, Time Please…For Change. Alcohol Action Ireland Conference, November 2012.
- *"Understanding Social Norms: Applications for Social Marketers"*, World Social Marketing Conference, Dublin, April 2011.
- *"Alcohol Marketing: Reviewing the Evidence"*, Bray Drugs Forum, November 2010
- *"Alcohol Marketing: Reviewing the Evidence and Pushing the Boundaries of Interactivity"*, Have we Bottled It? Alcohol Action Ireland Conference, September 2010.
- *"Alcohol Advertising in Ireland: Regulatory and Policy Challenges"*, National Social Marketing Conference, National University of Ireland, Galway, June 2010.
- *"Alcohol Marketing and Consumption: A Review of the Scientific Evidence"*, Alcohol Action Ireland Annual General Meeting, September 2009.

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