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Sarah Samdani
Technological University Dublin

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Social Norms Marketing, Social Networks and Alcohol Consumption: A Collegiate Context

Investigating Feasibility in Ireland

Submitted in partial fulfilment of the requirements of Dublin Institute of Technology for the
award of Doctor of Philosophy

By

Engr. Sarah Samdani (MSc.)

School of Marketing, Faculty of Business, Dublin Institute of Technology

11th May, 2013

Supervisors:

Dr. Eddie Rohan ¹

Mr. Patrick Kenny ¹

Dr. Elisa Bellotti ²

¹School of Marketing, Faculty of Business

Dublin Institute of Technology, Ireland

² Sustainable Consumption Institute and Mitchell Centre for Social Network Analysis

University of Manchester, United Kingdom

Declaration

I certify that this thesis, which I now submit for examination for the award of PhD degree, is entirely my own work and has not been taken from the work of others, save and to the extent that, such work has been cited and acknowledged within the text of my work.

This thesis was prepared according to the regulations for postgraduate study by research of the Dublin Institute of Technology and has not been submitted in whole or in part for another award in any Institute.

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Abstract

The current Irish policies have not been adequately effective in reducing alcohol consumption. There is a need to consider alternative strategies, such as the increasingly popular SN marketing campaigns, which have been applied successfully in the US college system. However, the potential of these campaigns has not been evaluated in Ireland. It is also not clear from the literature if descriptive or injunctive norm types will be more likely to induce behaviour change. Further, while SN interventions tend to provide ‘friends’ or ‘typical student’ as referent groups, little is understood about how individuals visualize these groups and how salient these peers are. The present study addressed these issues by combining web based survey methods with social network analysis. Hierarchical multiple regression was used to analyse a web survey of 1700 DIT students. Further, 26 ego networks generated via in depth interviews were examined using network techniques combined with a qualitative analysis to understand norm salience. The study provides evidence of overestimations of the campus drinking norm at DIT. It shows that perceived norms impact personal consumption and that social distance is a key consideration in this regards. Further, the findings demonstrate that descriptive norms are stronger predictors of personal consumption than injunctive norms. Most importantly, the study provides evidence that individuals’ social networks are key determinants of their drinking behaviours and that the most salient peers for DIT students are embedded in cohesive sub groups outside college. The study does not support using SN campaigns to reduce alcohol consumption in DIT. It urges policy makers to address norm salience in intervention work as it is critical for the applicability, planning and success of SN campaigns.

Keywords: Social norms theory, college drinking, social network analysis, ego networks.

DEDICATION

This is to

My parents

Dr. G.M Samdani and Tahira Samdani

(I am because you are)

And my husband

Dr. Salman Ali Mumtaz

(For none of this would have been possible without you)

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Abbreviations

AAI	Alcohol Action Ireland
ABFI	Alcohol Beverage Foundation of Ireland
AMCMB	Alcohol Marketing Communications Monitoring Body
ASAI	Advertising Standards Authority for Ireland
BAC	Blood Alcohol Content
BAI	Broadcasting Authority of Ireland
BCC	Broadcasting Complaints Commission
BCI	Broadcasting Commission of Ireland
CCCI	Central Copy Clearance Ireland
DIGI	Drinks Industry Group of Ireland
DIT	Dublin Institute of Technology
DoHC	Department of Health and Children
ESPAD	European School Survey Project on Alcohol and Other Drugs
GAAG	Government Alcohol Advisory Group
HSB	Health Service Board
HSE	Health Service Executive

ITA	Intoxicating Liquor Act
MEAS	Mature Enjoyment of Alcohol in Society
NDTRS	National Drug Treatment Reporting System
NDTRS	National Drugs Treatment Reporting System
OECD	Organization for Economic Cooperation Development
OTC	Office of Tobacco Control
PRSI	Pay Related Social Insurance
PULSE	Police Using Leading Systems Effectively
RAND Corporation	Research and Development Corporation
RRAI	Responsible Retailing of Alcohol in Ireland
RSA Training	Responsible Serving of Alcohol Training
RSA	Road Safety Authority
SN	Social Norms
SNA	Social Network Analysis
STFA	Strategic Task Force on Alcohol
UCD	University College Dublin
WHO	World Health Organization

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1 Introduction

This chapter presents a preface to the thesis. It moves from describing the theoretical framework to outlining the scope and limitations of this study before culminating in a roadmap of the thesis.

1.1 The Social Norms (SN) Theory and SN Marketing Interventions

The SN theory focuses on peer influence and the role it plays in individual decision making around behaviours such as drinking. It argues that our behaviour is influenced by misperceptions of how other members of our social groups think and act. With regards to drinking, students often perceive their peers' to have more permissive attitudes and behaviours towards alcohol than they themselves. In efforts to match these exaggerated perceptions, their own consumption levels increase. Accordingly, the theory also states that correcting misperceptions of perceived norms can result in a decrease in problem behaviour or an increase in the desired behaviour.

The specific application of SN theory to college drinking as a prevention strategy was first recommended by Perkins and Berkowitz (1986). Since then, the use of SN based marketing campaigns has gained immense popularity and prominence in the US where it has been found to be successful in reducing drinking rates in college students. These interventions seek to correct misperceptions of peer drinking norms by providing normative feedback about the actual drinking rate of an average or typical student on campus (Perkins and Craig, 2003a). This feedback is often provided by utilizing social marketing techniques and hence the name 'SN marketing' came forth. The potential of these campaigns in Ireland is yet to be evaluated.

1.2 Scope and Limitations of the Study

1.2.1 Scope

Coverage of Issues: The study draws on three bodies of literature namely, the SN theory, SN marketing interventions and social network analysis (SNA). It tests the SN theory in Ireland to assess the potential of SN marketing campaigns as a strategy to reduce drinking rates in Irish colleges. It also focuses on deepening our understanding of two key theoretical issues in the SN literature. The first issue is related to examining the relative impact of descriptive and injunctive norm types on individuals' drinking behaviours. The second issue concerns the need to understand how norm salience influences drinking behaviour and how it may impact the effectiveness of a SN based intervention. The study utilized SNA as a methodology to examine and understand norm salience. In doing so it examined the compositional and structural aspects of social networks surrounding the participants and the subjective meanings associated with these relationships.

Research settings and population: The study took Dublin Institute of Technology (DIT) as its research setting. The population for this study comprises full time Irish undergraduate students enrolled at DIT during the academic year 2010-11.

Methodological Approach: The study was based around five research objectives which emerged from the review of literature presented in chapters 3 and 4. These are stated formally in chapter 5. The data was collected and analysed in two waves.

Establishing misperceptions of peer drinking norms and determining their impact on the drinking behaviour of population of interest is a key assumption of the SN theory and a

necessary prerequisite of any SN marketing intervention. In the first wave of data collection, a campus wide web survey was conducted which primarily assessed the drinking behaviours of respondents and their perceptions of the behaviour among most students in DIT. In addition, the survey also assessed the perceived norms for close friends, best friend, mother and father. Further, the perceptions of two types of norms namely descriptive and injunctive were examined in the survey. The resulting data comprising responses from a sample of 1700 students was imported into SPSS and hierarchical multiple regression was used for analysis.

Central to the effectiveness of any SN marketing campaign is targeting the most salient norms. It is a complex issue because it requires knowledge of the individuals' environments, their social networks and the importance they attach to these networks. SNA provides a way to address this issue. It is a growing field which encompasses theories, models, and applications to study the relationships between a set of actors (Marsden, 2005). The second wave comprised unstructured in depth interviews with 26 individuals who were selected from the survey sample based on a pre defined criteria. These interviews focused on extracting the networks comprising people with whom the participants '*discussed important matters*' and with whom they '*liked to socialize or party*'. In addition, these interviews were based around exploring the relationships participants shared with their network members, the subjective meanings they attached with these associations and the development and reinforcement of drinking behaviours and attitudes in the networks. The in depth interviews generated two types of data. The network data, which was imported in UCINET software (Borgatti et al., 2002) for the application of network techniques and the verbatim text of the interviews generated from the audio recordings which was subjected to a qualitative analysis. The study linked the outcomes of the two data collection methods which are discussed in chapter 8.

1.2.2 Limitations

The study did not cover undergraduate student populations in other third level institutes in Ireland. The quantitative findings therefore may only be generalized to DIT students. The network results are based on a non representative sample but may be naturalistically and tentatively generalized to the extent of being a phenomenon of commuter colleges as will be explained more fully in chapter 5 and chapter 9.

This study was cross sectional in design which is why causal inferences cannot be made with certainty. The findings presented herein are based on the assumption that normative perceptions cause personal consumption. This assumption was made on the basis of theoretical knowledge and past longitudinal research (Fearnow-Kenny et al., 2001).

As is mostly the case with alcohol related survey research, the findings of this study are based on self reports of personal alcohol use.

Networks examined in this study were based on how individuals viewed their networks rather than collecting network data from each network member. This is an inherent feature of ego network analysis. Finally, the network typologies identified in this study are not exhaustive of all possible typologies.

1.3 Thesis Plan

A chapter by chapter outline of this thesis is presented next.

Chapter 2 provides context to this study. It looks at the current consumption trends in Ireland, draws attention to the excess of heavy drinking in Ireland and the harms caused by it. The

discussion highlights that the current policy has not been hugely effective in producing positive results and that there is a need to consider alternative strategies.

Chapter 3 reviews the research related to SN approach. It moves from describing the theoretical aspects of the SN approach to examining it as an intervention strategy and describing its postulates, assumptions, criticisms and limitations. It identifies the theoretical gap in literature which warrants further investigation.

Chapter 4 introduces SNA as a perspective, summarizes its history and guiding principles and examines how it can be suitable in addressing norm salience. It also reviews network research conducted in the domain of substance use, particularly alcohol consumption. It concludes with a discussion on the limitations of SNA and criticisms raised against it.

Chapter 5 describes the methodology of this research in detail. It formally presents the research objectives and hypothesis of this study, their origin, rationale and the research philosophy. It then describes various aspects of research design including the choice of data collection instruments and specific issues related to them, the development, pre testing, administration and reliability/validity of these instruments, the sampling strategy for both waves of data collection, the recruitment of subjects, the ethical concerns in this study and the steps taken to address them. It concludes with a discussion on the limitations of the underlying methodological approach.

Chapter 6 provides the descriptive statistics and present the results of hierarchical multiple regression. In parallel, it also compares the results with past research. The chapter concludes with a summary of the main findings

Chapter 7 presents a compositional and structural analysis of the networks combined with a qualitative interpretation of the interviews. An assessment of tie strength and the subjective meanings associated with these relationships is presented in parallel. The chapter concludes with a summary of the main findings.

Chapter 8 integrates the survey and interview data. It explores the relationship of individuals' drinking behaviours and perceived norms of their proximal peers as reported in the web survey with the perceived norms of their network members. In doing so, the chapter investigates how drink related norms were formed, reinforced and transmitted through the networks. A cross case analysis provides an overall summary of the findings. The results are based on a qualitative interpretation of the interviews and guided by the sense of the participants' descriptions of their networks. The chapter also links the outcomes of the two data collection methods.

Finally, chapter 9 revisits the research objectives and addresses them one by one in light of the evidence. It also discusses the theoretical contributions of this study and their practical implications. It then describes the limitations of this study and concludes with some useful recommendations for future research.

2 Research Context

2.1 Introduction

This chapter provides context to the study by showing that excessive drinking is a serious concern in Ireland having led to several social and health consequences. It draws attention to the inadequacy of Irish policies in dealing with this issue and highlights the need to consider alternative strategies such as the SN approach, which has been successful in other countries. Additional details about alcohol consumption trends in Ireland, related social and health harm and an outline of alcohol policy activity in Ireland from 1990-2012 is presented in appendix 1. Chapter 3 extends the discussion of SN approach and reviews related literature

2.2 Alcohol Consumption in Ireland

Ireland is one of the heaviest consumers of alcohol in the enlarged EU and worldwide with the Irish people drinking about 20% more than the average European (AAI, 2011). The trend for alcohol consumption (per adult) for the years 1987- 2011 is presented in Figure 1. The consumption of alcohol in Ireland increased by 46% between 1987 and 2001 when it hit a record high of 14.3 litres of pure alcohol per adult. There was a decline of 6% in 2003 for the first time in sixteen years attributed mainly to a large drop in spirit sales following an increase in excise duty (DoHC, 2004). Another decline in consumption was observed in 2008-09, followed by an increase in 2010. This was partially influenced by changing trends in cross border shopping (Hope, 2007). Since, 19% of the adult population abstain from alcohol

completely, those who do drink consume much more than the average statistics indicate, making the effective drinking rates even higher (DoH, 2012).

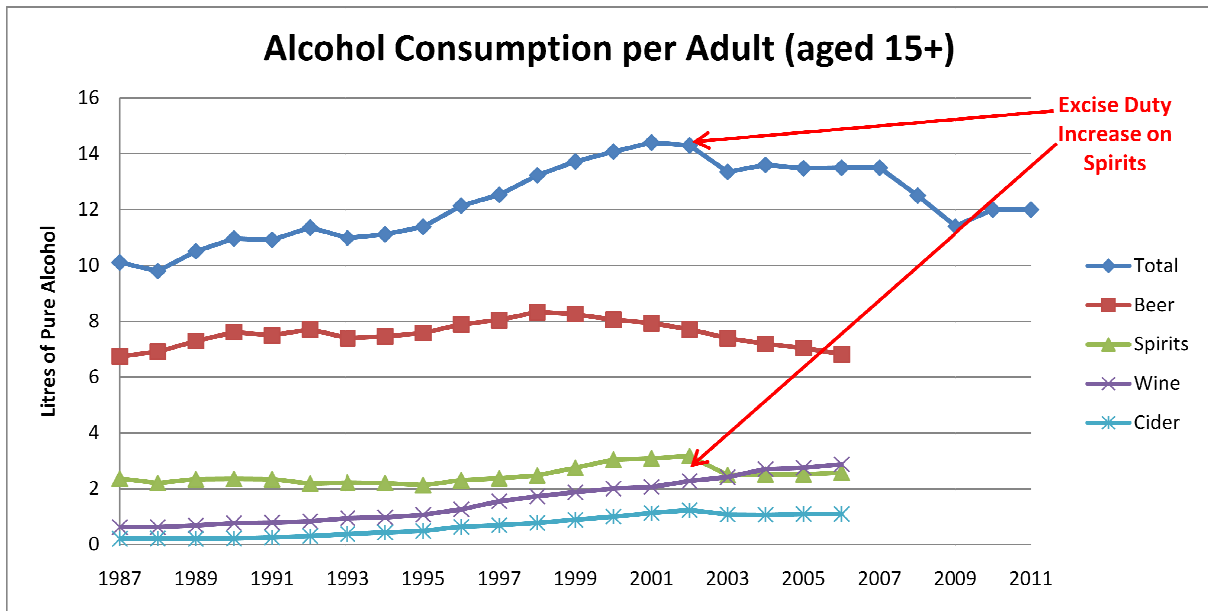


Figure 1: Alcohol consumption per Adult in Litres of Pure Alcohol. (Hope, 2007; Foley, 2012)

About a quarter of the Irish population report binge drinking every week (AAI, 2011). Underage drinking is a serious problem constituting an illegal market of at least €145m (OTC, 2006). Irish teenagers aged 15-16 years have been shown to binge drink and abuse alcohol more than their European counterparts (Hibell et al., 2012).

2.3 Alcohol Related Health and Social Consequences in Ireland

Every seven hours, someone in Ireland dies from an alcohol-related illness (AAI, 2011). Between 1992-2002, more than 14000 people died in Ireland from alcohol related conditions and suicide (DoHC, 2004). An increase of 92% was recorded in alcohol related hospital

discharges between 1995-2002 (Mongan, 2007). A total of 42,333 cases were presented with alcohol as the main problem substance during 2005-2010 accounting for over half of all cases treated for problem substance use during this period (Carew et al., 2011). Alcohol contributed to 36.5% of all fatal road accidents in Ireland in 2003 (Mongan et al., 2009).

At least 271,000 children in Ireland are being exposed to risk as a result of parental hazardous drinking (Hope, 2011). Divorce rates are twice as high in marriages suffering from issues of alcohol use compared to those without such problems (Mongan et al., 2009). A study examining domestic violence reported that 11% of the population experienced severe abuse and in one quarter of these cases, alcohol was always involved (Watson and Parsons, 2005).

In a study of over 3000 Irish adults, alcohol was found to be involved in almost half of the cases (53% of men and 45% of women) of sexual abuse that occurred in adulthood (McGee et al., 2002). Assaults increased by 20% and disorderly conduct by 23% between 2004-2010 and half of these were alcohol related (AAI, 2011). Analysis of Garda PULSE¹ data for the years 2003-07 found that the total number of drunkenness, public order and assault offences² increased by 30% from 50,948 to 66,406. The 18-24 year old age group accounted for two fifth offences (Mongan et al., 2009).

Problem alcohol use cost an estimated €3.7 billion to the Irish society in 2007 (Byrne, 2010). According to the Chief Medical Officer of Ireland, these figures suggest that a 30% reduction in alcohol-related harm would save taxpayers an estimated €1 billion a year.

¹ The Gardai PULSE (Police Using Leading Systems Effectively) system launched in 1999 records data on crime, traffic management, progression of criminal cases through the courts, fire arms licensing and drivers licenses

² Although public order and assault offences are not necessarily alcohol-related, there is sufficient international evidence suggesting a strong relationship between alcohol consumption and such offences. (Mongan et al, 2009)

2.4 Irish Policy Interventions

Tax and pricing: International evidence suggests that an increase in alcohol prices decreases consumption and alcohol related harm (Anderson et al., 2009) and that increasing taxes on alcohol and minimum pricing³ are effective policy options (Mongan et al., 2009; Purshouse et al., 2009). Ireland lacks a legislative basis for introducing minimum pricing. Since 2000, there have been three⁴ increases in excise duty rates in Ireland followed by a subsequent decrease in consumption. In 2009, excise duty was reduced followed by a 5.3% increase in consumption in 2010. The Irish drinks industry does not support increasing excise rates on alcohol and introducing minimum pricing. It points instead to its role in the economic prosperity of Ireland and cautions that the above measures would threaten Irish jobs, tax revenues and income from exports. In the mean while, the affordability of alcohol in Ireland has increased by 50% between 1996-2004 (Rabinovich et al., 2009) indicating that strict policies are required.

Availability: The availability of alcohol has substantially increased through longer opening hours and an increase in the density of off licensed outlets. The Intoxicating Liquor Act (2008) strengthened some laws, the most significant of which was restricting the opening hours for off licenses. However, no evaluation of the impact of these regulations has taken place.

Marketing and Advertising: Alcohol marketing in Ireland is regulated by several voluntary codes embedded in a self regulation system largely maintained by the drinks industry which has not been sufficiently adequate in reducing alcohol related harm in Ireland or making

³ The cost of alcohol is based on the number of units it contains. The lowest price is then set at which an alcohol product can be sold. The more alcohol content a product has, the more expensive it is (Mongan et al, 2009)

⁴ Cider in 2001, spirits in 2002 and wine in 2008

alcohol any less available to the population. It would appear that the drinks industry seeks to counterbalance reports of alcohol misuse by emphasising responsible marketing of its products. In the mean while, Irish youth continue to be exposed to alcohol marketing practices through a variety of channels and strategies including price promotions, appealing adverts and packaging (Hope and McCrea, 2009). Public health advocates often regard it to be an exercise in public relations aimed at allaying public concern rather than taking actual measures.

Drink Driving: Random breath testing introduced in 2006 and a new lower BAC limit of 50mg and 20mg for professional and novice drivers respectively have been effective measures.

Education: The Department of Education and Skills delivers the SPHE (Social, Personal and Health Education) programme in junior high schools which focuses on substance abuse as part of a wider curriculum (DoH, 2012). However, the continuation of this programme in senior cycle remains a challenge. Similarly, prevention efforts such as the SN marketing campaigns have been largely ignored in Irish policy making despite their success in other countries. In the mean while, Irish children continue to drink with 1 in 5 being a weekly drinker (GAAG, 2008).

2.5 Conclusion

Alcohol related harm in Ireland far outpaces the economic benefits generated by the drinks industry and necessitates the consideration of alternative strategies to protect and preserve public health. One approach in this regards has been the implementation of SN marketing campaigns in the US and some other countries. Based on the SN theory, these campaigns have apparently been successful in reducing alcohol consumption rates on college campuses. Chapter 3 reviews the theoretical basis of this approach and discusses related literature.

3 Literature Review: The Social Norms Approach

3.1 Introduction

Norms have evolved as a popular sociological concept that reflects behavioural rules. They are cultural phenomenon which have the power to ‘prescribe and proscribe’ behaviour in specific situations (Hechter and Opp, 2001) and are presumed by many in the field to represent a powerful source of influence on human behaviour (Cialdini et al., 1990; Larimer and Neighbors, 2003; Berkowitz, 2004). From a theoretical point of view, classic research in social psychology has long argued that friendship affiliation needs and social comparison processes (Festinger, 1954), pressures towards peer group conformity (Asch, 1951) and the formation and acquisition of reference group norms (Newcomb, 1943; Newcomb et al., 1966; Sherif, 1972) typically coalesce to encourage (or force upon) individuals to act in accordance with their peers' expectations and behaviours (Perkins and Wechsler, 1996). The research on social norms is scattered across several disciplines and substantive topics such as queuing (MacCormick, 1998), binge eating (Giles et al., 2007), substance use (Maxwell, 2002), crime (Sampson et al., 1997) and social order (Hechter and Kanazawa, 1993). As discussed in the forthcoming pages, the literature on substance use particularly that focussing on college drinking, frequently links alcohol consumption to the normative influence of peers in the peer intensive environment that characterizes college life (Wood et al., 1992; Turrisi, 1999; Clapp and McDonnell, 2000; Wood et al., 2001). This forms the basis of a widely implemented social norms strategy to reduce alcohol consumption on college campuses more commonly known as the ‘Social Norms Marketing Approach’.

This chapter begins by specifying the meaning and significance of norms, describing the types of social norms used specifically in the college drinking literature and examining the literature on social influence, a widely recognized factor believed to facilitate the dissemination of drinking norms among young adults. It then introduces the SN theory and describes its postulates and assumptions. The discussion then focuses on SN marketing interventions which are based on the SN theory and reviews the success and limitations of this prevention strategy in light of empirical findings. The chapter concludes with a review of commonly raised criticisms against the approach and the identification of some substantive theoretical issues in the literature that call for further examination.

3.2 What are Norms?

The attention that norms and normative beliefs have received over the years especially in the context of college drinking, has led researchers to explicate further the idea of norms with several definitions emerging in the literature depending on the focus of the researcher. Put simply, norms are rules that serve as a guide about how people are supposed to behave or believe (Francessa, 2009). In order to interpret and understand the research on social norms, it is crucial to address how norms have been conceptualized in this work. College drinking literature reflects the use of two closely related terms. These are the descriptive and the injunctive norms - articulated by Cialdini and colleagues (1990).

3.2.1 Descriptive Norms

One source of reassurance that people look for when trying to determine appropriate social behaviour, is the descriptive norm relevant to the situation (Cialdini and Trost, 1998).

Descriptive norms also known as ‘popular norms’, ‘norms of prevalence’ or ‘norms of ‘is’ refer to individuals’ beliefs about the prevalence of a behaviour (Rimal and Real, 2005). Put differently, these are derived from the perceived actions of other people in a given situation. Consequently, such perceptions serve as a guide for behaviour particularly when the situation is ambiguous (Festinger, 1954; Lapinski and Rimal, 2005). In addition to this, descriptive norms provide us with consensus information – when the majority responds to the same situation in the same way, we perceive the behaviour to be normative (Cialdini and Trost, 1998) and follow suit. This heuristic of ‘social proof’ saves us the cognitive effort of choosing an appropriate course of action (Cialdini, 1993). In the specific context of alcohol consumption, descriptive norms refer to the perceptions of others’ quantity and frequency of drinking (Borsari and Carey, 2001). Largely based on observations and experiences, these provide information about how people consume alcohol in various drinking situations.

3.2.2 Injunctive Norms

Injunctive norms go beyond simply describing appropriate behaviour to prescribing it as well as proscribing inappropriate actions (Cialdini and Trost, 1998). Expanding on the above, this norm construct is commonly used to refer to behaviours which are accompanied by social acceptance or approval of others. Put formally then, injunctive norms characterize the perceptions of what most people approve or disapprove (Cialdini et al., 1991). Also known as ‘prescriptive norms’, ‘norms of approval or acceptability’ or norms of ‘ought’, these represent the perceived moral rules of the group and help people determine, what is acceptable and unacceptable social behaviour (Borsari and Carey, 2003; Rimal and Real, 2005; Lewis and

Neighbors, 2006a). In the context of alcohol consumption, these refer to the perceptions of social acceptability and unacceptability of drinking and drunkenness among peers.

3.2.3 Distinction between Injunctive Norms and Subjective Norms

The term subjective norm was first used in the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980) and its successor, the theory of planned behaviour (TPB) (Ajzen, 1991). The theories conceptualized subjective norms as a combination of perceived expectations from relevant individuals or groups along with intentions to comply with these expectations.

Since then, research has reflected two contrasting opinions on use of the term ‘subjective norms’. Some researchers regard it as a variation of injunctive norms. For example, Ravis and Sheeran (2003) and Lapinski and Rimal (2005) describe that the subjective norms construct, as articulated in the TRA and TPB is a form of injunctive norms in that they are concerned with the motivation of people to comply with beliefs of important referents. In contrast, other researchers treat subjective norms as being distinct from injunctive norms and provide more precise definitions more so in conjunction with TRA and TPB. For example, Finlay and colleagues (1999) describe subjective norms as an individual’s perception about what important others think the individual should do (Finlay et al., 1999). Park and Smith (2007) support this and strengthen the distinction by suggesting that subjective norms are measured by the perceptions of important others’ expectations (i.e., they “think that I should...”), and injunctive norms are measured by the perceptions of important others’ approval (i.e., they “would approve of my...”). It is important to appreciate this distinction to avoid interchangeable use of the terms. Reflecting on the above, injunctive norms refer to the ‘beliefs of

acceptability' of behaviour whereas subjective norms refer to the 'beliefs of expectancy of behaviour in important referents'.

3.2.4 Characteristics of Norms

The aforementioned conceptualization or in fact any definition of social norms has four principal aspects.

First, norms are not simply rules. In fact norms are thought to be in place if any deviation from them incurs some kind of punishment (Summer, 1906; Rimal and Real, 2003). The idea of 'sanctions' is central to the concept of norms because in the absence of some sort of enforcement mechanism, rules become completely discretionary and have no binding force (Bendor and Swistak, 2001; Hechter and Opp, 2001). Scholars differ in their views about what makes norms effective and powerful. Two contrasting viewpoints appear in the literature. Some researchers argue that norms are internalized, implying that individuals apply sanctions to their own behaviour and respond to these internally generated rewards or punishments (Durkheim, 1951; Elster, 1989; Coleman, 1990). A majority of scholars however emphasize the role of external sanctions. According to this view, norms are generally enforced by sanctions which materialise either in the form of rewards for complying and conforming with them or punishments for deviant behaviour (Hechter and Opp, 2001). These sanctions come from the social networks of individuals rather than the legal system (Cialdini and Trost, 1998; Marin and Wellman, 2010).

Second, norms are different from laws (Cialdini and Trost, 1998; Rimal and Real, 2003). This is an important consideration because laws come in force through a deliberate procedure,

precisely specified in written texts, linked to particular sanctions and enforced by a specialized bureaucracy (Bendor and Swistak, 2001). Norms on the other hand are understood through social interaction. Hechter and Opp (2001) elaborate that social norms are often spontaneous, unwritten and enforced informally. Sociologists concur that norms propagate through social influence, the fundamental principle of which is consensus (Cialdini and Trost, 1998; Hechter and Opp, 2001). Although the amount of acceptance is unspecified, it is generally argued that at least some level of consensus is necessary among group members regarding the validity of the rule (Hechter and Opp, 2001).

Third, norms do not exist independently of individuals' group identity. The sense of belonging to the group triggers appropriate behavioural measures in line with group expectations as has been predicted by theories such as the social identity theory (Tajfel and Turner, 1986).

Finally, norms are shared belief systems which largely disseminate through observation and communication (Bendor and Swistak, 2001).

3.3 Theory of Social Ecology and Importance of Norms

Social ecological models find their roots in Bronfenbrenner's (1977) theory for ecology of human development. Bronfenbrenner (1977) defines the person-environment interrelationship in terms of micro, meso, exo and macrosystems. Microsystems refer to the principal and immediate socialization contexts (family, school and college contexts for adolescents). A mesosystem is formed from the interrelations among microsystems. For example, the connection between an adolescent's family and his friends represents a mesosystem. Exosystems comprise more distant social environments for example the neighbourhoods in

which the microsystems are embedded. Finally, macrosystems are composed of cultural values, customs and laws. The theory has been embraced by health specialists who recommend its use in college alcohol prevention (Perkins and Berkowitz, 1986; Hansen, 1997). Social ecology theory for alcohol and drug use prevention (Hansen, 1997) postulates that informal rules (norms) about alcohol consumption and drug use rather than formal ones (policies) influence individual behaviour. Hansen (1997) also describes 16⁵ social units relevant to college students which may have varying levels of influence on their alcohol and drug use. The social ecology theory suggests that the more profoundly a social unit affects interaction among students, the more likely it will be to influence behaviour and that in order to change a particular behaviour we must address the effects of social influence. Social influence perspective and related research is reviewed in the following section.

3.4 Social Influence Research

Norms often operate through the medium of social influence (Cialdini et al., 1990), which is a fundamental component of all models of adolescent substance use (Graham et al., 1991). Social influence occurs when people continually compare themselves with others to ascertain if their own behaviour is appropriate (Maxwell, 2002). In studying risk and protective factors, many researchers have examined the contribution of social influences in the initiation and perpetuation of drinking among adolescents (Wood et al., 2004). This literature has

⁵ These units in decreasing order of potential for social influence are (1) friends and acquaintances (2) dormitories and roommates (3) parties (4) cafes, nightspots, stores and hangouts (5) classes and classmates (6) fraternities and sororities (7) special interest clubs and groups (8) campus sponsored special events (9) worksites (10) athletic teams (11) the student newspaper (12) religious fellowships (13) the faculty (14) student government (15) the administration (16) student health services (Hansen, 1997)

predominantly focussed on studying peer influences especially among young adults such as college students (Baer et al., 1991; Baer and Carney, 1993; Borsari and Carey, 2001; Borsari and Carey, 2003).

Within the context of alcohol consumption, peer influences are those interpersonal factors which are present in the immediate or potential drinking environment (Borsari and Carey, 2001). The nature of social influence impinging on an adolescent however has been only broadly described in the early research (Graham et al., 1991) and often theorized under the concept of peer pressure. Borsari and Carey (2001) argue that peers can exercise social influence in relation to alcohol consumption in two distinct ways: directly and indirectly.

3.4.1 Direct Peer Influence

Direct (or active) peer influence refers to explicit offers to consume alcohol (Graham et al., 1991; Wood et al., 2004). Examples of such influences can range from polite gestures such as buying a round to verbal prompting and encouragement such as encouraging an individual to drink during drinking games. Borsari and Carey (2001) note that there is indeed relatively little research documenting if direct offers and active pressures influence personal alcohol consumption. From research that does exist on the topic, two themes of interest emerge.

First, drinking is an important ingredient of social functions at college and students who do not drink heavily in college drinking situations are naturally regarded as unusual and become the targets of active social pressure by being offered drinks frequently and exposed to teasing from peers (Rabow and Duncan-Schill, 1995).

Second, some students can resist peer offerings of alcohol and are thus not susceptible to active peer pressure. This is mostly associated with maturity, social ease (Shore et al., 1983) and year in college (Klein, 1992). Intrinsically, younger students who are new to college life may be more likely to be influenced by overt pressure to consume alcohol than older students. A gender effect also appears to exist suggesting that women are more resilient to active influence (Klein, 1992). Based on the findings of a study of 562 undergraduate students at a private American university, Klein (1992) reports that unlike men who demonstrated no significant changes over the course of their college years, women in this study appeared to mature throughout, gradually progressing towards an adult like developmental stage at least as far as their drinking patterns and alcohol related attitudes were concerned.

Preventive interventions designed to address active social influences focus mostly on reinforcing refusal skills (Wood et al., 2001). The limited studies on active influences make it difficult to determine the validity and reliability of the measures used in such research and should therefore be treated with caution (Borsari and Carey, 2001).

3.4.2 Indirect Peer Influence

In contrast, indirect (or passive) peer influences are triggered when peers set examples through their own actions thus providing an adolescent with information about what is in vogue and socially normative (Graham et al., 1991; Borsari and Carey, 2001). This provides guidelines to an adolescent about what behaviours are likely to lead to social acceptance and reinforcement. Wood et al (2004) summarize indirect peer influences as being related to an individual's perception and interpretation of alcohol consumption and reinforcement patterns of others.

These are further classified to include two dimensions that have been linked to drinking behaviour, modelling and perceived norms.

3.4.2.1 Modelling

Modelling refers to the temporary and concurrent imitation of another's behaviour. Interest in modelling began when an earlier study (Cutler and Storm, 1975) noted the alcohol consumption of college students to be positively associated with their drinking group size. Much of the research carried out in relation to social modelling is experimental in nature. A typical example of this involves placing participants in a situation where they are free to consume alcohol along with other volunteers, who unknown to participants are actually confederates of the researcher. A modelling effect is observed if a participant's alcohol consumption matches that of the confederate. Research indicates that this effect is influenced by the characteristics of both the participant and the confederate (Quigley and Collins, 1999). Borsari and Carey (2001) note three aspects of modelling research. First, participants only model concurrent behaviour of the confederate meaning that the effect does not continue to influence individual consumption once outside the control environment (Cooper et al., 1979). Second, the modelling process is influenced by the composition of the group, if any. For example, in a study where two confederates drink at different rates, the participants are likely to match the fastest (DeRicco and Niemann, 1980), whereas in a larger group, majority behaviour is modelled (DeRicco, 1978). Third, friendliness of the confederate during the session also appears to have an effect as participant drinking has been noted to converge more rapidly with a model who appears to be more sociable (Maisto et al., 1999). Research also notes that heavy social drinkers drink significantly more in the presence of heavy drinking

models than do light social drinkers (Lied and Marlatt, 1979). This suggests that regardless of the modelling conditions, heavy drinkers will drink more than light drinkers. Those with a family history of drinking problems are believed to match the confederate's consumption to a greater extent than others (Chipperfield and Vogel-Sprott, 1988) and females are believed to consistently consume less alcohol than males (Cooper et al., 1979; Lied and Marlatt, 1979; DeRicco and Niemann, 1980).

There is evidence that the modelling effect occurs even after the participants are made fully aware of the confederate and aims of the study (Dericco and Garlington, 1977). This suggests that campaigns attempting to raise awareness of modelling and imitation effects may not help in reducing personal consumption (McAlaney, 2007). Wood et al (2001) suggests that from a social modelling perspective, preventive interventions to reduce alcohol abuse need to focus on decreasing the occurrence of heavy drinking in the proximal environment. However, it is crucial to note that the external validity of the modelling research is limited by highly controlled experimental interactions, fewer studies with female participants and inability to compare drinking durations with those commonly encountered in college settings (Borsari and Carey, 2001).

3.4.2.2 Normative Beliefs

Another source of social influence identified by literature is the normative beliefs or perceived norms and like modelling, these influence one's alcohol consumption indirectly (Graham et al., 1991; Borsari and Carey, 2001; Wood et al., 2001; Wood et al., 2004). The literature on normative beliefs emphasizes that these often stem from adolescents' perceptions of peer behaviour rather than the actual behaviour (Wood et al., 2001). This is in conjunction with a

sociological precept and what has come to be known as the ‘Thomas Theorem’ stating that if people define situations as real, they are real in their consequences (Thomas and Thomas, 1928). The very idea continues to be accepted and acknowledged by the researchers as a powerful way of comprehending human behaviour (Perkins, 2002). For example, Perkins (1997) remarks that indeed the strongest form of peer influence may occur indirectly through an individual’s perception of peers regardless of the accuracy of that perception. This is an important element of the SN theory the effects of which will be discussed in section 3.6.

The literature suggests that normative beliefs are constructed from three primary sources which are observable behaviours, direct and indirect communications and knowledge of the self (Miller and Prentice, 1996). These are the key concepts behind several behavioural theories and models. The social cognitive theory (Bandura, 1986) for example describes the processes by which social influence factors contribute to behaviour. Among other things, it emphasizes the influence of normative perceptions on behaviour over and above the immediate effects of active social pressure and modelling. Perkins (1997) argues that several factors combine to move individuals to perceive the world as their group does, to adopt peer attitudes and to act in accordance with peers’ expectations and behaviours. Such factors have long been discussed by classic research in social psychology and form the basis of SN theory. The social comparison theory (Festinger, 1954) for instance explains individuals’ need to evaluate their own attitudes by comparing themselves to similar others. Social Impact theory (Latane, 1981) describes social influence as a function of strength (how important the referent group is to you), immediacy (how close the group is to you) and group size. The theory postulates that as strength and immediacy increase within a group, conformity with its norms also increases. Further, as the size of a group increases, a single person has less of an effect. Social

categorization theory (Turner et al., 1987) assumes that the social norms of an in-group are perceived by its group members to be objectively true and appropriate.

Even if behaviour such as heavy drinking and drunkenness is viewed as deviant by the larger society, young people may still socially learn and continue to engage in abusive drinking in response to peer group norms (Perkins and Wechsler, 1996). As the literature identifies, there is consistent evidence establishing that normative perceptions of alcohol consumption in others are predictive of both personal drinking (Wood et al., 1992; Nagoshi, 1999; Clapp and McDonnell, 2000; Mallett et al., 2009) and drinking problems (Wood et al., 2001). Normative beliefs are discussed in the literature as being the most researched of all the forms of social influence particularly in the context of alcohol consumption and arguably the ones most open to modification. As will be discussed in section 3.7, these are also being used worldwide in an increasingly popular and apparently effective intervention strategy to reduce alcohol consumption among college students.

3.5 Students and Susceptibility of Social Norms

College is a time of social anxiety for students characterized by the desire to gain acceptability among peers and the pressure to fit in with perceived popular behaviour (Borsari and Carey, 2001; Wood et al., 2001). For many students, going away to college is the first experience of being in an unfamiliar environment requiring knowledge of appropriate and relevant modes of conduct. This is a time when students experience a great deal of ambiguity as many habitual behaviours become inapplicable in the new environment (Cialdini and Trost, 1998). The literature indicates that normative influences such as those outlined in section 3.4.2.2 are

heightened under conditions of ambiguity (Cialdini, 1993; Rice, 1993). Normative perceptions of peer behaviours and attitudes therefore become powerful influencers of behaviour during this time of distinct vulnerability as students try to mirror peer norms in their efforts to gain social approval and to be perceived as relaxed and at ease with drinking (Schall et al., 1992; Perkins, 1997; Wood et al., 2001). Violating these norms can make one appear different, which is especially undesirable in social situations.

Borsari and Carey (2001) note two aspects that make the college environment a suitable setting to examine drinking behaviour and relevant norms. First, there is a predominant shift in influence from parents to peers during this time. Peers become increasingly important as students become more independent from parental oversight. Second, the increased prevalence of alcohol based social opportunities during college life adds to the potency of peer influence and makes normative pressures all the more influential.

3.6 Social Norms (SN) Theory

SN theory is based on the idea that our behaviour is guided by what other members of our social groups accept and expect and how they behave (Berkowitz, 2004; Berkowitz, 2005). It means that individuals express or inhabit a behaviour in an attempt to conform to a perceived norm (Perkins, 2002). According to SN theory, our perceptions of others' behaviours and beliefs are often incorrect. These incorrect beliefs often referred to as 'misperceptions' in SN literature, have an impact on our own behaviours (Berkowitz, 2004). SN theory argues that correcting misperceptions can lead to behaviour change for most individuals who will either reduce their participation in the problem behaviour or be encouraged to engage in protective

healthy behaviours (Perkins and Berkowitz, 1986). This has led to the development of a prevention strategy (SN marketing interventions) discussed in detail in section 3.7.

3.6.1 Causes and Types of Misperceptions

Theoretical explanation of the causes of misperceptions draws attention to processes occurring at the cognitive, social and cultural levels (Perkins, 1997). At the cognitive level, humans tend to overly attribute actions of other people to their dispositions rather than to environmental contexts in which the behaviour occurs (Perkins, 2002). This happens because people often lack information to make accurate judgement about the causes of other people's behaviour. Thus, when students observe an intoxicated peer, they tend to think it is characteristic of that individual unless they have a concrete basis to think otherwise (Perkins, 1997). At the social level, extravagant behaviour of an individual or a few people under the influence of alcohol is easily noticed, remembered and given disproportionate weight in subsequent social conversations with peers (Perkins, 1997; Perkins, 2003a). This further exaggerates the perceived drinking norm among students. Finally, at the cultural level, mass media contributes heavily to the production and reinforcement of alcohol related misperceptions through films, television shows and advertisements that unrealistically emphasize heavy drinking as part of youth culture (Perkins, 1997; Perkins, 2003a).

Misperceptions can occur in the form of overestimating or underestimating the norm. However; research informs us that people often tend to overestimate problem behaviours and underestimate healthier norms (Perkins and Wechsler, 1996; Perkins et al., 1999; Perkins and Craig, 2002; Berkowitz, 2004; Berkowitz, 2005). SN theory describes three common types of misperceptions which are discussed next.

3.6.1.1 Pluralistic Ignorance (I think they differ, when they don't)

Pluralistic ignorance is a psychological state which occurs when a majority of individuals falsely assume that most of their peers behave or think differently from them when in fact their attitudes and/or behaviours are similar (Miller and McFarland, 1991; Prentice and Miller, 1993). This is the most common type of misperception. SN theory suggests that most college students drink moderately but incorrectly assume that their peers drink a lot more and do so a lot more frequently than they do (Berkowitz and Perkins, 1986a; Perkins and Craig, 2002; Rimal and Real, 2003; Berkowitz, 2004; Berkowitz, 2005; McAlaney and McMahan, 2007). Pluralistic ignorance encourages individuals to move their attitudes and behaviours closer to the unhealthy behaviours and attitudes which are perceived incorrectly as being normative. It also provides encouragement to suppress healthy attitudes and behaviours that are wrongly thought to be fairly uncommon (Berkowitz, 2005).

3.6.1.2 False Consensus (I think they are as bad as me, so I don't really have a problem)

False consensus, also known as “self-serving bias” refers to the tendency of people to assume that others share their attitudes and behaviours to a greater extent than they really do (Wolfson, 2000). It takes the form of overestimating the frequency with which other people might act or feel in conjunction with one's self and this is especially relevant to behaviours that are viewed by an individual with somewhat uncertainty and conflict (Berkowitz, 2004). Drawing from the above, it represents an individual's denial that his or her attitudes or behaviours are problematic or unusual therefore motivating him or her to believe in these exaggerated norms.

3.6.1.3 False Uniqueness (Not many are like me and abstain or drink less)

False uniqueness refers to the tendency to underestimate the commonality of one's attitudes and behaviours (Suls and Wan, 1987). For example, those students who abstain from drinking alcohol can underestimate the prevalence of abstinence and falsely assume that they are more unique than they really are. This can encourage them to withdraw from the larger community perceiving it to be more alcohol oriented than it really is.

3.6.2 Documentation of Misperceptions

Following the work done by Perkins and Berkowitz (1986), a body of institutional research diverse in region, size and student characteristics has reported similar misperceptions related to overestimations of peer drinking norms (Prentice and Miller, 1993; Beck and Treiman, 1996; Haines and Spear, 1996; Larimer et al., 1997; Page et al., 1999; Carter and Kahnweiler, 2000; Clapp and McDonnell, 2000; Peeler et al., 2000; Thombs, 2000; Werch et al., 2000; Glider et al., 2001; Sher et al., 2001; Fabiano, 2003; Far and Miller, 2003; Haines et al., 2003; Jeffrey et al., 2003; Linkenbach and Perkins, 2003a; McAlaney and McMahon, 2007). Specifically, these studies demonstrate that most students perceived substantially greater use of alcohol among their peers than was the reality.

Further, these misperceptions have been noted for both descriptive and injunctive norms. Borsari and Carey (2003) from a meta-analysis of 23 studies of normative misperceptions conducted in the US report that students overestimated both the drinking norms of prevalence (descriptive) and approval (injunctive) in peer reference groups and that these misperceptions were greater for injunctive norms compared to descriptive norms. The researchers reflect that

one possible explanation for this can be that injunctive norms are based on less direct information in that they are largely unobservable and hence their estimations require greater cognitive inference leading to higher misperceptions. Trockel and others (2003) and Larimer and Neighbors (2003) also report misperceptions of injunctive norms in studies examining fraternity drinking and college student gambling respectively.

Research also informs us that misperceptions are held by all members of campus communities inclusive of undergraduate and graduate students, faculty and staff, students and student leaders (Berkowitz and Perkins, 1986a; Berkowitz, 1997). Likewise, misperceptions have been documented in a state wide sample of young adults in the US both in college and not in college (Linkenbach and Perkins, 2003a) as well as among middle and high school students (Beck and Treiman, 1996; Thombs et al., 1997; Botvin et al., 2001; D Amico et al., 2001; Haines et al., 2003; Perkins and Craig, 2003b). Similarly, Thombs and others (1997) report misperceptions relating to DWI (Driving while intoxicated) and RWID (Riding with an intoxicated driver).

There is only one published study which questions the existence of misperceptions (McAlaney et al., 2011). This study conducted by Wechsler and Kuo (2000) reports that students accurately perceived campus norms for drinking and that there were no underlying misperceptions. However, a number of researchers criticize the study and point out methodological problems (DeJong, 2000; Perkins and Linkenbach, 2003) such as the use of an arbitrary definition of binge drinking and the use of normative belief items which were fundamentally different from the measures of personal behaviour – a consideration which is believed to be of particular importance as will be discussed in chapter 5, section 5.5.6. Further, Wechsler and Kuo (2000) assume one's perceptions of others drinking as being accurate if

within +/-10% of the actual campus binge drinking rate. Dejong (2000) argues that this condition conceals over or under estimates of binge drinking on campus that may be reliable but less than 10%.

The patterns of exaggerated perceptions have also been reported for other behaviours that occur frequently in substance use research such as cigarette smoking (Haines et al., 2003; Hancock and Henry, 2003; Linkenbach and Perkins, 2003b; Perkins and Craig, 2003b), marijuana and other illegal drug use (Perkins, 1985; Hansen and Graham, 1991; Perkins et al., 1999; Pollard et al., 2000; Wolfson, 2000; Perkins and Craig, 2003b). Apart from alcohol, tobacco and other drugs, the evidence of misperceptions has also been documented for a range of other behaviours such as gambling (Larimer and Neighbors, 2003), bullying (Biggsby, 2002; Paluck and Shepherd, 2012), homophobia (Dubuque et al., 2002), eating disorders (Kusch, 2002) and sexual assault (Bruce, 2002).

3.6.3 Consequences of Misperceptions

SN theory argues that when misperceptions are perceived as real, they have real consequences. There is strong and consistent evidence in the literature demonstrating that misperceptions are positively associated with one's own drinking behaviour, including studies of both cross sectional (Perkins, 1985; Wood et al., 1992; Perkins and Wechsler, 1996; Thombs et al., 1997; Nagoshi, 1999; Page et al., 1999; Clapp and McDonnell, 2000; Korcuska and Thombs, 2003; Page et al., 2008) and longitudinal (Graham et al., 1991; Prentice and Miller, 1993; Botvin et al., 2001; D Amico et al., 2001; Sher et al., 2001) nature.

Perkins and Wechsler (1996) from a nationwide study of 17,592 students at 140 colleges and universities in the US report that perceptions of campus drinking climate explained more of the variance in drinking behaviour than any other variable. Similarly, Clapp and McDonnell (2000) report that perceptions of drinking norms prevalent on campus are predictive of drinking behaviour and alcohol related problems. Page and others (1999) demonstrate that overestimations of others' binge drinking is directly correlated with an individual's own rate of binge drinking. A longitudinal study (Sher et al., 2001) reports that perceptions of heavy drinking in the Greek system were largely responsible for the prevalence of heavy drinking among fraternity and sorority members.

The research on the association between normative perceptions and drinking behaviour is not only limited to college campuses but has also been conducted with high school and middle school populations. For example D'Amico and colleagues (2001) in a US based longitudinal study of over 1500 high school students demonstrate that higher peer perceptions of alcohol use are associated with subsequent escalations in personal drinking and that only the perceived intensity of student alcohol use predicts behaviour change.

Just like misperceptions have been documented for both types of norms as has been commented in section 3.6.2, the impact of misperceived norms in predicting personal consumption has also been established for both descriptive and injunctive norms. Early research evaluating the direct effect of injunctive norms on drinking behaviour reports that it is predictive of alcohol use (Wood et al., 1992; Wood et al., 2001). Larimer and colleagues

(2004b) in a US based longitudinal study of fraternity and sorority⁶ students report similar associations between injunctive norms and drinking behaviour at two time points. Borsari and Carey (2003) and Trockel and colleagues (2003) assert that injunctive norms are more likely than descriptive norms to predict drinking behaviour. Larimer and Neighbours (2003) report similar findings with regards to student gambling. However, in general, perceptions of descriptive norms have been found to be more influential than those of injunctive norms, which is part perhaps reflected in the fact that most of the SN research has focused on the former. This issue will be addressed in more detail in section 3.9.

In summary, SN theory suggests that misperceptions exist and that they are associated with one's personal consumption of alcohol. These assumptions of SN theory have been extensively validated by international research as has been discussed in the preceding discussion.

3.7 SN Prevention Strategies for Reducing Alcohol Related Harm

Problems commonly associated with misuse of alcohol by college students have been shown to include property damage, poor academic performance, damaged relationships, unprotected sexual activity, physical injuries, date rape, and suicide (Berkowitz and Perkins, 1986b; Perkins, 1992; Wechsler et al., 1994; Presley et al., 1996; Wechsler and Kuo, 2000). Beck et al (2008) report on the relationship between social contexts and alcohol related problems in a sample of 728 college students. Their findings demonstrate that those students who frequently drink to enhance general well being and conviviality and to facilitate social interaction are

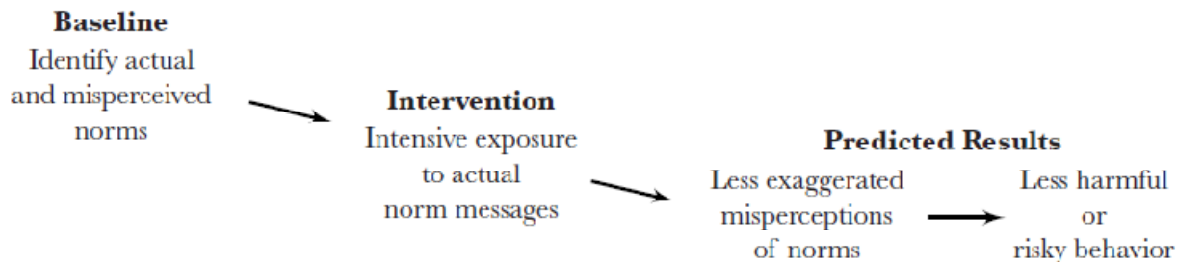
⁶ Fraternities and sororities are club like organizations for under graduate students, common in the American and the Canadian college system. Collectively these are called the 'Greek System' because their names often consist of Greek letters. (Sher et al, 2001)

more likely to ride with an impaired driver, to drive after drinking themselves and to receive an alcohol related housing violation. Similarly those who drink in the context of motor vehicles and emotional pain are likely to suffer from alcohol abuse/dependence and clinical depression respectively.

The predominant approach in the field of health promotion has been to induce positive behaviour change by highlighting risk and emphasizing the negative consequences of heavy drinking often referred to as the 'scare tactic approach' (Berkowitz, 2004). Others have focussed on the development of skills for dealing with inter and intrapersonal social influences and enhancement of personal qualities such as self esteem (Hansen, 1997). However, these strategies have not been effective (Perkins and Craig, 2002).

SN theory was first examined in the context of college drinking by Perkins and Berkowitz (1986) who found that students at Hobart and William Smith Colleges in New York tended to overestimate how heavily and how frequently their peers drank alcohol. This overestimation was found to predict students' own drinking. This foundational study recommended the application of SN theory to reducing drinking on college campuses which led to the development of SN based prevention strategies. These strategies refer to any variety of approaches designed to decrease problem behaviour or increase protective behaviour by reducing misperceptions of healthy norms (Perkins and Craig, 2002). Popularly known as social norms marketing interventions, these campaigns target the discrepancy between reality and perception by first exposing and then shrinking the gap between the two. This has an effect of the target population revising their perceptions downward with their drinking levels (or level of the behaviour being examined) following. Further, this strategy also leads to a decrease in

alcohol related harm effects (Perkins, 2003a). The model of SN based prevention approach (Perkins, 2003a) is depicted below.



Since the land mark study by Perkins and Berkowitz (1986), numerous interventions have practically evaluated whether norm education can change both students’ perceptions of norms as well as their alcohol consumption. SN based interventions utilize social marketing⁷ techniques to deliver norm education in several formats to address universal, selective and indicated prevention or a combination of these (Berkowitz, 2004).

Universal prevention efforts typically combine normative feedback with social marketing techniques to promote actual healthier norms via campus wide electronic/print media campaigns. For example, the SN based intervention at the University of Arizona reports a reduction of 29% in rates of heavy drinking (defined as consuming 5 or more drinks in a sitting in the last 2 weeks) as well as a decrease in negative consequences⁸ resulting from alcohol over the years 1995-98 (Johannessen and Glider, 2003). Some of the other colleges that

⁷ Social marketing is the application of commercial marketing techniques to programs designed to influence the behavior of people in order to improve their personal welfare and that of their society. Andreasen, A. R. (1995). Marketing social change: Changing behavior to promote health, social development, and the environment. Jossey-Bass San Francisco, CA.

⁸ Getting into a fight or argument (decreased from 32.2% to 20.4%), Getting in trouble with campus police or other school authorities (decreased from 17.5% to 6.3%), doing something that later regretted (decreased from 41.8% to 31.2%), been taken advantage of sexually (decreased from 14.7% to 8.3%), doing poorly on a test or important project dropped (decreased from 22.2% to 15.8%), missed class (decreased from 33.5% to 24.7%)

have successfully implemented such interventions include the Western Washington University (Fabiano, 2003), the Northern Illinois University (Haines and Spear, 1996; Haines, 1996; Haines and Barker, 2003), the Hobart and William Smith colleges (Perkins and Craig, 2002; Perkins and Craig, 2003a), the Rowan University (Jeffrey et al., 2003) and the University of North Carolina Chapel Hill (Foss et al., 2003; Foss et al., 2004). These colleges report a reduction of 20% or more in high risk drinking rates within 2 years or more through a social norms marketing campaign. The website of the National Social Norms Center (www.socialnorm.org) keeps detailed data pertaining to these as well as other studies.

Selective prevention measures also use social marketing techniques specifically targeted at particular groups such as first year students or fraternity/sorority members (Berkowitz, 2004). These interventions pioneered at the Washington State University (Barnett et al., 1996; Peeler et al., 2000; Far and Miller, 2003) typically provide norm education to high risk drinkers in small interactive group discussions, workshops or academic classes. Due to their small size and manageable format, many of these interventions assess their effectiveness by randomly assigning students to experimental and control groups (Barnett et al., 1996; Schroeder and Prentice, 1998; Steffian, 1999; Peeler et al., 2000; Far and Miller, 2003). For example, Far and Miller (2003) report a decrease of 29% in students who drink 5 or more drinks on an occasion and an increase of 8% in abstainers over a nine year period. Another selected prevention campaign conducted at the University of Virginia (Odahowski and Miller, 2000) reports that the number of drinks per week for first years went down from 3 to 1, the median number of drinks per week for fraternity first-year men went down from 15 to 7, and the percentage of abstainers went up from 35% to 49% over a period of three years. In a subsequent evaluation of this campaign, Bauerle (2003), reports that the campaign was extended to the entire campus

and that negative consequences of alcohol experienced by first-year students continued to trend downwards.

Indicated prevention endeavours provide personalized feedback to high risk drinkers and abusers as part of individual counselling interventions. These are based on the idea that sharing normative data in a motivational interviewing format is a non-judgemental way to catalyze change. Several studies following this approach report significant reductions of drinking rates in the target population (Dimeff, 1999; Walters, 2000; Borsari and Carey, 2005; Juarez et al., 2006; Lewis and Neighbors, 2007; Lewis et al., 2007; Walters et al., 2007). Borsari and Carey (2005) for example report a 30% reduction in alcohol consumption rates of the participants in a US based study.

3.7.1 Social Norms Marketing Interventions Outside the US

Much of the SN theory and the methodology behind intervention efforts has been developed and tested in the US particularly within the American college system with some work also being done in Canada (Perkins, 2007; Schmidt et al., 2009). However, there are important cultural and legislative differences between the US and other countries especially those of Europe which raised questions about the success of the approach in European colleges. First, the legal drinking age in most European countries ranges between 16 to 18 years (19 in Nordic countries) while in US, it is 21 (Wicki et al., 2010). This means that alcohol becomes available to European students at a younger age in contrast to their American counterparts. Second, large cross-cultural studies among adolescents, such as ESPAD indicate a lower prevalence of

regular alcohol consumption and RSOD⁹ in the US compared to European countries meaning that the prevalence of alcohol use in European freshmen may be higher than among their American peers (Hibell et al., 2012). Third, European universities differ considerably from the American colleges. While American students tend to be members of fraternities, sororities and special athletic clubs, this type of campus life style and the accompanying drinking culture is far less common in Europe (Turrisi et al., 2006). Similarly, most American colleges have a thriving sport culture whereas in Europe, most sporting activities tend to take place in clubs outside of the education system (Wicki et al., 2010). In order to address the concerns related to ecological validity of the approach, normative research efforts began in other countries (McAlaney and McMahon, 2007).

Outside the US, misperceptions of alcohol related norms in peers have been documented in New Zealand (Kypri and Langley, 2003), Switzerland (Bertholet et al., 2011), Germany (Haug et al., 2011), Finland (Lintonen and Konu, 2004), Scotland (McAlaney and McMahon, 2007), England (Bewick et al., 2008), Australia (Hughes et al., 2008), Denmark (Balvig, 2009), France (Franca et al., 2010), Hungary, Romania, Slovakia and the Czech Republic (Page et al., 2008). Kypri and Langley (2003) for example report that in a randomly selected sample of 1564 university students in New Zealand, 80% of the women and 73% of the men overestimated the incidence of heavy drinking among student peers. Similarly, McAlaney and McMahon (2007) examined heavy episodic drinking and normative misperceptions in a sample of 500 students at a Scottish university using a web based survey. The study reports significant correlations between the respondents' drinking behaviour and their perceptions of the

⁹ Risky Single Occasion Drinking

behaviour in others¹⁰ with beliefs of the most proximal peers being the most strongly correlated. In addition, the study also demonstrates overestimations of alcohol use in other students by the majority of respondents.

Although alcohol related misperceptions have been extensively documented outside of US, McAlaney and colleagues (2011) note that intervention based studies outside of the US are more limited in number. Among these studies, the Ringsted Project, an award winning community based initiative reports a reduction of 39% in alcohol use among a group of Danish school children over a period of one year (Ringsted., 2010). Balvig and Holmberg (2011) report on a brief SN intervention targeted at 11-13 year old Danish school children and demonstrate a ripple effect where the correction of misperceptions regarding one type of risk behaviour (smoking) also influenced other types of misperceptions and risk behaviours (alcohol and drug misuse). Following the work conducted in the Ringsted experiment, the approach is being widely used in Denmark (McAlaney et al., 2011). Though this work has not been publicized extensively in English language journals to date, information about this and other Danish endeavours is available on the website of the Danish Centre for SN approach (www.socialpejling.dk).

SNIPE (Social Norms Intervention for the prevention of Polydrug use) is a collaborative research project covering six European countries (Belgium, Denmark, Germany, Slovakia, Spain and United Kingdom) and Turkey (Pischke et al., 2012). It aims to assess the feasibility of delivering a web based personalized SN feedback for substance use to a sample of

¹⁰ The study included three reference groups namely close friends, others of same age at the university and others of same age in the UK

university students from across Europe. The project is currently in progress with the final results to be published in 2013. The scope of this initiative will help examine whether misperceptions of the frequency and perceived acceptability of substance use are shared across cultures. Similarly, EUDAP (European Drug Addiction Prevention) is a Europe wide alcohol and drug education endeavour targeting 12-14 year olds which incorporates social norms marketing (EUDAP, 2010).

In Australia, SNAP (Social Norms Analysis Project) is the first major study to use social norms for reducing alcohol related harm in high school children in rural areas of Tasmania (Hughes et al., 2008). The project reports significant reductions in self reported frequency of drunkenness in the intervention group compared to the control. Another Australian study (Kypri et al., 2009) randomized heavy drinkers into either a control or intervention group and delivered a web based personalized feedback intervention. The study reports that heavy drinkers who received the intervention drank 17% less alcohol than the control participants 1 month after screening and 11% less alcohol 6 months after screening.

In Britain, Bewick and colleagues (2008) report on a web based personalized feedback intervention where the participants (university students) were randomly assigned to either a control or intervention condition. Intervention participants received electronic personalized feedback and norm education through a website they could access by a secure log on procedure. The study reports significant reductions in the alcohol consumption rates of intervention participants.

In contrast to many US based studies the Australian (Hughes et al., 2008; Kypri et al., 2009) and British (Bewick et al., 2008) studies benefit from the inclusion of control groups. It is also

notable that unlike most US based research, studies such as Balvig and Holmberg (2011) and Hughes et al (2008) target school children instead of college students. Balvig and Holmberg (2011) emphasize that prevention can be most effective when intervention precedes the risk behaviour which is why a younger age group is preferable.

Although alcohol misuse and related harm is a serious concern in Ireland as has been discussed in chapter 2 sections 2.2 and 2.3, the applicability of SN marketing interventions has not yet been evaluated in Ireland (More on this in section 3.9.1).

3.7.2 Expansion beyond Academics

McAlaney and colleagues (2011) note that to date most social norms work has focused on student populations although the field has started to rapidly expand into diverse groups and research topics. Studies have examined social norms in relation to effective parenting (Linkenbach et al., 2003), safety behaviours at work (Fugas et al., 2011), community attitudes towards providing support to women who have experienced intimate partner violence (McDonnell et al., 2011), cigarette use and religiosity in a national sample of 12-17 year old American adolescents (Gryczynski and Ward, 2011), biodiversity conservation among Finnish foresters (Primmer and Karppinen, 2010) and paying taxes (Traxler, 2010).

3.7.3 Unsuccessful Interventions

Studies have also been reported where social norms interventions were unsuccessful (Werch et al., 2000; Granfield, 2002; Clapp et al., 2003; Thombs et al., 2004). However, researchers note that most of these studies were flawed by methodological limitations such as the failure to

reduce misperceptions which SN theory informs would yield no behaviour change (Perkins et al., 2005; McAlaney, 2007; McAlaney et al., 2011).

3.7.4 Issues in the Evaluation of SN Interventions

There are certain methodological limitations acknowledged by the researchers to characterize SN literature.

First, norm education is often combined with other components such as discussion of drinking problems, suggestions to reduce alcohol use, skills training and strengthening resiliency (Agostinelli et al., 1995; Barnett et al., 1996; Walters, 2000; Walters and Neighbors, 2005). It is thus not always possible to evaluate the exclusive impact of normative feedback accurately. It is important to be wary of the fact that these and not the provision of accurate norm education may have facilitated the observed reductions in alcohol use in intervention work. Efforts directed at differentiating the effective components in norm education programs that are associated with drinking may be useful in addressing this limitation (Borsari and Carey, 2003).

Second, use of several different referent groups ranging from “your best friend” (Baer and Carney, 1993) to “an average student” (Perkins et al., 1999) makes it difficult to compare different studies. It is likely that these reference groups differ in their degree of familiarity and specificity to the participants. Research has indicated that students' perceptions become more distorted for groups they know less well (Baer et al., 1991; Perkins, 1997). Subsequently, some perceptions may be more factually based (best friend) than others (average student), thus influencing the accuracy and replication of such estimates.

The third limitation relates to the issue of possible question order effects in norm estimation. Research provides evidence that the order in which participants complete personal consumption and normative belief items influences norm estimates (Baer and Carney, 1993; Prentice and Miller, 1993). Borsari and Carey (2001) note that such trends can influence the interpretation of results. Consequently, most researchers conducting survey research have preferred to present the questions on personal consumption prior to those on normative perceptions.

Fourth, most normative research is based on self reported measures of consumption, thus susceptible to possible response bias. This has been addressed by a number of studies that have used breathalyzers. Foss and colleagues (2003; 2004) for example, used actual blood alcohol content measures and demonstrated that the reductions in alcohol use were not due to potential response bias or the possibility that students were guided by the social norms campaigns to exaggerate changes in their behaviour.

The fifth limitation concerns the lack of longitudinal studies in normative research compared to a vast majority of cross sectional research. Cross sectional studies make it difficult to establish causal relationships (Kypri and Langley, 2003). In contrast to the notion that norms precede drinking, it has been argued that at least two phenomenon; namely projection and social selection suggest the opposite (Neighbors et al., 2006). In the former students may simply base their estimates of others drinking on their own consumption in consistency with the aforementioned phenomena of false consensus. In the latter heavy drinkers may self-select into a friendship network with comparable drinking levels to themselves, which can influence personal consumption as well as their perceptions of drinking by peers. There is evidence of

this process occurring in student populations (Kahler et al., 2003; Read et al., 2005). Neighbors and colleagues (2006) address this by examining the temporal precedence of perceived norms and behaviour. Whilst a degree of reciprocal causality was identified, there was evidence that perceived norms were a stronger predictor of drinking behaviour than vice versa.

Finally, the more recent Cochrane review (Moreira et al., 2009) of the SN approach in reducing alcohol misuse in college or university students, identifies the lack of randomized control trials as a potential weakness of normative interventions. As commented earlier, in contrast to many of the existing social norms studies in the US, both Bewick et al. (2008) and Hughes et al. (2008) benefited from the inclusion of control groups. McAlaney and colleagues (2011) note that though these studies did not bring about large changes in drinking behaviours, it is due to the limited time frames of these studies compared to other American studies as mass behaviour change is believed to occur after several years of sustained SN campaigning.

3.8 Criticisms of SN Marketing Interventions

Normative interventions are often subject to scepticism and criticism in relation to the claims they make since they deviate substantially from conventional methods of preventive research. Some of the common concerns that are often raised are reviewed here.

3.8.1 Not Publicizing the Problem

Some critics suggest that SN marketing interventions are doing what they refer to as ‘sugar coating’ the problem by not really pointing out the significant number of students who exhibit problem behaviour thus causing potential harm to themselves and to those around them. The

advocates of the approach argue that SN theory does not trivialize the problem of alcohol misuse among youngsters. In fact, SN research clearly demonstrates that alcohol misuse is a particular problem in student populations (Gill, 2002; White et al., 2006). However, identifying a problem must be considered as a different task from prevention. While acknowledging that problematic behaviour exists, SN interventions focus on accurate presentation of the healthy majority as a way to combat the real problem that exists among a portion of youth (Perkins, 2003b).

3.8.2 Overstating Misperceptions

There is often a concern whether misperceptions exist in such a consistent manner so as to justify designing a prevention strategy around reducing them. There is extensive published literature as has been reviewed in section 3.6.2 which reports substantial misperceptions across a number of problem behaviours in populations that vary in their characteristics. Further, the advocates of the theory argue, that in rare instance when a study failed to find misperceptions, it was mostly because the constructs used to measure personal consumption and perceived norms were not comparable.

3.8.3 Offering Encouragement to Abstainers

Sometimes the question is raised if normative messages can encourage abstainers to take up drinking because it is more normative than they initially thought it was. SN researchers (Perkins, 2003b) argue that those who currently abstain from consuming alcohol do not believe that abstinence is the norm and therefore putting out accurate drinking figures does not expose them to new pressures.

3.8.4 Feasibility in Situations when the Problem Behaviour is the Norm

SN marketing approach to prevention is often criticised in terms of its applicability to situations where a majority of the population exhibits problem behaviour thus making it normative. For example, Ireland is known to have a culture where heavy drinking is seen to be common as explained in chapter 2. The experts of SN approach respond to this by emphasizing that even if the norm is at a higher level of risk than we would want, people still believe that their peers on average engage in a still higher level of risk than the actual norm. Therefore, addressing the misperception is a useful strategy even in such contexts. As commented in section 3.7.1, exaggerated perceptions of drinking norms have been documented and targeted via normative feedback in heavy drinking cultures outside of the US for example the UK (McAlaney, 2007; McAlaney and McMahon, 2007; Bewick et al., 2008).

3.9 Theoretical Gap and Social Need

3.9.1 Applicability of SN Marketing Interventions in Ireland

As has been discussed in chapter 2, sections 2.2 and 2.3, excessive alcohol consumption is a serious problem in Ireland which has led to several social and health consequences. The current policy in this regards has not been highly effective and there is a need to consider alternative strategies to deal with the issue of alcohol misuse in Ireland. It is clear from the research reviewed in sections 3.6 and 3.7 that SN marketing campaigns are an effective strategy to reduce drinking rates especially among college populations. While extensive international evidence supports these campaigns, their applicability is yet to be examined in Ireland. Most of the alcohol related research in Ireland has focussed on other aspects of the

phenomenon. Delaney and colleagues (2008) for example examine gender and ethnic differences and report that the Irish students drink more than the foreign students and that males drink more than females. Another study (Delaney et al., 2007) examines students' perceptions of excessive drinking using statistical vignettes based on an online survey and several focus groups. The study reveals stark heterogeneity in students' perceptions of what is meant by alcohol excess both in terms of their own self rated drinking behaviour and in terms of their general conceptions about excessive drinking. While perceived peer drinking has been found to be an important predictor of personal consumption in a study of 2700 Irish post primary students (Grube et al., 1989), Ireland lacks published empirical work investigating misperceptions of drinking norms.

Given, the high prevalence of binge drinking in Ireland, an uncertainty remains about the applicability of SN approach. As commented in section 3.8, the advocates of SN model argue that the approach should still theoretically work in an alcohol-tolerant context like Ireland (Perkins, 2003a). However, as a prerequisite to any SN marketing intervention aimed at reducing drinking rates, it is necessary to establish that alcohol related misperceptions occur among the Irish college students and impact their drinking behaviours.

3.9.2 The Conceptualization of Norms

One of the weaknesses of SN literature is that while the theory clearly differentiates between descriptive and injunctive norms (Borsari and Carey, 2001; Borsari and Carey, 2003), little attention has been paid to evaluating the relative effectiveness of these norms in influencing drinking behaviour. Several researchers argue that the two types of norms refer to separate constructs that uniquely affect behaviour. Cialdini and colleagues (1990) for example

emphasize that descriptive norms which describe what is typical or normal motivate by providing evidence of what will likely be effective and adaptive action. In contrast, injunctive norms specify what ought to be done through the threat of social sanctions. This distinction between the two types of norms and their unique effects on behaviour is emphasized by a number of theories which describe injunctive norms to play an important role in influencing behaviour. These include the theory of normative social behaviour (Rimal and Real, 2005), the focus theory of normative conduct (Cialdini et al., 1990; Cialdini et al., 1991) and the theories of reasoned action and planned behaviour (Ajzen, 1991).

One of the most consistent works in this regard by Cialdini and colleagues (Cialdini et al., 1990; Cialdini et al., 1991; Cialdini, 1993; Cialdini and Trost, 1998) establishes the effectiveness of feedback based on injunctive norms in behaviours such as littering (Reno et al., 1993) and theft of petrified wood (Cialdini et al., 2006). However, most normative interventions to date have focused on correcting misperceptions related to descriptive norms. Only two published interventions consider manipulation of injunctive norms in interventions aimed at reducing alcohol consumption. The findings are mixed. Barnett and colleagues (1996) report decreases in the perceived approval of alcohol use of close friends and the typical student by both dormitory residents and Greek members. In contrast, Schroeder and Prentice (1998) do not report similar changes at a longer term follow-up of 4–6 months.

While, addressing descriptive norms in interventions has been effective in reducing drinking rates, it is not clear if one of these norm types would be more likely to change behaviour than the other and hence should be the preferred choice in interventions. This is an important

question because it impacts the effectiveness of SN based interventions. This is an area which requires further research.

3.9.3 Norm Salience

A key challenge faced by SN research is the need to understand how and why norms of some reference groups become more influential and salient than those of others. The interest in salience is driven by a need to design tailored normative interventions for particular groups (Berkowitz, 2004). In a comprehensive review of prior research, Borsari and Carey (2001) report the use of as many as 18 different referent groups in SN research ranging from ‘your best friend’ to ‘an average student’.

The literature on norm salience is very generic in nature and focuses on norms pertaining to particular identity groups, based on gender (Lewis and Neighbors, 2004; Lewis and Neighbors, 2006b), fraternity and sorority membership (Baer et al., 1991; Baer, 1994; Larimer et al., 1997; Carter and Kahnweiler, 2000) and athletes (Thombs, 2000). For example, Lewis and Neighbors (2004) in a study involving undergraduate students, evaluate perceptions of gender specific versus gender-non-specific drinking norms. The study reports that gender specific norms tend to be more salient than gender non specific norms. Lewis and Neighbors (2006b) provide empirical evidence that both men and women tend to think of the typical college student as ‘male’ when estimating peer drinking norms. In contrast, McAlaney (2007) reports that female British students interpret the typical student as being the same gender as themselves. There is also considerable research demonstrating that fraternity members often overestimate the drinking of other Greeks but correctly perceive that Greeks drink more than non-Greeks (Baer et al., 1991; Baer, 1994; Larimer et al., 1997; Carter and Kahnweiler, 2000).

It is also well documented in the literature on saliency that misperceptions increase as social distance increases (Beck and Treiman, 1996; Thombs, 2000; Borsari and Carey, 2003; Kypri and Langley, 2003; Berkowitz, 2004; Berkowitz, 2005) but social groups that are closer tend to be more influential in shaping personal behaviour (Borsari and Carey, 2003; Korcuska and Thombs, 2003). Research also indicates that the influence of a referent group on a person is also dependent on an individual's perception of similarity between him or herself and that group (Borsari and Carey, 2003).

Most SN campaigns focus on the norms of a 'typical student at campus' which may or may not be a salient referent group for the population of interest. In case of latter, a SN based campaign cannot be effective (Berkowitz, 2004). From a theoretical point of view, while it is clear that proximal social groups are more influential and that evaluation of salience is imperative to the success of a campaign, in practice, the identification of these groups and their placement in the social networks of individuals remains a key challenge. One particular area of importance for SN research therefore is a better understanding of group identity and how individuals identify salient peers (McAlaney et al., 2011). When asked to report on the drinking of their close friends or typical students, how do individuals decide which friendship groups to draw from and how influential are these groups in determining personal consumption? McAlaney and colleagues (2011) in a recent review of the international development of SN approach, draw attention towards the need to address these questions regarding norm salience which represent an important theoretical weakness.

Social Network Analysis (SNA) which is a set of widely used techniques to map and study relationships in various contexts, offers a unique methodology which can be used to address

the issue of norms salience. However, the utilization of SNA in enhancing our understanding of norm salience remains an unexplored area which requires further investigation (More on this in chapter 4).

3.10 Conclusion

It is important to understand and address the drivers of unhealthy drinking habits among youngsters in order to develop appropriate policy measures to tackle the problem. Social norms represent a core construct of the research on substance use particularly alcohol consumption. SN literature demonstrates that misperceived peer drinking norms play a prominent role in influencing the drinking patterns of college students and argues that correcting these misperceptions can promote healthy behaviours. This chapter reviewed the theory and practice of SN approach by examining the empirical literature on normative perceptions and drinking behaviour. In doing so, some important theoretical and practical issues came to light which provide the impetus and direction for this research. Specifically, the review highlights three key gaps in the literature. First, it points out that SN approach is yet to be tested for its practical application in Ireland where the drinking culture is different and more permissive compared to the US. Second, it draws attention to the relatively little consideration given to the assessment of injunctive or attitudinal norms as compared to descriptive or behavioural norms in most SN studies. Third, the chapter highlights that despite pervasive interest in peer influences and college drinking; SN literature reflects a lack of clarity on how individuals conceptualize salient peer groups. While, past research on saliency has focussed on how different referent groups influence perceived norms, identifying these salient others, locating them in the social surroundings of individuals and determining their relative influence on individual behaviour

remains a challenge. Little consideration is thus given to peer-group structure. It is important that work is undertaken to accurately identify and target salient reference groups because it is an important part of the planning process of a SN campaign (Berkowitz, 2004).

Broadly speaking, the present study seeks to address the question how different types of norms and norm salience influence the drinking behaviours of college students in Ireland. In order to address these concerns, the social context of individuals has to be taken into account which is characterized by the social networks they inhabit. As mentioned in section 3.9.3, SNA offers a unique methodology to study relationships and consequently provide a better understanding of the issue of norm salience. Chapter 4 extends this discussion by introducing SNA, explaining its relevance to norm salience and reviewing related substance abuse research.

4 Literature Review: Social Network Analysis (SNA)

4.1 Introduction

As discussed in chapter 3, section 3.9.3, SN researchers have consistently drawn attention to the importance of understanding the social environments of individuals, so that SN marketing intervention efforts may benefit from focusing on the most salient peer groups corresponding to the population of interest (Berkowitz, 2004; Gorman et al., 2004; Mason et al., 2004; Berkowitz, 2005; McAlaney et al., 2011). SNA offers a way to address this concern because it facilitates studying the social context of substance use behaviours such as alcohol consumption (Ennett et al., 2006).

Social Network Analysis (SNA) is based on the idea that individuals are embedded in thick webs of social relations and that social life is created by these interactions and the patterns formed by them (Borgatti et al., 2009; Marin and Wellman, 2010). Based on the theoretical constructs of sociology, mathematical foundations of graph theory and recent developments in computing technology, it offers a unique methodology for visualizing and examining social structures and relations. The transdisciplinary nature of network science has increased its popularity and growth in diverse fields ranging from ecology and epidemiology to social sciences and business practice (Marin and Wellman, 2010).

This chapter is aimed at introducing SNA and examining how it can be useful in identifying and exploring salient peer relationships that may influence individuals' perceptions of peer drinking and their own drinking behaviours. The chapter begins by discussing issues related to defining social networks and summarizing the history and the current state of SNA. It then

describes three principles implicit in the network theory that set it apart from attribute or group based perspectives. A description of network data, its measurement and related issues is presented next followed by a detailed discussion on the integration of SNA and norm salience. Network research conducted in the specific domain of substance use is reviewed before the chapter concludes with a discussion on specific challenges and common criticisms faced by network science. A glossary of common network terminologies is presented in appendix 9.

4.2 Network Theory

4.2.1 What is Social Network Analysis (SNA)?

A social network can be thought of as a set of socially relevant nodes which are connected by one or more relations (Borgatti et al., 2009; Marin and Wellman, 2010). Nodes (network members) are the units that are connected by various relations whose patterns network analysts study. These can be people, organizations or any units that are meaningfully connected to other units (Wasserman and Faust, 1994). For example, researchers often examine web pages (Watts, 2003), journal articles (White et al., 2004), countries, neighbourhoods and departments within organizations (Quan-Haase and Wellman, 2006). The relationships, connections or linkages between a set of nodes is often referred to as ‘ties’ in network theory. SNA then is a set of theories, method and techniques used to understand social relationships and how these relationships might influence individual and group behaviour (Valente et al., 2004).

4.2.2 Types of Ties

Network analysts study various kinds of relationships or ties for example, collaborations, friendships, trade ties, web links, citations, resource flows, information flows, exchanges of social support or any other possible connection between the nodes (Wasserman and Faust, 1994). Borgatti et al. (2009) divide these different kinds of relationships into 4 basic types namely, similarities, social relations, interactions and flows.

Similarities occur when two nodes share similar attributes such as demographic characteristics, attitudes, locations or group memberships (Marin and Wellman, 2010). Similarities are not seen as social ties in themselves but rather as conditions that increase the probability of forming other kinds of ties and therefore shape social networks. For example physical proximity creates opportunities for interactions which can subsequently create social relations.

Social relations include kinship ties, other types of commonly known role relations (e.g. workmate, friend); affective ties which are based on network members' feelings for one another (e.g. liking or disliking); or cognitive awareness (e.g. knowing) (Borgatti et al., 2009). Killworth and others (1990) for example examine the networks of people "known" by the respondents in their study.

Interactions refer to discrete events which can be counted over a period of time. These are ties based on behaviour such as those an individual speaks to, helps, or invites into his/her home. These usually facilitate and occur in the context of social relations. For example, friends (social relation) give each other advice (interaction) (Borgatti et al., 2009).

Flows are those tangible and intangible things that are transmitted through interactions. These may include relations in which resources, information or influence flow through networks. Like interactions, flow based relations often occur in the context of other social relations and researchers frequently assume or study their co-existence. For example, social relationships such as kinship or friendship can affect the exchange of different kinds of support and companionship (Wellman and Wortley, 1990).

Much of network analysis is concerned with examining one or more of these different kinds of ties among actors or nodes. This typology of ties suggested by Borgatti et al. (2009) is presented in Figure 2.

Similarities			Social Relations				Interactions	Flows
Location	Membership	Attribute	Kinship	Other Role	Affective	Cognitive		
e.g., Same spatial & temporal space	e.g., Same clubs, Same events etc.	e.g., Same gender, Same attitude etc.	e.g., Mother of, Sibling of	e.g., Friend of, Boss of, Student of, Competitor	e.g., Likes, Hates, etc.	e.g., Knows, knows about, sees as happy, etc.	e.g., Sex with, Talked to, Advice to, Helped, Harmed, etc.	e.g., Information, beliefs, personnel, resources, etc.

Figure 2: Typology of ties studied in social networks (Borgatti et al., 2009)

4.2.3 History and the Current State of SNA

SNA finds its roots in several theoretical perspectives because inherently it is an interdisciplinary endeavour. The primacy of relations over atomized units is an idea that is much older than the field which came to be known as SNA. Network theorists find examples of this notion in the works of influential thinkers such as Einstein, Marx, Durkheim, Weber and Goffman (Emirbayer, 1997). The primacy of relations is most explicit in the work of Georg

Simmel who believes that social world is found in interactions and patterns of relationships rather than in an aggregation of individuals. Based on this belief, he argues that sociologists should study patterns among these interactions – which he refers to as ‘forms’ – rather than studying individual motives, emotions, thoughts, feelings and beliefs – which he calls ‘content’ (Simmel and Wolff, 1950; Simmel, 1964; Simmel and Levine, 1971). His theoretical writings have inspired major empirical findings (Boorman and White, 1976; White et al., 1976; Burt, 1995; Burt, 2005) and are often referred to as the ‘Simmelian Roots’ of network analysis (Marin and Wellman, 2010).

The first person to visualize a social network is Moreno. In the fall of 1932, there was an epidemic of runaways in New York at the Hudson School for Girls at a rate that was 30 times higher than the norm. Jacob Moreno a psychiatrist along with his collaborator Helen Jennings mapped the social network at Hudson using a technique called Sociometry which allows graphical representation of people’s subjective feelings towards one another. Moreno suggests that the high rate of runaways had an association with the positions of girls in the underlying social networks that provided channels for the flow of social influence and ideas among the girls (Moreno, 1953). Moreno’s sociograms became hugely popular and the recognition that they could be utilized to study social structures led to a rapid introduction of analytic techniques (Wasserman and Faust, 1994).

In the 1940s and 50s, the field of social networks progressed along several fronts (Wasserman and Faust, 1994). One of these has been the formal use of matrix algebra and graph theory to understand social cognitive concepts such as groups. At the same time experimental studies picked up pace (Bavelas, 1950; Leavitt, 1951; Wasserman and Faust, 1994). During this time

SNA was also being used by sociologists to study the effect of urbanization on communities primarily using an approach called ego networks (Fischer, 1982) which will be explained in detail in section 4.3. A similar study of teenage boys and girls in a Mid Western town indicates that adolescents' behaviour was strongly influenced by the 'cliques'¹¹ or groups to which they belonged (Hollingshead, 2007). The representation and analysis of community network structure remains to this day at the forefront of network research. In 1970s, the theory of social capital (Granovetter, 1973; Coleman, 1988; Putnam, 1993; Nahapiet and Ghoshal, 1998; Portes, 2000) gained immense popularity. The theory reflects the idea that people to whom individuals are connected and the pattern of connections between these people, enable individuals to access resources that ultimately lead them to economic and social benefits (Lin et al., 2001).

By the 1980s, SNA had become an established field with a professional body (INSNA), an annual conference (Sunbelt), specialized software (UCINET) and a journal (Social Networks). Today, it has radiated into a number of disciplines. INSNA members having grown from 177 in 1977 to 1200 in 2009 come from a wide variety of fields such as anthropology, communications, computer science, education, economics, management science, medicine, physics, biology, political science, public health, psychology and others (Marin and Wellman, 2010).

¹¹ Refer to appendix 9 for the meaning of cliques in SNA

4.2.4 The Guiding Principles of SNA

Network analysts make certain assumptions about how best to describe and explain the social phenomenon of interest. These often contrast from conventional social science research in a number of ways (Marin and Hampton, 2007). First, network explanations do not assume that environment, attributes or circumstances affect people or nodes independently. Second, the concept of uniformly cohesive and discretely bounded groups does not exist in network analysis. Finally, network analysts take the *context* so seriously that every so often, relations themselves are analyzed in the context of other relations.

Attributes Vs Relations

One of the key distinctions between social science research and network analysis is that while the former is related to examining attributes, the latter focuses on exploring relations. Attributes refer to the characteristics, attitudes, opinions and behaviours of individuals and reflect the properties or qualities which belong to them as individuals or groups (Freeman et al., 1992). It is common for social scientists to collect attribute data through surveys and interviews and analyse the associations between variables of interest via statistical procedures. Network techniques on the other hand are most suitable for relational data which refers to the contacts, ties and connections relating one individual to another and which cannot be reduced to the properties of individuals themselves.

Networks are Different from Groups

Network analysts must in some way specify the boundaries of networks they wish to study. However; they do not treat network embeddedness as binary, meaning that the nodes are not considered as belonging only to sets of mutually exclusive groups (Marin and Wellman, 2010).

Groups are different from networks in a sense that they are discretely bounded whereas network boundaries are fuzzy. What defines a group is the number of members and their qualities for example employees in different departments, residents of different city districts or members of different school clubs. Marin and Wellman (2010) emphasize that group memberships rarely have a uniform influence on members because some members are more or less committed, more or less tied to other group members, more or less identified with the group or more or less identified by other members of the group. When group memberships are treated as having discretely bounded or mutually exclusive memberships, it overlooks the importance of differing levels of group membership, membership in multiple groups and cross cutting ties between groups (Marin and Wellman, 2010).

A network essentially represents an association of members via connections and thrives on diversity rather than uniformity. A network perspective among other things takes into consideration the strength and nature of connections, the resources that flow between members and the pattern these ties form. Marin and Wellman (2010) propose three advantages of examining groups in this way. First, it allows analysts to consider individuals as being embedded in groups to varying degrees which subjects them to different opportunities, constraints and influences created by group membership. Second, it allows researchers to examine variations in group structure such as which groups are more or less cohesive, which are clearly bounded and which are more permeable. Third, when the question of boundary

definition is left open, it allows researchers to move beyond clearly identifiable groups and study sets of people or nodes that exist at the intersection of various groups. These people or nodes often act as brokers¹² and facilitate interaction between various groups thus structuring social relations, an idea that is frequently visited by network analysts (Brieger, 1976; Feld, 1981; Blau, 1994; Bellotti, 2008) and will be discussed further in section 4.4.3.

Relations in a Relational Context

Those involved in network research study patterns of relationships rather than examining just relations between pairs of people or nodes. Marin and Wellman (2010) reflect that while relations are measured as existing between pairs of nodes, understanding and interpreting the effect and meaning of a relationship between two nodes requires knowledge of the broader pattern of ties within a network. Put simply, network analysts are often interested in examining how A, who is in touch with B and C is affected by the relation between B and C. This is because the nature of relationship between two people can vary based on their relations with others. An example is that of siblings. Wellman and Frank (2001) describe that understanding relations of support, jealousy and competition between siblings requires taking into account the relationship of each to their parents. Similarly, identification of people in brokerage positions who may mediate interactions between different groups requires elicitation of the broader network (Marin and Wellman, 2010).

¹² Refer to appendix 9 for the meaning of brokers in SNA

4.3 Network Data and Measurement

Network data collection is primarily based on the type of networks and relations researchers wish to study. Network literature identifies two different ways of studying networks which stem from two distinct historical traditions (Marsden, 1990) briefly discussed next.

Whole or sociocentric network approach comes from sociology and is heavily influenced by the work of Simmel. It provides a bird's eye view of social structure focussing on all nodes in the population of interest (Marin and Wellman, 2010). It usually begins from a list of nodes and includes data on the presence or absence of relations between each pair of nodes. Well known examples of whole networks are, a network of all workers in a factory showing who plays games with whom (Roethlisberger and Dickson, 2003) and a network of actors appearing on film or television showing who has co-starred with whom (Watts, 2003). Sociocentric techniques are most often used in small communities, schools and organizations where the boundary of the network can be defined (Valente et al., 2004). They often involve looking at an exhaustive map of relationships. Carrying out a whole network study involves challenges related to obtaining data from every member of the population and having every member provide relational data on every other member. This increases respondent burden and may be tedious, time consuming and impractical for many studies (Wasserman and Faust, 2007).

Ego centric or personal network approach arises from anthropology and traces its roots to Radcliffe-Brown among others. Ego centric network data focuses on the network surrounding one node or focal actor known as the 'ego' and a set of people who share specific relation(s) of interest with the ego. These people are generally referred to as the 'alters'. Ego networks are generally elicited through questions focusing on particular relationships (for example, people

with whom an individual plays sports or people with whom an individual shares important matters). Researchers use these questions called name generators to obtain network data. Name generators are generally followed by additional questions called name interpreters which seek other relevant information on the alters. For example, a researcher may ask the respondents to provide the first names of their closest friends and to state whether each of these friends engage in certain behaviours and whether the respondent engages in these behaviours with each friend. (Valente and Vlahov, 2001). Name generators, name interpreters and specific issues associated with them will be discussed at length in chapter 5, section 5.6.

From an ego network perspective, each individual has his/her own network of relationships cut across many groups which contribute to their behaviour and attitudes. The strength of this approach lies in its ability to capture the diversity of social environments surrounding individuals. Amenable to random sampling techniques, ego centric approach typically involves interviewing specific people. Researchers cannot possibly interview each respondent's alters and must rely instead on the respondents to report their relationships with network members and the connections between these network members. These ego networks are then treated as the units of analyses in standard statistical methods. One of the classic examples of ego centric approach is the General Social Survey – an annual population wide survey conducted in the US, which has been using ego centric methods for over 25 years to extract the network members with whom the respondents share important matters (Burt, 1984; Marsden, 1987).

4.4 Integration of SNA and Norm Salience

The norm change strategy grounded in the SN marketing approach offers a potentially powerful method to minimize substance use among adolescents as is apparent from the success of various campaigns discussed in chapter 3, section 3.7. However; SN interventions are impeded by insufficient attention paid to the processes of norm formation and to the identification of salient others whom individuals refer to in developing perceptions about the prevalence and approval of high risk behaviours such as alcohol consumption (Rhodes et al., 1996; McAlaney et al., 2011). The research on saliency in the context of college drinking norms is general and does not provide a comprehensive understanding of the social environment surrounding college students.

SNA is one method of examining norm formation (Latkin et al., 2003) that is argued to expand our current understanding of the ways in which the behaviours of network members influence individual youth (Friedman et al., 1997). This is so because SNA is relationally based and offers techniques to map and visualize peer networks subsequently allowing for the documentation, illustration and identification of how individuals' networks function and how members interact with one another. In addition, network analysis allows direct identification of the structural properties of peer relationships providing a means to examine the patterning of ties in individuals' networks and their relationship with individual and group behaviour (Valente, 2003; Ennett et al., 2006). Reflecting on the above, network analysts often derive explanations of the content and patterns of ties based on the analysis of composition and structure of networks, relevant to their field of interest. The following sections discuss network visualization and how the knowledge about network composition and structure can aid the

identification of salient others in one's social surroundings and evaluate their influence on individual perceptions and consumption behaviour.

4.4.1 Network Visualization and Norm Salience

Network visualization is a key component of analyzing social networks and consists of presenting network information in graphic format. Visual imagery has played a key role in network analysis since its inception. Drawing on the pioneering work of Moreno (1953), most graphic models of networks are presented as sociograms, displaying the relations among network members in two-dimensional space. Members of the network are represented as points or nodes, with lines drawn between pairs of nodes to show a relationship between them. Earlier researchers have argued that points and lines are the most "natural" way to represent social networks (Klovdahl, 1981). There are several practical advantages to visualizing networks in this manner which can improve our understanding of why some norms are more salient than others and how they diffuse through networks. For example, graphic displays of relationships between people convey a vivid image of the network and provide an intuitive understanding of structure and dominant groupings that characterize a network, which might be difficult to achieve in any other way (Streeter and Gillespie, 1993). This graphic representation then allows researchers to ask and answer questions about networks which might not be statistically obvious. Modern network software such as UCINET (Borgatti et al., 2002) incorporates layout and presentation algorithms that facilitate efficient and accurate interpretation of network graphs.

4.4.2 Network Composition and Norm Salience

The analysis of network composition involves examining information related to the attributes of ego and alters. The sort of variables and topics assessed in a compositional analysis can be diverse depending on the nature of research. These might include data on socio demographic characteristics (such as age, gender, ethnicity, religion and so forth), relational aspects (such as role relations e.g. kin, friend and workmate etc., duration of a relationship) and behavioural characteristics (such as drinking behaviour and attitudes). Compositional analysis at the most basic level provides estimates of the size of a particular network determined by the total number of contacts one has in a certain context. Though simplistic, estimates of network size are useful to understanding norm salience in various ways. First, they provide a glimpse of the extent of normative pressures a person might be exposed to. Second, larger drinking networks are associated with higher levels of alcohol use in college students (Farrow, 2009). Third, this knowledge is particularly important for studies examining ‘hidden’ or ‘hard to reach’ populations such as injection drug users so that they may be effectively reached. The assessment of network size makes it possible to measure gross-level descriptors of individuals’ networks, such as the percentage of network members who are male or female, who are family members or friends and so forth. These characteristics provide useful information about the content of networks being examined.

A typical analysis of network composition involves examining the functions a network performs by identifying the type of support or interaction provided by the relationships. This is synonymous with the idea of *transmission* which is the most common mechanism employed in network research and which implies that something flows along a network path from one node

or member to another (Borgatti et al., 2009). Network research often treats network ties as pipelines through which many things flow such as information about jobs (Granovetter, 1973), social support (Wellman and Wortley, 1990), work place identities (Podolny and Baron, 1997), disease (Morris et al., 1995), immunity to disease (Cohen et al., 1997) and knowledge of culture (Erickson, 1996). A compositional analysis can identify various kinds of resources students have access to in their networks. The network literature describes four kinds of possible resources namely social (e.g. companionship), emotional (e.g. advice), instrumental (e.g. borrowing money) and informational support (e.g. assistance with college work) (Burt, 1984; Halgin and DeJordy, 2008). The varying levels of exchange of these resources can provide an explanation of how some members of a network are more salient and important than the others.

One of the strengths of network science is its potential to measure the strength of relationships in a given network (Marsden, 1990). Indeed, all members of an individual's network may not be equally influential in affecting personal consumption (Reifman et al., 2006). Network analysts make use of several indicators that describe the strength of a tie such as frequency of contact, duration of relationship, exchange of support and intensity of a relationship. These indicators may uniquely or in combination define the most salient ties. These indicators provide knowledge about who is important in a network and subsequently aids the identification of salient ties within a network. The Social Ecology Theory (Hansen, 1997) discussed in chapter 3, section 3.3 also supports this by emphasizing that the social units in which individuals spend the most time and which foster greater bonding are more likely to transfer existing normative standards and cause adoption of group norms. This inherent ability of network techniques can make an important contribution to SN theory by offering a way to

evaluate the relative strength of different associations in one's social surroundings and subsequently tease out the most salient ties. A more detailed discussion of the measures of tie strength and related issues is presented in chapter 5, section 5.6.5.2 .

The literature on norm salience suggests that perceptions of similarity increase the saliency of a group to an individual (Berkowitz, 2004). This is referred to as 'homophily' in network terms which refers to the tendency of individuals to relate to people with similar characteristics. Network literature identifies two kinds of homophily. Status homophily is based on informal, formal or ascribed status (such as gender, race, age, occupation, education or behaviour patterns) and value homophily is based on values attitudes and beliefs (McPherson et al., 2006). Analysis of network composition allows one to examine the degree of homophily in a network which provides information about whether a person interacts with others like him/herself. This generates useful insights about the extent of homogenization in a network which is believed to affect the persuasive impact of a message (Valente et al., 2004). This knowledge can have important implications for normative interventions. For example, Visser and Mirabile (2004) in a research involving 4 studies using both experimental and correlational designs explore the implications of being embedded in attitudinally homophilous networks versus attitudinally non-homophilous networks. Their findings demonstrate that people who were embedded within networks made up of like-minded others were more resistant to attitude change when they encountered a persuasive message than were people in attitudinally heterogeneous social networks. Reifman and others (2006) note that similar implications are likely to exist in context of individual drinking behaviour and that of one's network members.

4.4.3 Network Structure and Norm Salience

The structural properties describe the way members fit together to form social networks and a structural analysis is often aimed at uncovering the patterns of relationships within a network (McCarty et al., 2007). This can improve our understanding of salient norms by providing useful information about the connectedness of networks, their structural configurations and the opportunities and constraints associated with different network positions as will be discussed shortly. Network structure is typically examined visually as well as quantitatively through matrix algebra.

The use of matrices has become the dominant and preferred approach in network analysis over the years typically producing algebraic representations of network relations (Streeter and Gillespie, 1993). While a matrix does not stimulate the kind of intuitive understanding that a simple visualization can, it offers important advantages of storing diverse attribute and relational data. This data is typically pictured in varied ways in network visualizations to aid the analysis. Moreover, matrix data facilitates extensive quantitative analyses and is especially appropriate for studying structural properties of relationships. A matrix presents a network in the form of an array of units arranged in rows and columns (Wasserman and Faust, 2007). In a typical network matrix, the rows represent network members and the columns represent the same set of members in identical sequence. Each cell in the matrix contains a number representing the relationship between two members of a network. Binary methods are typically used, with 1 representing a relationship between two members and 0 representing the absence of a relationship. These matrices are then subjected to specific routines in specialized network software generating a range of measures that describe various structural aspects of a network.

As mentioned earlier, an important aspect of structural analysis is to determine the extent of cohesiveness or connectedness between members of a network. Network techniques allow calculation of measures that describe the degree to which a network is connected (Valente, Gallaher and Mouttapa, 2004). For example a dense network indicates that most of a person's friends know each other. Valente, Gallaher and Mouttapa (2004) note that dense or cohesive networks can contribute to diffusion of norms through peer modelling and peer influence. These may also reinforce behavioural norms and increase the effects of prevalence overestimates. Pearson and West (2003) for example demonstrate that the influence exercised by an individual in a social network context increases with the cohesiveness of the individual's social network position and the length of time he or she occupies that position.

Another unique aspect of SNA is its ability to categorize people with regards to their position in a network and to study network shapes. The significance of network position and the ways in which individuals are embedded in their networks has been a frequent topic of discussion in network literature since early days (Granovetter, 1973; Burt, 1995; Burt, 2004; Burt, 2005; Bellotti, 2008) . Network analysts often look towards positions that individuals occupy within their social networks because it allows to them to examine the extent of grouping or clustering in networks. Various terminologies such as 'cliques', 'liaisons or brokers' and 'isolates' are common in the network literature to refer to various network shapes based on positions of their members as will be discussed shortly. Network analysts argue that different network positions a expose individuals to different norms and conventions (Granovetter, 1973; Burt, 1995; Krackhardt, 1999) . Reflecting on the above, clique members, liaisons and isolates might differ in their alcohol consumption and in the influence they exert on others (Ennett et al., 2006).

This can have important implications in the design and evaluation of normative marketing interventions.

Cliques for example are subgroups where all members are connected to one another and are believed to transmit consistent expectations and clear norms (Coleman, 1990; Podolny and Baron, 1997).

Isolates are people who are not connected to anyone in a network. Network research on diffusion of innovation which is primarily concerned with the spread of new ideas in a culture shows that isolates are later adopters of innovations because their position puts them outside the flow of information about new ideas (Rogers, 1995; Valente, 1996). Similarly, being an isolate in a high risk setting offers protection because the individual is metaphorically remote from the negative influences in the group (Valente, Gallaher and Mouttapa, 2004). On the other hand, there is always a chance that isolates are connected to another group outside the boundaries of the network being studied, and this other group may put them at risk (Valente et al., 2004).

Liaisons or brokers are individuals who connect otherwise unconnected or weakly connected groups in a network, thus playing important roles of mediation. The structural hole theory proposed by Burt (1995) argues that an individual who acts as a bridge between people in a social network (A bridge being an individual who is connected to people who are not themselves connected to each other) will be able to negotiate better agreements, extract higher rents and in general have more freedom of choice. This is because he has access to resources that the rest of the group does not. Based on this notion, researchers often suggest that liaisons may be more resistant to group peer pressure because they are not embedded within a

particular group (Valente, Gallaher and Mouttapa, 2004). Thus, in contrast to a bridging position, individuals embedded in densely connected groups such as cliques, are exposed to greater constraints in the form of normative pressures (Valente et al., 2004). Granovetter's work (1973) on the 'strength of weak ties' also points to the advantages of occupying a bridging position though in contrast to Burt who stresses that the strength of a relationship is irrelevant in this equation, Granovetter predicts that weaker ties will more likely be such bridges than stronger ties. A third argument put forth by Krackhardt (1999) differs from Burt in that Krackhardt focuses on the normative power of groups. He argues that if a person A was simultaneously a member of two cliques, then person A will be subject to two sets of norms and though he bridges the two cliques, he will be more constrained by normative pressures from both groups. In consistency with this argument, liaisons may actually be at a greater risk of substance use because they are exposed to norms of two different groups either of whom may support substance use (Ennett and Bauman, 1993). Thus, according to this view the more cliques one is connected to, the more constrained one is because there are more norms to adhere to.

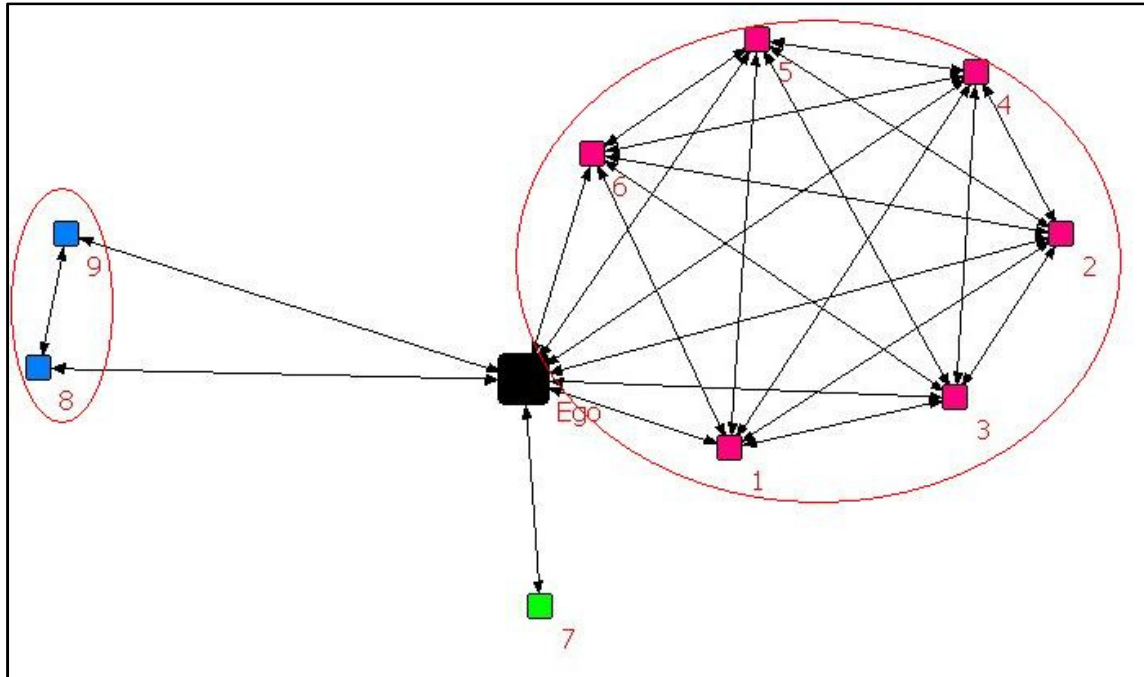


Figure 3: Network visualization showing various positions¹³

For illustrative purposes, Figure 3 shows an ego network of a hypothetical individual indicated by the black node labelled 'Ego'. This individual's network has 8 contacts. The ego is embedded in 2 cliques, which have been encircled. The members in these cliques know each other but there are no interconnections between the two groups. In fact, the ego acts as a bridge between the pink clique, the blue clique and person 7. According to Burt's (1995) point of view, this individual is somewhat constrained because of his membership in cliques however, he is also empowered as he is in a bridging position. However, according to Krackhardt's (1999) interpretation, this individual is embedded in two cliques and hence is most constrained by pressures to comply to the norms of both groups. There is no isolate in this visualization

¹³ This network visualization has been generated with data from the present study

because this is an ego network where everyone is naturally connected to the focal individual (ego). However, if we remove ego from the visualization then person 7 is an isolate because then he will not be connected to anybody in the network.

Network literature provides some guidance on how to resolve this debate. Krackhardt (1999) suggests that in case of private behaviours known only to group members, an individual is free to engage in different behaviours in different groups changing as he/she moves from group to group. In such cases, Burt's argument prevails and being part of different groups is not constraining. However, if the behaviour in question is a public one, then Krackhardt's argument holds that engaging in such behaviours while maintaining bonding with different groups is more constraining.

Social scientists use the knowledge on network positions to develop an understanding of how individuals behave in context of substance use. For example, Ennett and Bauman (1993) apply the network perspective to determine whether adolescents who fill various social positions characterizing peer group structure differ in prevalence of current smoking. They asked 1092 9th graders to name their 3 best friends. With this information the peer group structure was determined by categorizing the adolescents into cliques, liaisons and isolates based on the extent and pattern of their friendship links with others. The study reports that smoking varied by social position with significantly higher rates of current smoking among isolates than clique members or liaisons. A number of other studies focussing on social embeddedness also look at adolescents' social position in the peer networks (Pearson and Michell, 2000; Abel et al., 2002; Fang et al., 2003; Pearson and West, 2003).

Valente (2003) emphasizes that although positions matter because these can lead to persuasive influence by friends, these processes are dynamic and contextual. Therefore, the situational factors that affect individual behaviour and attitudes often need to be examined. More recently, interest in the incorporation of qualitative elements in the design of network studies has grown with the researchers arguing that such study designs can facilitate uncovering and understanding the contextual factors that may be associated with an individual's opinions and behaviour (Martinez et al., 2003). This will be discussed in more detail in chapter 5, section 5.6.

The examination of compositional and structural characteristics of networks and their impact on normative perceptions and drinking behaviours of individuals is a concept which is highly relevant to the study of salient norms and which can make a novel contribution to SN literature. However, to date, it is an area unexplored by normative research.

4.5 SNA and Substance Use Research

As commented in section 4.2.4, most behavioural research in the domain of social science has focussed by and large on individual attributes and characteristics and how they correlate and result in certain outcomes. However; more recently researchers and practitioners have begun to realize the need to study contextual factors such as the physical and the social environment which can contribute significantly to variation in outcomes (Gorman et al., 2004; Mason et al., 2004). This is particularly relevant to substance use related behaviours. Over the years, SNA has emerged as an interesting perspective offering a way to investigate the social context of substance use related behaviours in a transdisciplinary fashion. This section provides a review

of studies that have employed network techniques to study substance use behaviours. Valente, Gallaher and Mouttapa (2004) note that the underlying theoretical basis for this body of research is largely provided by the concept of peer influence and the notion of '*birds of a feather flock together*' embedded in theories of Social Learning, Differential Association and Reasoned Action.

4.5.1 Birds of a Feather Flock Together

This is a simple conception based on day to day observations, meaning that similarity breeds connection. It is popularly believed to structure network ties of every type including marriage, friendship, work, advice, support, information transfer, exchange, co membership and other types of relations (Valente et al., 2004). Within network literature, it is synonymous with the principle of 'homophily', a concept frequently studied by network analysts. Most substance use researchers would concur that people who engage in risky substance use are often surrounded by friends, family members and associates who either do the same or tacitly approve of doing so. The idea that youth tend to cluster together based on shared activities is supported by numerous empirical studies whose findings suggest that an individual's substance use is associated with that of his or her friends for a variety of behaviours such as smoking (Botvin et al., 1993; Aloise-Young et al., 1994; Bauman and Ennett, 1994; Flay et al., 1994; Urberg et al., 1997; Unger and Chen, 1999; Alexander et al., 2001), illicit drug use (Windle, 2000; Rai et al., 2003) and alcohol use (Windle, 2000). Other studies have examined the association between the number of friends who use substances (Donato et al., 1994; Meijer et al., 1996; Wang et al., 1997; Jenkins and Zunguze, 1998) or smoke (Wang et al., 1997) and personal behaviour.

4.5.2 Theories of Social Learning, Differential Association and Reasoned Action

Many argue and perhaps rightly so, that *'birds of a feather flock together'* is a very simplistic notion. In order to understand the mechanisms underlying the clustering of similar peers and provide an adequate explanation, network analysts often invoke the Social Learning Theory (Bandura, 1986). The theory suggests that youth may develop an interest in substance use behaviour merely from observing others apparently receiving rewards for use.

Differential Association Theory (Sutherland and Cressey, 1974) offers a slightly different explanation stating that youngsters learn delinquent behaviour such as substance use from close friends and family who also use substances themselves and/or have supportive attitudes towards their usage. Further, the theory also suggests that associations with substance using peers precede the actual substance use arguing that individuals may not tend to model such risky behaviours from strangers or from impersonal influences.

Theory of reasoned action (Ajzen, 1991) which is also one of the core theories behind the SN approach posits that behaviour is influenced in part by perceived peer norms - a key postulate of the SN approach as has been discussed in chapter 3, section 3.6. TRA is also often referred to in peer influence related network research (Rice, 1993; Rice et al., 2003; Valente et al., 2004). In fact, two network studies examine norm perceptions and their findings are consistent with the SN research documenting misperceptions. Iannotti and Bush (1992) report that though respondents' reports of their friends' substance use did not correlate well with those friends' self-reports, yet perceived norms were better predictors of behaviour than friends' actual use. Along similar lines though not related to substance use, Valente et al (1997) report that women

in voluntary organizations in Cameroon misjudged their friends' contraceptive use and that these perceptions regardless of their accuracy were associated with their own behaviours.

4.5.3 Influence Vs Selection

The theoretical concepts described above assume that youngsters use substances because they are influenced by similar behaviour of peers. However, network analysts studying substance use often argue on the basis of longitudinal research that similarity cannot be equated with peer influence and that adolescents may just select peers based on similar patterns of delinquent behaviour (Valente et al., 2004). As commented in chapter 3, section 3.7.4, this issue of causality is also a matter of concern when evaluating the effectiveness of SN theory which assumes that personal behaviour is influenced by peers. In fact, much of the earlier substance use related network research has been focussed on disentangling influence from selection (Hussong et al., 2001).

In this regards, a number of researchers provide support for peer influence (Bauman and Ennett, 1994; Friedman et al., 1997; Sieving et al., 2000). For example, Friedman and others (1997) from a cross sectional study of 767 drug injectors in New York city report that being connected to a large group of people who used drugs was associated with own drug use. Sieving and others (2000) examine adolescent friendships longitudinally for three years and demonstrate that over time, higher levels of friends' drug use led to increased alcohol use. Some analysts have looked into the alcohol consumption and social networks of couples (Leonard et al., 2000; Homish and Leonard, 2008). These studies provide evidence that a partner's drinking has an influence on one's own drinking during the transition to marriage and through the early years of marriage (Homish and Leonard, 2008).

In contrast, other network research provides evidence of peer selection. For example, Donohew and colleagues (1999) in a longitudinal study conducted over 2 years find that individuals who were high on sensation seeking tended to select friends who were also high on sensation seeking, and were more likely to experiment with alcohol, marijuana, and other substances. Consistent with this assertion, Pearson and West (2003) report findings from three data collection points of a longitudinal study of secondary school adolescents at a Scottish school and suggest that people who became substance users transitioned from belonging to non risk-taking groups to risk taking-groups. The research on married couples also suggests that individuals select social networks which are consistent with their drinking behaviours and that of their partners' (Leonard et al., 2000). The study explains that these social networks which are moderately stable overtime then shape one's drinking patterns.

The majority of network research argues that both the processes of selection and influence are responsible for similarity of substance use behaviour among peers (Fisher and Bauman, 1988; Ennett and Bauman, 1994; Engels et al., 1997; Kirke, 2004; Kirke, 2006; Reifman et al., 2006; Kirke, 2009; Rosenquist et al., 2010). Kandel (1985) provides one of the earliest evidences. In a longitudinal network investigation of high school students the study demonstrates that models which included both selection and influence explained initiation into marijuana use more fully than either factor alone. Ennett and Bauman (1994) use network techniques to study the contribution of influence and selection to cigarette smoking homogeneity in adolescent peer groups. Their work comprises two rounds of data collection and assessment of friendship links and smoking behaviour of 926 8th graders and that of their friends. The results show equal contribution of selection and influence towards similarity in smoking behaviour of the participants and their peer groups. Reifman and colleagues (2006) report similar results in

relation to college students' heavy drinking based on a 3 wave longitudinal study at a large South Western University in the US. Having found the evidence for both phenomenon of interest, the study further addresses specialized issues related to each. It reports that greater presence of network members whom the focal respondent regarded as 'drinking buddies' was predictive of one's own later drinking after having controlled for potential confounds. The study also reports that changes in the overall network drinking over time appeared to be driven predominantly by the dropping and adding of network members.

A recent network study (Rosenquist et al., 2010) provides the most thorough findings in relation to selection and influence. The findings are based on a longitudinal investigation examining person to person spread of alcohol consumption in 12,067 people spanning 32 years. The study uses data from the Framingham Heart Study which is a population based longitudinal, observational cohort study initiated in 1948 to prospectively investigate risk factors for cardiovascular disease. The researchers provide evidence for both selection and interpersonal influence up to three degrees of separation (e.g. a person's friends' friends' friends). Further, the study also reports that changes in alcohol consumption behaviour of an individual's social network had a statistically significant effect on one's subsequent consumption of alcohol. In addition, the study also reports that female contacts were significantly more likely to influence the spread of heavy alcohol consumption behaviour than male contacts.

The most comprehensive work in the domain of social networks and substance use conducted in Ireland comes from a series of articles by Deirdre Kirke based on a dataset collected in 1987. Kirke's work involves total coverage of all adolescents (298) aged 14-18 in one DED

(District Electoral Division) in Dublin County Borough (Kirke, 2004; Kirke, 2006; Kirke, 2009). Kirke (2004) demonstrates from three case studies that youngsters adjacent to each other in peer networks were likely to be similar in their substance use and to form chains of users of similar substances which she refers to as 'chain reactions'. Her work shows that the similarity in substance use among adolescents occurred because of both selection and influence. Kirke (2006, 2009) further explain how chain reactions drew together those who were similar with those who were not and resulted in similarity of substance use among teenagers and their peer groups. The studies also elaborate that gender played an important role in all aspects of chain reactions which involved peer selection, the patterning of peer ties and peer influence. Specifically, the findings indicate that teenagers generally selected same sexed peers, males clustered into large more dense networks than females and male teenagers who were substance users were predominantly influenced by other males while females were predominantly influenced by both males and females.

Other network studies focus on HIV risk and prevention among drug users. Several studies focus primarily on sexual and needle sharing networks and identify risk factors associated with network characteristics (Curtis et al., 1995; Latkin et al., 1995b; Morris et al., 1995; Friedman et al., 1997). Network characteristics that have been found to shape injection risk and behaviour include network size and its cohesiveness (Latkin et al., 1995a; Latkin et al., 2003). Network research also suggests that Greek membership and frequency of discussing particular alcohol related issues are positively related to drinking in excess among college students (Dorsey et al., 1999b).

To date, most network research related to substance use has collected sociocentric data, a (near) complete enumeration of the population of interest as described in section 4.3. This research as is evident from the above discussion has been conducted in both academic and non academic settings.

4.5.4 Prevention Interventions using SNA

Most of the prevention research which utilizes social network techniques originates from the concept of diffusion of innovation (Valente et al., 2004). While diffusion of innovation is mostly related to the transmission of new ideas, researchers often use it to examine the spread of substance abuse. Early research on the diffusion of innovations demonstrates that opinion leaders can be effective health promoters (Valente et al., 2004). Opinion leaders are people who are believed to influence the opinions, attitudes, beliefs, motivations, and behaviours of others. Several studies recruit opinion leaders via nominations from network members and use them to communicate healthier behaviours (Latkin, 1998; Valente et al., 2003; Kelly et al., 2006) . For example, Latkin (1998) recruited street opinion leaders to communicate safe injecting practices and reports that these opinion leaders adopted the safe injecting messages themselves and effectively communicated it to others. In school-based studies, there has been a long tradition of using peer leaders to assist in program delivery (Perry et al., 2002). The teacher typically collects the data, and selects those students as peer leaders who receive the most nominations. Valente and others (1999) expand this methodology to allow students to be assigned to a leader they nominated, or were closest to structurally. Their study demonstrates that the use of sociocentric methods of selection is more effective and appropriate than leaders being popularly chosen but being placed in groups defined randomly.

Though not related to alcohol consumption, a recent study combines the norm change strategy embedded in SN marketing interventions with SNA to reduce problem behaviour. Paluck and Shepherd (2012) examine peer harassment or bullying norms at a small public high school (N= 291) in Connecticut in an experimental study and demonstrate that changing the public behaviour of a randomly assigned subset of student social referents changes their peers' perceptions of school norms and related behaviours. To date, this is the first randomized experiment combining SN theory with SNA which necessitates its discussion. One of the unique aspects of this experiment is that it assesses both types of norms. A social network and norms survey was administered to the entire school. The survey assessed individual's behaviour and their perceptions of prevalence and approval of the behaviour among other students. In addition, the survey also asked the students several (6) name generator questions aimed at eliciting their friendship ties at the school and nominations of high status¹⁴ peers which utilized complete social network and norms survey at three time points. A complete network of the relationships among students at the school was then mapped out. Two types of social referents (1) those who were nominated as being high status and (2) those who received many friendship nominations were then identified. These students were randomly assigned to either a control group or intervention group. The intervention participants were then trained to communicate the campaign message to the entire school during school assembly through skits and speeches. The survey was repeated a week later as well as at the end of school year. The study reports decreases in harassment behaviour and increases in anti-harassment behaviour accompanied by improvements in perceived norms about harassment among students with

¹⁴ Two questions, students 'who you really respect' and 'who you think are most popular' were asked to elicit high status peers.

more ties to intervention social referents. In contrast with past SN studies which typically rely on self reports to assess personal behaviour (McAlaney and McMahon, 2007), Paluck and Shephard's (2012) study assessed personal behaviour and subsequent change by examining school records for disciplinary actions, teacher reports and purchase of a wrist band indicating an individual's support for the anti harassment message. Although this study is experimental in nature and deviates from past SN research in relation to measurement of personal behaviour, it indicates that SNA is a novel perspective which can be incorporated in norm change strategies.

To date, no such study has examined the effectiveness of SNA in SN campaigns aimed at reducing alcohol consumption among youngsters. Some network research in consistency with SN theory acknowledges the fact that pervasive influence of peers can lead to gross inaccuracies in one's social perceptions of what is normative subsequently affecting personal behaviour as described in section 4.5.2 (Iannotti and Bush, 1992; Valente et al., 1997; Valente et al., 2004). However, substance use related network literature clearly lacks studies that examine norms at network level addressing specific rather than generalized referenced others. This brings us back to the fundamental question of which referent groups are salient to an individual or a group of individuals when it comes to behaviour.

4.6 Challenges in SNA

Some general issues bearing on network measurement and study design are presented next.

4.6.1 Boundary Specification

A key issue of importance in the design of network studies concerns the specification of boundaries on a set of units (respondents or nodes) to be included in a network. Network analysts (Laumann et al., 1989; Marsden, 1990) caution that care must be taken in specifying rules of inclusion pertaining to both the selection of actors or nodes for a network and the choice of types of relationships to be studied. This is a concern for both ego network and whole network studies. In both approaches, the analysis relies on the interrelationship of nodes, hence omission of a relevant element or arbitrary delineation of boundaries can lead to misleading results (Barnes, 1979).

Laumann et al (1989), in a review of boundary specification strategies for whole networks, distinguishes between the realist and the nominalist approach. The realist approach is based on the subjective perceptions of the participants and assumes that there is a ‘true’ network of relationships out there which researchers should uncover. The nominalist approach offers a more realistic option of using a-priori conceptual frameworks dependent on the research question. Three procedural tactics are commonly employed by researchers to specific network boundaries (Marsden, 1990). Those based on the attributes of participants consider membership criteria set by formal organizations such as schools (Coleman, 1988), or occupancy of specific social positions deemed relevant by the researcher such as professional communities (Wellman, 1983). The second tactic relates to using social relations to delimit boundaries as in snowball sampling procedures (Erickson, 1979). The last approach involves using participation in certain events as the basis for membership of a network, such as publication in journals (Brieger, 1976).

For ego centric network data, the challenge is to determine the people who should be regarded as part of a given individual's network. Usually, data is collected on direct contacts such as one's friends or one's family. In principle one could also collect data on those who are linked to the participant by one intermediary such as friend of a friend. However, pragmatic pressures tend to restrict the attention of the researchers to direct contacts only (Marsden, 1990). Boundaries for ego networks are typically set via one or more name generators that elicit names of relevant people the participant shares a certain relationship with. These and associated issues will be discussed in more detail in chapter 5, section 5.6.3.2.

A related issue is the type of tie to be examined. In practice, network analysts tend to focus on one or more of four types of ties as described in section 4.2.2.

4.6.2 Respondent Burden

One of the challenges of conducting a network study is related to managing respondent burden. In whole network studies, data about interrelationships between network members is either collected from the network members through survey, observation or secondary data. In ego network studies, structural data is collected from the respondents by asking them about the ties between their network members. McCarty and colleagues (2007) argue that whole network data collection is high on researcher burden, and low on respondent burden because the task of collecting data on interrelationships of members is distributed across the participants who the researcher must observe or interview individually. In contrast, ego network data collection is low on researcher burden and high on respondent burden because the respondents are required to provide the researcher with information related to the attributes of each network member and the presence or absence of a relationship between every pair. This is a key difference.

Researchers address these issues by employing various methods to reduce respondent burden such as asking for fewer alters or collecting detailed relational information on only a few alters chosen from a larger list (McCarty et al., 2007). Each strategy has its own advantages and disadvantages as will be discussed in more detail in chapter 5, section 5.6.3 and researchers are often guided by their study aims in making the choice.

More recently a growing interest in Web-based computer-assisted self-interview (CASI) applications has demonstrated that such methods can present substantial opportunities for personal network data collection (Vehovar et al., 2008). Recent studies (Lackaff, 2010; Lackaff, 2012) employ the web-based Propitious Aggregation of Social Networks (PASN, <http://pro.pitio.us>), a survey instrument which reduces this burden by leveraging network data already available in context of social network websites, and by providing an intuitive click-and-drag interface for survey responses. An experiment conducted on 85 participants using this tool reports producing networks which were significantly larger and more diverse than those produced using standard survey methods, yet required significantly lower time investments from the participants. However, other studies (Matzat and Snijders, 2010) using web based methods report that while such methods reduce costs and interviewer biases relative to face to face data collection methods, they produce lower quality data as a consequence of the respondents answering inattentively, almost mechanically to the questions.

4.6.3 Causality

Determining the exact nature of causal relationships between networks and their effect on an individual's behaviour or perceptions is a challenging endeavor. Fowler and others (2011), in a recent publication argue that four assumptions are critical in making causal inferences on

network data. First, it is necessary to assume that the network members elicited in a study are an appropriate proxy for all the peer influences an individual will receive. Second, identification of peer effects is only possible after assessing network selection based on the principle of similarity or homophily. Third, it is necessary to assume that the respondent will appropriately recall, and truthfully describe, the attributes and behaviours of network members in relation to the area of interest. Fourth, it is necessary to elicit the respondent's contextual influences. A common criticism often raised in relation to observational studies is that unobserved factors can influence the relationship between the respondent and the network members.

Though well designed longitudinal studies can be a suitable way of addressing these concerns, Doreian (2001) notes that “there needs to be a very tight coupling of theory, mechanisms, and credible empirical information before we can delineate the actual operation of causes in the empirical world and before we can tell causal stories” (p111)

4.7 Criticisms of SNA

Within social sciences, network research is subjected to a number of persistent criticisms.

4.7.1 Lacks Theory

The oldest and perhaps the most consistent of these criticisms, is that SNA lacks a theoretical foundation and that it is “merely descriptive” or “just methodology”. Borgatti and colleagues (2009) describe that this criticism has stemmed from several aspects which are central to network theory such as the mathematical sophistication of the SNA methodological toolkit, the

apparent applicability and portability of the concepts to a wide variety of phenomena - just as statistics is applicable to many problems and a tendency among some social scientists to associate all things mathematical with methods. Network analysts (Wellman, 1983; Wasserman and Faust, 2007; Borgatti et al., 2009) argue that it is indeed one of the strengths of SNA that it provides excellent methods and concepts that have been shown to characterize networks and the positions of nodes within them.

4.7.2 Lacks Agency

Another criticism often raised against network research is that it lacks agency in the sense that it neglects subjectivity and human intentionality (Emirbayer and Goodwin, 1994). This argument suggests that network science tends to conceptualize nodes as passive, wholly determined by their positions and environments rather than active agents who are capable of cognition. Borgatti and others (2009) argue that this is a misunderstanding and that a key element of social networks is that the nodes are capable of cognition. People are reflective and projective creatures and this affects how they react to their network positions, and how they change their network positions in pursuit of their goals. For example, within the field of management, researchers have shown that individuals with different psychological characteristics actively construct different kinds of social networks in the workplace (Mehra et al., 2001). This is in line with the work on social capital – the notion that one can invest in one's ties or position and obtain a return on that investment (Burt, 2005).

4.7.3 Ignores Dynamics of Relationships

A third criticism relates to the lack of attention that network researchers are thought to pay to the evolution of networks; how ties form, are maintained, and decay over time. Borgatti et al (2009) argue that while this is overstated and much is known about the principles of tie formation such as the aforementioned management and social capital research, it is also true that the bulk of work in social network analysis has focused on the consequences of networks rather than the antecedents. The advocates of network science argue that this is natural in case of a new field, which must gain legitimacy by showing that it provides new explanations for existing problems before it explores the antecedents of such variables (Wasserman and Faust, 2007).

4.8 Conclusion

SNA is best understood as a perspective rather than as a theory or a methodology (Marin and Wellman, 2010). It is based on the idea that social life is created by relations and the patterns they form. Studying a problem from a network perspective is to study individuals as embedded in a network of relations and seek explanations for social behaviour in the composition and the structure of these networks rather than in the individuals. Unlike a theory, SNA provides us with a way of looking at an issue but it does not predict what we will see.

As described in this chapter, SNA offers a set of powerful techniques to uncover the content and patterning of ties in a given network. This can help addressing the important gap of norm salience in SN literature, which has been repeatedly identified as being crucial to the applicability and success of normative campaigns. The ability to measure large and small scale

attributes of peer relations and provide graphic knowledge of peer group structure is one of the strengths of SNA and an important aspect in developing a comprehensive understanding of the issue of salience. Further, information related to the content and structure of peer groups can also help determining where the most salient referent groups are situated in a network and examining their influence on individual behaviour and perceptions. This is crucial in evaluating the suitability of a norm based marketing campaign in any given setting.

5 Methodology

5.1 Introduction

A detailed methodological review of the procedures adopted in this study and a discussion of how the approach fits the overall research design are presented in this chapter. Specifically, the forthcoming discussion serves four key purposes not necessarily in the same order. First, it formally states the objectives of this research that emerged from the preceding review of literature and that in essence form the *raison d'être* for this study. Second, it describes in detail the research philosophy and design, the instruments and procedures used to collect data, their pre testing, administration, rationale and issues of reliability and validity. Third, it draws attention to some ethical concerns surrounding this study and the appropriate steps taken to address them. Last, it provides a summary of how the data was analysed in this study and also discusses some limitations of the methodological approach.

5.2 Research Objectives

As reviewed in chapter 3, section 3.6, the correction of misperceived peer drinking norms has benefited several health interventions aimed at reducing drinking levels in the American college system. The success of the approach in the US, backed by encouraging results in other countries such as the UK, Denmark and Australia (McAlaney and McMahon, 2007; Hughes et al., 2008; Balvig, 2009; EUDAP, 2010; Ringsted., 2010) has augmented the prominence of SN theory. There is however, no published empirical work examining the application of SN theory to alcohol consumption in Ireland. Given the heavy drinking culture of Ireland and the

associated problems, this seems like a promising avenue for future prevention research and policy making. However, there is an uncertainty about the success of the SN approach in a culture which differs in important ways from the US where much of the normative theory was developed and tested. These include differences in legal drinking age, consumption patterns, and cultural influences. There is indeed evidence that prevalence of heavy drinking is positively correlated with the legal purchase and drinking age (Keller et al., 2009). There are also wider cultural differences in the attitude towards alcohol use and drunkenness in the two countries. Drinking is a key element of Ireland's social life since long as reviewed in chapter 2, making the Irish much more tolerant and permissive in their attitudes towards drinking. This is also evident from the latest comparison figures issued in the global status report on alcohol and health published by the World Health Organization (WHO, 2011) which indicates that the per capita alcohol consumption of adults in Ireland (aged 15 and above) has been consistently higher than the US with the average Irish figures for (2003 – 2005) standing at 13.4 litres of pure alcohol against 8.4 litres of pure alcohol in the US.

The primary prerequisite of any SN marketing intervention is to establish if the norm for alcohol consumption among peers is overestimated by the target population and whether it influences personal consumption (Haines et al., 2004), something which has not previously been established to be the case in Ireland. Although alcohol related misperceptions have been evidenced in similar heavy drinking cultures for example the UK (McAlaney and McMahan, 2007), however, local evidence is necessary and recommended in order to justify a possible SN campaign in any population (Haines et al., 2004). This study serves as a first step to address this broader question in an Irish context. In line with this, the first two objectives of this study are:

1. *To investigate the extent of misperception among Irish students regarding peer drinking norms*
2. *To examine the association of normative perceptions of prevalence with students' own drinking behaviour*

As discussed in chapter 3, section 3.6, previous SN studies have consistently found college students to overestimate the drinking of their peers. If a similar misperception does not occur in the Irish population and predict personal consumption, then this will have serious implications for the applicability of the increasingly popular normative marketing theory in Ireland. Thus the first two objectives of this study aim to establish if students in Ireland do in fact overestimate alcohol consumption on campus, as do their US counterparts. It is hypothesized that this will indeed be the case, that in consistency with past research (Borsari and Carey, 2003; Korcuska and Thombs, 2003), the respondents will overestimate the drinking of other students on campus, that they will perceive their proximal peers to drink more than them and their distal peers to drink more than their proximal peers. It is also hypothesized that the perceived descriptive norms of proximal social groups will be stronger predictors of personal consumption compared to distal social groups.

When considering normative influence on behaviour, it is crucial to distinguish between the 'is' (descriptive) and the 'ought' (injunctive) meaning of social norms because each refers to a separate source of human motivation (Cialdini et al., 1990; Marcoux and Shope, 1997; Rimal and Real, 2003; Rimal and Real, 2005). To date, majority of intervention efforts have been directed at correcting misperceptions related to norms of prevalence (descriptive norms) as described in chapter 3, section 3.9. While this has been an effective method in reducing self

reported alcohol use, it is not clear from existing research if one of these norm types would be more likely to change behaviour than the other and should therefore be preferred in SN interventions. The third objective of this study is aimed at addressing this lack of research directly comparing the prevalence and approval norms in terms of their influence on behaviour. The third objective of this research is

3. *To study the relative impact of injunctive and descriptive norms on drinking behaviour*

In line with the idea that the two types of norms are conceptually and motivationally distinct (Cialdini et al., 1991), it is hypothesized that both injunctive and descriptive norms will be uniquely associated with drinking behaviour. If this does happen to be the case then this will provide a new direction to the existing methods of providing normative feedback to target populations by offering the possibility of incorporating injunctive norm education in practice. This will add novelty to intervention based research and strengthen the SN theory by extending our understanding of the potential roles of injunctive norms as behavioural guides.

Individuals interact with people from different social groups in varied contexts in their day to day lives. These people may have similar or different norms and often share ties of varying intensities with the focal individuals. The preceding review of literature (Cialdini et al., 1990; Cialdini et al., 1991; Berkowitz, 2004; Berkowitz, 2005) points out that some or all of these people in one's social circle may have different levels of influence on one's thoughts and actions. While normative research has tended to provide friends or students at the same college as a referent group, little is understood about how individuals visualize these groups and how salient these groups are to them (McAlaney et al., 2011). As commented in chapter 3, section 3.9.3, one of the challenges that normative research faces today relates to identifying these

influential others in the elaborate webs of social networks surrounding the population of interest and evaluating the relative strength of these different norms in influencing individuals' normative perceptions and their consumption of alcohol. Given that many students at the onset of college are in the midst of developing new social networks, college settings provide an opportune atmosphere in which to further this understanding (McAlaney et al., 2011).

As discussed in chapter 4, section 4.2.4, SNA is a potentially suitable method to address this issue as it is based on the study of relational data. It offers a way to examine the composition and structure of networks surrounding individuals, which has been shown previously to provide useful information about the peer context of substance use (Kirke, 2004; Ennett et al., 2006; Reifman et al., 2006). The fourth and the fifth objectives of this research are aimed at strengthening the SN theory by using network analysis as a potential methodology to study salient norms. Specifically, the fourth and the fifth objectives of this research are

4. *To identify and locate the salient peers in personal networks of students using social network analysis*
5. *To examine the association of personal networks with normative perceptions and drinking behaviour*

It is hypothesized that the use of network techniques will allow extraction of the most salient ties in personal networks of students; that it will be possible to examine the content and evaluate the strength of these relationships and that network structure will provide valuable insight into how drinking behaviours originate, develop and sustain in these networks. It is also hypothesized that individuals' normative perceptions will correspond closely to their personal

networks and that their own drinking behaviours would be largely similar to their network members' and possibly influenced by them.

If these hypotheses are supported, then this will strengthen the SN theory by providing a new direction to the study of norm salience. This will also have important implications for incorporating network science in normative marketing research.

5.3 Research Philosophy

Research philosophy encompasses different research paradigms and clarifies a researcher's position on matters of ontology and epistemology. Ontology is the study of being and reflects one's views on the nature of existence (Blaikie, 2000). Gray (2009) reflects that two opposing ontological traditions dominate the western thought. The first tradition often referred to as the ontology of '*becoming*', places emphasis on a changing and emergent world. In contrast, the second tradition, also known as the ontology of '*being*' stresses on a permanent and unchanging reality which exists independent of human existence and comprises clearly formed entities with identifiable properties. Between the ontology of *becoming* and *being*, it is the latter that has held sway in Western philosophy (Gray, 2009). It is also the latter which provides the foundation for this research.

Underling ontology is epistemology which describes our beliefs about possible ways of gaining knowledge of social reality, whatever it is understood to be (Blaikie, 2000). Crotty describes three epistemological positions in his seminal work (Crotty, 1998): objectivism, constructivism and subjectivism. Only the first two positions are relevant to this research and are discussed further.

Objectivism refers to the idea that reality exists independently of consciousness which means that there is an objective reality ‘out there’ (Johnson and Onwuegbuzie, 2004; Gray, 2009). Objectivism is closely related to the theoretical concept of positivism (Gray, 2009). Researchers taking an objectivist/positivist stance believe that reality can be studied and presented accurately by human knowledge. Further, for positivists, empirical knowledge alone counts as true knowledge. Therefore, positivists commonly make use of quantitative methods as research tools as these are objective and the findings can be generalized and replicated (Teddlie and Tashakkori, 2008).

In contrast, constructivism refers to the belief that truth and meaning do not exist in some external world but created instead by the subjects’ interaction with the world (Gray, 2009). It means that individuals and groups contribute to the creation of their perceived social reality (Tashakkori and Teddlie, 2003). A theoretical concept closely related to constructivism is interpretivism (Crotty, 1998). Researchers taking a constructivist/interpretist stance typically employ qualitative methods as research tools and unlike positivists they look to understand social behaviour and focus on its meaning rather than explain it. While constructivism and objectivism refer to different and contrasting epistemological positions, both are still based on a ‘*being*’ ontology (Gray, 2009).

Researchers have long argued in what has come to be known as the ‘paradigms¹⁵ debate’, whether or not qualitative and quantitative methods can be combined in the same study (Johnson and Onwuegbuzie, 2004). The debate has generated two opposing viewpoints. The

¹⁵ A set of beliefs, values, and assumptions that a community of researchers has in common regarding the nature and conduct of research Johnson and Onwuegbuzie (2004, p 24)

'incompatibility thesis' as the name suggests, argues that the integration of quantitative and qualitative methods is inappropriate due to the incompatibility of the epistemological positions that underlie these methods (Teddlie and Tashakkori, 2008). This idea has been largely discredited because scholars have demonstrated that it is indeed possible to successfully integrate mixed methods¹⁶ in research (Johnson and Onwuegbuzie, 2004). Instead, a *'compatibility thesis'* based on pragmatism is suggested which offers a third choice that rejects the either-or choices from the constructivism-positivism debate (Creswell and Clark, 2007). Pragmatism embraces the consideration of perspectives from both sides of the paradigms debate in interaction with the research question and real world circumstances (Teddlie and Tashakkori, 2008). It is a set of ideas articulated by several people from historical figures such as Dewey (1948), James (1907) and Peirce (1878) to contemporaries such as Cherryholmes (1992), Murphy and Rorty (1990). A pragmatic approach employs 'what works', uses diverse approaches and values both objective and subjective knowledge (Teddlie and Tashakkori, 2008). Tashakkori and Teddlie (2003) formally link pragmatism and mixed methods research arguing that both quantitative and qualitative methods may be used in a single study and that the forced-choice dichotomy between positivism and constructivism should be abandoned. They further argue that the research question should be of primary importance, more important than either the method or the philosophical world view that underlies the method. The general characteristics of pragmatism as described by Johnson and Onwuegbuzie (2004) are summarized in appendix 3.

¹⁶ The class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study. Johnson and Onwuegbuzie (2004, p17)

The present study employs both quantitative and qualitative methods of data collection and analysis (More on this in section 5.4). Philosophically, it is rooted in a pragmatic method and system. It recognizes that knowledge is both socially constructed and based upon the reality of the world we experience, interact and live in. In conjunction with the idea of pragmatism (Johnson and Onwuegbuzie, 2004), the present study is oriented towards solving practical problems in relation to the social norms approach particularly that of norm salience, rather than on assumptions about the nature of knowledge. The focus therefore is on the consequences of research as well as on the primary importance of the research questions and objectives which have been described in the preceding section. It is believed that multiple methods of data collection and analysis will inform the research questions under study.

5.4 Research Design

Study Layout and Population

As described in chapter 1, section 1.2.1, the population for this study comprises full time Irish undergraduate students enrolled at DIT during the academic year 2010-11. A primary difference between the population for this study and those studied in the bulk of American research (Berkowitz and Perkins, 1986a; Perkins and Craig, 2002; Rimal and Real, 2005; Rimal, 2008) relates to the lack of on campus accommodation in DIT. Most American studies have focussed on colleges where students reside in on campus residential halls/dormitories. In contrast, DIT students generally reside in self catering accommodations or their family homes. Further, DIT is scattered across the city centre in 6 different campuses in contrast to most American colleges which have a single campus. Another key difference between the

population for this study and American college populations is the age at which alcohol becomes legally available to students (18 years in Ireland compared to 21 years in the USA). In this regards, the population studied by McAlaney and McMohan (2007) is closer to DIT's population as their study involved a commuter campus based in Scotland (University of Paisley) where a majority of students reside in privately owned accommodations and the legal drinking age is similar to Ireland. However, the University of Paisley differs from DIT in relation to the age¹⁷ and gender¹⁸ composition of its student body.

The present study comprised two waves of data collection. The first wave comprised a campus wide online survey for collecting data related to normative perceptions and personal consumption of alcohol. The primary aim of the web survey was gathering base line statistics on drinking behaviours of DIT students to assess if they overestimate alcohol consumption on campus and whether proximal or distal peer norms are more predictive of personal consumption and hence more salient. The second wave consisted of unstructured in depth interviews with 26 students who had already participated in the web survey. These interviews focussed on collecting ego network data and exploring the functioning of these networks and the meaning behind the ties in order to understand norm salience.

Rationale and Alternative Strategies

The strategy of following a web survey by a SNA component was adopted because the former meets important preconditions to exploring the phenomenon of norm salience. Establishing

¹⁷ Mean age in McAlaney and McMahan (2007) is 28 years compared to 21.13 years in the present study

¹⁸ Gender distribution 65% females and 35% males in McAlaney and McMahan (2007) compared to 43% females and 57% males in the present study

misperceptions of the campus norm and determining which social group (distal or proximal) is more salient to DIT students were prerequisites to the second and the innovative element of this research namely exploring the issue of norm salience via SNA. Therefore, while the web survey and subsequent statistical analysis presented in chapter 6 tests SN theory in an Irish context, SNA combined with a qualitative interpretation of the interviews presented in chapters 7 and 8 builds on this knowledge and explores the meaning and functioning of norm salience in depth.

Some other strategies were also considered in finalizing the design of this study. Among these, mail surveys and pen/paper surveys were considered as alternatives to the web survey. The choice of a web survey as a data collection tool was guided by several aspects. First, several previous studies in normative research have successfully employed online survey methods and found them to be feasible for college based populations (Kypri et al., 2004a; Kypri et al., 2004b; McAlaney and McMahan, 2007). McAlaney and McMahan (2007) which is particularly relevant to this study investigates normative beliefs at a British university using a web survey. Given the cultural similarities, it was expected that a similar methodological approach will also be feasible in an Irish context. Second, studies employing web based methods also report benefiting from lower non response rates and higher quality data at a lower cost than traditional methods (Kypri et al., 2004a; Kypri et al., 2004b). Third, given the dispersed campus structure at DIT (more on this in section 5.6.1.1) and the widespread and regular use of college email system by the students; a web survey was the most appropriate way of accessing the population largely and quickly. Finally, past research also suggests several benefits of using web surveys such as greater perceived anonymity resulting in respondents answering more honestly (Kiesler and Sproull, 1986; Davis et al., 2004) and the

ability to collect data from a large number of participants within a short time frame and at a low cost.

A single stage study was also considered as an alternative strategy to a two stage study. Such a study would have involved conducting a web survey to collect data related to personal consumption, perceived norms and ego networks simultaneously. There were two key problems with this approach. First, while this strategy would have captured the basic features of networks for the entire sample, it would not have been possible to generate as rich and deep knowledge of ego networks as was achieved through in depth interviews. Second, such an approach would have imposed unnecessary burden on the respondents. There is indeed evidence that collecting network data via online tools lengthens the survey, increases the risk of dropping out and affects data quality (Matzat and Snijders, 2010). Further, studies which have collected network data via web surveys (Manfreda et al., 2004; Marin, 2004; Coromina and Coenders, 2006; Vehovar et al., 2008) are not only limited in number but also tend to be restricted in their coverage of topics in order to reduce respondent burden.

A second online survey was also considered as an alternative to in depth interviews. While on one hand this approach would have offered greater coverage of the population, the problems associated with online methods of collecting network data would still have been a concern. Further, the idea of combining in depth interviews with formal network analysis techniques has gradually gained traction in network science as commented in chapter 4, section 4.4.3. Crossley (2010) examines the strengths this interaction offers. He emphasizes that the combination of the two methods not only assists in generating and reproducing the ‘ties’ that constitute a network but also in reproducing various emergent properties such as shared

meanings and norms/conventions which the quantitative tools of SNA are inclined to overlook but which qualitative analysis is well placed to identify and analyze. Bellotti (2008), for example uses standard network techniques and in-depth interviews to reconstruct ego networks of friends and explores the meanings associated with these relationships, the kinds of resources they offer and their development and evolution over time. This approach of combining network analysis with qualitative methods was deemed appropriate because of its ability to tap into the meaning and significance individuals associate with the ties in their networks in addition to uncovering the content and the patterning of these ties. Further, as pointed out by Bellotti (2008), this approach can provide knowledge about the evolution of relationships and their transition from what they represented in the past to what they represent now for the respondent.

The data collection procedures and considerations for wave 1 and wave 2 are discussed in detail in the following sections.

5.5 Wave 1: The Web Survey

5.5.1 Questionnaire Design

The formulation of any questionnaire to be used in a survey is an integral part of the research design process. Several aspects have to be considered depending on the nature of investigation. The research on survey methodology (Oppenheim, 2000; Cohen et al., 2007) draws attention to the key elements that should be addressed in questionnaire design. At the most basic level, important decisions have to be made about the purpose/objectives of the questionnaire, the population and the sample to be chosen, generating the concepts and constructs that need to be addressed and the data that is required therein. These choices are guided by the aims of the

study and the theories to be investigated. The questionnaire used in this research was based on the knowledge from a large body of SN research reviewed in chapter 3 and the specific research objectives and proposed hypothesis presented in this chapter in section 5.2.

With regards to the measures used in the questionnaire, closed ended questions were preferred instead of open ended questions. Cohen and colleagues (1983) describe that closed questions are useful as they are quick to complete and straight forward to code compared to word based data generated from open ended measures. These features render them amenable to statistical techniques of analysis. Further, although several kinds of open, dichotomous or multiple choice questions can be used in surveys, methodological research suggests some caveats about the framing of questions (Cohen et al., 1983; Oppenheim, 2000). Specifically, it is recommended to avoid leading, complex and ambiguous questions in the surveys. In keeping with these principles, clear and simple language was used in the survey with no indications or suggestions of an acceptable or a more favourable answer to any of the questions.

The initial questionnaire was subjected to cognitive interviewing to improve the quality of questions and the design of survey (more on this in section 5.5.2) followed by a pilot study for further fine tuning (more on this in section 5.5.3). The final questionnaire was designed and launched using an online survey host website after reviewing several similar platforms as described in section 5.5.5.

5.5.2 Cognitive Interviewing

In April 2010, three under graduate final year students from DIT Aungier Street filled out a pen and paper survey followed by a debriefing session. This approach popularly known as

cognitive interviewing served as a quick way of refining and improving the quality of the initial questionnaire. Cognitive interviewing has emerged as one of the prominent methods for identifying and correcting problems with survey questions since the 1980s (Beatty and Willis, 2007). What began through an interdisciplinary effort by survey methodologists and psychologists has generated a body of methodological research (Jabine, 1984; Dippo, 1989; Campanelli et al., 1991; Jobe and Mingay, 1991; Esposito and Hess, 1992; Willis, 1994; DeMaio and Rothgeb, 1996; Campanelli, 1997; Sirken et al., 1999; Willis et al., 1999; Willis, 2004).

The aforementioned research identifies cognitive interviewing as involving administering the draft survey questions and collecting additional verbal information about the survey responses. This information is largely used to evaluate the quality of responses and to determine whether the question is generating the information that the researcher intends (McColl, 2006). Verbal information is either generated through explicit follow up questions (probes) from an interviewer or based on general instructions to ‘think out loud’ as much as possible with little or no intervening by an interviewer (Willis, 1994). While the ‘think out loud’ approach has the benefits of an open ended format and being free from interviewer induced bias, it requires substantial subject training and places the burden of intensive thinking on the respondents which may result in divergence onto irrelevant tangents. On the other hand, advocates of a more probing-centred paradigm argue that probing provides focus and that carefully selected probes help to concentrate attention on relevant issues (Willis, 1994; Willis, 2004). Willis (2004) further suggests that the use of non leading probes as is recommended for most interviews can minimize the interviewer induced bias in such methods.

In line with the discussed literature, the cognitive interviews conducted as part of this research were aimed at capturing respondent elaborations regarding how they chose their answers, what they interpreted the questions to mean and whether they found any difficulties in answering the survey questions. This technique was useful in two ways. First, it incorporated the opinions of students which helped in adapting the questions to suit an Irish context for better understanding and second, it identified ambiguous or confusing questions and unrealistic response options which were amended accordingly for the pilot study.

A point worth elaborating is the recruitment of just three participants for these interviews. This is not unusual in cognitive interviewing research. Practitioners generally acknowledge that participants for such interviews are chosen by convenience and that these interviews are not intended to be representative of any larger population, but to reflect the detailed thoughts and problems of the few respondents who do participate (DeMaio et al., 1993).

5.5.3 The Pilot Study

The term pilot study is used in two different ways in social science research. Sometimes it refers to feasibility studies which are small scale versions, or trial runs, done in preparation for a major study (Polit-O'Hara and Hungler, 1997). On other occasions, a pilot study entails the pre-testing or 'trying out' of a particular research instrument (Baker and Risley, 1994). In this case, the latter was the main goal. The importance of pre-testing or piloting is paramount in establishing that the design of the questionnaire works in practice and in identifying and amending problematic questions and refining the instrument (Lancaster et al., 2004). Lancaster and colleagues (2004) emphasize that problems relating to the content, wording, layout, length, instructions and coding can be uncovered and dealt with by conducting pilot studies.

The pilot study for this research comprised 102 students enrolled at DIT Aungier street campus who completed a web survey through eSurveyspro.com between 4th April and 8th May, 2010. The pilot survey was not extended to the wider DIT in efforts to minimize discussion of the topic prior to the actual launch of the final web survey. The students were recruited instead from pre selected modules through invites sent via their module instructors. They were briefed online about the survey being part of a doctoral study related to drinking habits of young people and were assured of confidentiality and protection of their identities. The pilot study was useful in several ways. First, it helped to test the online format of the questionnaire and identify inadequacies in design. Second, an optional feedback section asked participants if they had any difficulty in answering the questions, if there were particular questions that confused them and if they had any general comments or suggestions to offer. This assisted in further fine tuning of the measures used. Third, it helped in testing the survey website itself for various features such as ease of use, maximum responses allowed, reporting, data storage, retrieval and options of importing the data into statistical packages. Last, the results of the pilot data were found to be consistent with those from the final survey thus providing confidence in the reliability of the measures.

One of the limitations of a pilot study as indicated by researchers (Baker and Risley, 1994; Peat et al., 2002; Lancaster et al., 2004) concerns the problems arising out of data contamination. Researchers agree that pilot data must not be included with that from the actual study (Peat et al., 2002). The obvious concern is that if there are problems with the research tool and modifications are made based on the findings of pilot study, then the data can be flawed or inaccurate. In keeping with this literature, the pilot data was not included in the main study.

Another common problem is the inclusion of pilot study participants in the main study. Here the concern is that such participants have already experienced the survey instrument and therefore may respond differently from those who have not previously experienced it. This issue has long been recognized by the literature and a 'run in' period is generally recommended when pilot participants are to be re-recruited for the main study (Lancaster et al., 2004). The duration of these periods will differ depending upon the nature of the research being conducted. In keeping with these guidelines, the pilot study and the main web survey were spaced by 6 months which is roughly equivalent to two academic semesters. Less than 2% of the final sample had previously participated in the pilot study. As a further precaution, an indicator variable was used in SPSS to keep track of the pilot respondents through their student numbers. Their responses in the main survey and the pilot study were compared on the variables of interest (specifically, control variables, normative belief items and self reported personal consumption items) but no discrepancies were observed.

5.5.4 Sampling for the Web Survey

Since actual norms are typically based on the average drinking behaviour of students (Rimal and Real, 2003; Rimal and Real, 2005; McAlaney and McMahon, 2007; Perkins, 2007), some homogeneity in the student group is important for a reliable and consistent figure. The study was therefore limited to one third level institute so that the normative influences would be generally consistent across the sample. Specifically, DIT was selected because it simplified several aspects of data collection from gaining access to students to the possibility of conducting follow up interviews if required. A sample of DIT students was obtained via an online survey between 2nd November and 25th November, 2010. Assistance was sought from

the Public Affairs office at DIT which has access to a complete email directory of current students. An email invitation was sent to all registered students in DIT on behalf of the researcher explaining the purpose of study, the confidentiality arrangements and a link to the online survey. In order to maximize the response rate, participants were offered a chance to win an iPad by entering a draw. Past research provides evidence of higher response rates with the use of an incentive (Ryu et al., 2006). 60% of the responses were received within the first two days and by the end of the first week, 85% of the responses had been obtained. One week later, a reminder was sent out with the assistance of the Campus Life Office, responsible for providing several integrated services to students at DIT such as health, sports, counselling services, career advice and student support. The web survey link was placed on the website of Campus Life Office in the 'What's Useful' section which updates students on the most recent happenings on campus. The website is accessed by DIT students on a regular basis for checking emails and accessing several student services such as time tables and registration updates. This generated another 15% of the responses in the following 2 weeks. 2115 completed responses were returned. The final sample size that was subjected to analysis, comprised only full time undergraduate students (N=1700) (More on this in chapter 6, section 6.1). The total population of students at DIT is approximately 20,000 of which, 10,625 registered as full time under graduate students in the year 2010-11 (HEA, 2012), yielding a response rate of 16%.

5.5.5 Evaluation of Online Survey Tools

Several online tools were evaluated for the preparation and launch of the web survey with the search narrowing down to three options namely SurveyMonkey, eSurveyspro and

SurveyGizmo. SurveyMonkey, though was found to be a popular online hosted survey tool, worked well only for basic surveys. The free version offered only 10 questions and 100 responses per survey with little customization and no options for download of reports or data import. Only the higher end options offered advanced features such as question/answer piping (using previous answers in later questions) and integration with SPSS.

eSurveyspro was tested in the pilot study. The free version though offered reasonable features such as unlimited surveys with unlimited questions and responses, basic piping and customization; it did not allow direct import of the data to SPSS or Excel which left the impractical and time consuming option of manual entry thus increasing the chances of data entry errors. A lot of time was subsequently spent on cross checking the data entries in the pilot study to ensure that these were error free.

The final web survey was prepared and launched via surveygizmo.com which was found to have several advantages over the aforementioned options such as ease of use, direct imports to SPSS and Excel with prior coding, basic piping and fully customizable survey look and feel. Further, it offered a free student plan for researchers (upon provision and verification of a valid college email address) which supported all features of higher end advanced packages. Although the student plan allowed 1000 responses per month, the plan was flexible and provided an option to get the overflow in responses unlocked and thus prevent any data loss. In addition, the email support system was found to be very helpful and swift in resolving any issues pertaining to the preparation and launch of the survey or handling of data.

5.5.6 Measures

The measures that were used in the final questionnaire and the modifications and amendments that were made along the way are described next. Please refer to appendix 5 for the final questionnaire administered in the web survey. The details, sources, rationale and amendments (if any) made in each measure are included in a spread sheet attached as appendix 2.

5.5.6.1 Control Variables

Several known predictors of personal consumption as informed by the literature were used in the study. Past research has found age (Jones et al., 1992; McAlaney and McMahon, 2007), gender (McAlaney and McMahon, 2007; Rimal, 2008), year in college (Perkins, 2002), age of first drink (Real and Rimal, 2007), money available for drinking (Connolly et al., 1992; Darmody et al., 2005; Bellis et al., 2007), drinking group size (Cutler and Storm, 1975; Demers et al., 2002), communication about alcohol (Dorsey et al., 1999a; Jamison and Myers, 2008) and living arrangement (Jones et al., 1992) to be associated with personal consumption.

Age was coded as a categorical variable in the pilot study (see appendix 4 for pilot questionnaire). 4 response options were provided namely, 18-21 years, 22-25 years, 26-29 years and 30 or above. However, the pilot analysis revealed that using a specific value of age where possible is more useful, realistic and practical for the analysis. Hence in the final questionnaire, it was included as an open ended numerical variable.

Gender was included as a dichotomous variable coded 1 for males and 0 for females.

Year in college was included as a 6 point variable coded 0 for 'less than 1 year' to 5 for '5 or more years'.

Age of first drink was included as a variable with 9 response options coded 0 for ‘never had a drink’, 11 for ‘11 years or younger’ through to 18 for ‘18 and above’. Based on feedback from the pilot survey, an explanatory line ‘other than just a sip’ was included in the final questionnaire for clarification.

Money available for drinking in a typical week was an 8 point variable having response options ranging from ‘€ 20 or less’ to ‘more than € 140’ with an increment of € 20 in each step. For simplification, the variable was coded by choosing the midpoint for each category. Based on the feedback from the cognitive interviews, an explanatory line was included in brackets to facilitate the choice of an appropriate response option. The final question was phrased as

How much money is available to you in a **typical** week for drinking? (Related costs such as food and taxis included)?

Drinking group size was included as a variable with 5 response options in the pilot questionnaire namely ‘Alone’, ‘1’, ‘2-3’, ‘4-9’ and ‘10 or above’ based on Demers and others (2002). Further, it was contextualized into two questions querying one’s drinking group size on a ‘weekend night’ and when the respondent had ‘college the following day’. However, it was also felt that contextualizing the measure caused confusion to the students and did not add any usefulness to the analysis. Also, based on student feedback, narrower response options were provided in the final questionnaire. Thus, the final measure comprised a single question phrased as ‘How many people do you usually drink with on a typical occasion?’

The composition of drinking group was measured with a single matrix type question which required participants to select all peer groups they usually drank with. The possible options to choose from included one’s boyfriend/girlfriend, class mates, flat mates, friends from college,

friends from outside college, work mates, neighbours, siblings, parents and other relatives. This question helped in formalizing the strategy for wave 2 of the study, as described in section 5.6.

Living arrangement was a categorical variable with 3 response options; ‘I am living with parents’, ‘I am living in a shared accommodation’ and ‘I am living independently and alone’. A fourth option was added in the final questionnaire namely ‘I am living with partner and/or dependent others’.

The pilot questionnaire examined *Frequency of communication about alcohol* by first asking a general question about how often one communicated with the different people they drank with.

How frequently do you communicate with the people you typically drink with? Please select the appropriate answer for all categories that apply to you.								
	Less than once a month	Once a month	Twice a month	Once a week	Twice a week	3-4 times a week	5-6 times a week	Everyday
Boy Friend / Girl Friend								
Class Mates								
Flat Mates								
Friends from college								
Friends from outside college								
Work Mates								
Neighbours								
Siblings								
Parents								
Other relatives								

This was followed by a series of questions inquiring how often one had talked with the chosen people about specific drink related topics in the past month. 6 topics were included based on Dorsey and colleagues (1999a) namely, safer sex practices, effects of drinking too much alcohol, unwanted sexual advances caused by drinking, binge drinking, physical violence, injuries or fights and feeling sick as a result of drinking. This was a matrix type question which is reproduced next.

Think about the past month. Approximately how many times have you spoken with the people you typically drink with about “The Effects of Drinking too much Alcohol”?

Please select appropriate answers for all categories that apply to you.

	Never	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Boy Friend / Girl Friend							
Class Mates							
Flat Mates							
Friends from College							
Friends from outside college							
Work Mates							
Neighbours							
Siblings							
Parents							
Other relatives							

The question was repeated for all 6 topics.

Respondent feedback indicated that the measure caused confusion, required students to do a lot of thinking and often returned partially completed and doubtful responses as students perceived their selves to be reflected negatively if they reported discussing certain topics.

Based on this feedback, the final questionnaire included two questions which are reproduced below

1. How frequently do alcohol/drinking **usually** come up in your conversations with others?

2. How often in a **typical** week do alcohol/drinking come up in your conversations with others?

Such items on peer communication have been administered in prior studies such as Real and Rimal (2007). These questions were accompanied by an explanatory note highlighting that the question meant casual day to day conversations.

5.5.6.2 Personal Consumption

A variety of measures have been used in the past research to assess personal consumption over varying time intervals. One approach is the daily diary or the recent recall methods that require participants to record their alcohol intake on a daily basis or over a specified time period respectively (Carney et al., 1998; Morrison et al., 2003). Although some researchers argue that it is the most accurate approach to record drinking, it is one of the most challenging to apply requiring substantial commitment and motivation from the respondents (McAlaney, 2007).

The QF (Quantity-Frequency) measures typically ask respondents to indicate their frequency of alcohol consumption and the quantity of alcohol they drink. QF methods, of which there are many, usually inquire about “average” or “typical” consumption patterns, usually over a specific time period. A variation of QF measures inquires about each major alcoholic beverage type (i.e., beer, wine, hard liquor) consumed over a certain time period and then summing across beverage types (Rimal and Real, 2003; Rimal and Real, 2005). The QF approach is not without reviews and critiques of associated problems (Polich and Kaelber 1985; Room 1990; L.C. Sobell and Sobell 1992). While, the QF approach cannot capture un-patterned fluctuations in drinking, researchers agree that it is most useful where information needs are limited to a

rough estimate of typical drinking and where knowledge of atypical drinking is not required (Allen and Columbus, 1997; Poikolainen et al., 2002).

The GF (Graduated Frequency) approach is based on the quantity-frequency method but it is more complex and provides greater details about patterns of personal consumption. It measures the quantity and frequency of drinking and, in contrast to the QF approach, also measures the variability in drinking behaviour. For example

‘How many times in the last month have you had 3 alcoholic drinks or more?’				
Everday	2 – 3 days a week	Once a week	2 – 3 times a month	Once a month or less
‘How many times in the last month have you had 5 alcoholic drinks or more?’				
Everday	2 – 3 days a week	Once a week	2 – 3 times a month	Once a month or less
‘How many times in the last month have you had 7 alcoholic drinks or more?’				
Everday	2 – 3 days a week	Once a week	2 – 3 times a month	Once a month or less

Source: McAlaney (2007)

The GF measures are the recommended method of choice for most purposes by WHO (Stockwell and Chikritzhs, 2002). This however, is more of a concern in measuring binge drinking (McAlaney, 2007), as it has been noted that when asked to report average intake over a past period respondents tend to ignore occasional episodes of heavy consumption (Gruenewald and Nephew, 1994; McAlaney, 2007).

The test-retest reliability of both QF and GF measures has been found to be good (Poikolainen et al., 2002). Although the GF measure escapes many of the limitations that befall other QF methods, it is at the expense of a much longer administration time (Allen and Columbus,

1997). By far, the most widely used method of measuring alcohol consumption in normative research is the QF method (Wood et al., 1992; Baer and Carney, 1993; Baer, 1994; Perkins, 2002; Rimal and Real, 2003; McAlaney and McMahon, 2007; Perkins, 2007; Real and Rimal, 2007; Rimal, 2008). Additionally, Bloomfield and colleagues (2003) note that in countries where drinking is typically frequent and regular, a simple questionnaire asking how often and how much people drink (i.e., a quantity/frequency index) may correctly measure most of the consumption.

In light of the above discussion it was deemed reasonable to use the QF measures in this study.

Respondents were asked to estimate how much and how often they typically drank. In addition, the students were also required to estimate their frequency of drunkenness. This was done to allow for heavy episodic drinking and to compensate for any under reporting of alcohol consumption.

The personal consumption measures used in this study are a modified version of McAlaney and McMahon (2007) and McAlaney (2007) who examine personal drinking behaviour, normative beliefs and expectations in a sample of British college students. Given the similarities between the British and the Irish cultures, it was thought reasonable to follow a comparable research design and a similar measure of consumption to allow for a comparison between the results as has been done in chapter 6, section 6.5. The questions in the original study (McAlaney and McMahon, 2007) were phrased as:

How many days in a typical month do you normally drink alcohol?								
Never or very rarely	Less than once a month	Once a month	2-3 days a month	Once a week	Twice a week	3-4 days a week	5-6 days a week	Everyday

How many alcoholic drinks would you normally drink during a night out in a pub or club?								
0	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15 or more

How many days in a month do you drink enough alcohol to become drunk?								
Never or very rarely	Less than once a month	Once a month	2-3 days a month	Once a week	Twice a week	3-4 days a week	5-6 days a week	Everyday

Based on respondent feedback from the cognitive interviews and the pilot study, three modifications were made to the initial set of questions.

One, in the measure for frequency of drinking, the response option 'never or very rarely' was modified into 'never'.

Two, in the measure for quantity of drinking, standard measures for beverage types as prevalent in Ireland were provided for better estimates. For simplicity, an explanatory line

stating ‘Remember, 1 pint is the equivalent of 2 drinks; all other beverage is the equivalent of 1 drink each’ was added to each of the personal consumption and the normative belief items.

Three, the original study (McAlaney and McMahon, 2007) inquired about the number of drinks consumed in a pub/club during a night out for the measure on the quantity of drinking. The feedback from cognitive interviews suggested that this was confusing as the general consensus among these students was that most drinking during a night out takes place at what they call ‘pre drinking sessions’ generally arranged at a friend’s house before heading out to pubs and night clubs. Note that the commonality of this trend was later confirmed by the qualitative accounts from the in depth interviews. The pilot questionnaire provided three contexts in this measure and inquired about the number of drinks one had on a ‘typical drinking occasion’, a ‘typical weekend night’ and a ‘typical college night (when you have college the next day)’. The descriptive analysis did not show much variation between drinking on a ‘typical occasion’ and on a ‘weekend’ and as such did not add any value to the measure. Hence, the item pertaining to weekend drinking was dropped in the final questionnaire which simply asked respondents to report the number of drinks they would have on a ‘typical occasion’ and on a ‘college night’.

5.5.6.3 Perceptions of Prevalence (The Descriptive Norms)

SN researchers argue that measures of descriptive norms on a questionnaire must have certain characteristics to be valid and reliable (Perkins, 2003a). Specifically, two conditions must be considered. Firstly, the items querying personal consumption must be paired with corresponding perceived descriptive norms’ items and secondly, the perceived descriptive norms’ items must be as closely worded to the personal consumption measures as possible. If

these conditions are not met, any reported discrepancy between personal and perceived behaviour may simply be an artefact of the questionnaire design. Further, Perkins (2003a) emphasizes that items measuring perceptions of descriptive norms should be simple focusing on key aspects of personal consumption so that the respondent may reply quickly and without extensive cognitive consideration.

A related aspect is the social distance between the respondent and the referent groups examined. As commented in section 5.2, this study examines the norms of both distal and proximal social groups to evaluate the variability in perceptions and their subsequent impact on drinking behaviour. It is also one of the unique aspects of this research as very few studies have examined both distal and proximal social groups within the same study (McAlaney and McMahan, 2007).

In keeping with the above discussion, the questions on personal consumption were repeated to measure respondent perceptions of peer drinking for 5 peer groups namely most students at DIT (distal peers), close friends (proximal peers), best friend (proximal peers), mother and father. The choice of ‘most students in DIT’ as a distal referent group, instead of the more commonly used term ‘typical student’ was guided by the need to establish as realistically as possible, the extent to which students misperceived the norm on campus (DIT).

5.5.6.4 Perceptions of Approval (The Injunctive Norms)

Past studies on collegiate drinking have mostly conceptualized injunctive norms as the perceived social acceptability of drinking. For example some studies have (Rimal and Real, 2003; Rimal and Real, 2005; Real and Rimal, 2007; Rimal, 2008) asked respondents if they perceived that different social groups (such as most people in general, society in general and

the university administration) consider ‘having a drink or two four or more nights a week’ as socially acceptable. In contrast, other more recent studies have used multiple items to assess approval of specific drinking behaviours (LaBrie et al., 2010; Lewis et al., 2010). For example Lewis and colleagues (2010) examined the perceived acceptance for a range of alcohol use and negative consequences (15 items) from less severe (e.g., drinking to have fun) to more severe (e.g., driving a car after drinking) drinking behaviour.

The former may not be equally useful in context of a culture like Ireland where drinking is known to be socially acceptable. The latter may be accompanied by concerns of longer administering time and possible respondent fatigue. Therefore, the most appropriate measure was deemed to be the one which is quick to consider and assesses not the social approval of drinking but the social approval of heavy drinking conceptualized as ‘drinking to get drunk’, a colloquial term frequently used by college students in Ireland. The injunctive norms were thus assessed by querying whether individuals’ peers would approve of their drinking to get drunk. The question was repeated for the 5 peer groups mentioned in the preceding section and two contexts namely, approval in general and when one had college the next day.

5.5.7 Reliability and Validity

Reliability reflects the ability of a research instrument to yield the same results on repeated trials (Oppenheim, 2000). One method of determining the reliability of empirical measurements is the test-retest approach in which the same test is given to the same people at two points of time (Cohen et al., 2007). Reliability is then estimated by examining the consistency of responses between the two tests. Another way is to estimate the internal consistency (Cronbach α) of items within a construct. It reflects how well various items

complement each other in measuring different aspects of the same concept (Cohen et al., 2007).

Validity defines the degree to which a research instrument measures what it set out to measure (Oppenheim, 2000). There are several types. *Construct validity* (subdivided into convergent and discriminant validity), examines the degree to which the test measures the construct it was designed to measure (Neuman, 2005). Convergent validity occurs when measures of constructs that are expected to correlate do so whereas discriminant validity occurs when constructs that are expected not to correlate do not, such that it is possible to discriminate between them (Neuman, 2005). *Content validity* occurs when the research instrument provides adequate coverage of the subject being studied (Litwin, 1995). Its determination is principally judgemental and intuitive which cannot be expressed numerically. It can be determined by a panel of experts who can judge the extent of the measuring instruments' standards (Litwin, 1995). *Criterion validity* examines the ability of a measure to predict a variable designated as a criterion (Neuman, 2005). Sub divided into concurrent (other criteria assessed simultaneously) and predictive validity (predicting future or past events), it is typically expressed as the coefficient of correlation between test scores (Litwin, 1995). *External validity* occurs when research results can be generalized to and across population, settings and times whereas *Internal validity* occurs when conclusions related to cause and effect can be made (Proctor and Capaldi, 2008).

The present study relied on self reports of students' alcohol consumption. Much research about alcohol related issues in the college environment relies on self-reports of students' alcohol use (Sobell and Sobell, 1995). The validity and reliability of self reported alcohol consumption has

been studied extensively. Consequently, a substantial body of empirical research shows that self reports are accurate proxies for objectively measured behavior both within (Midanik, 1988; Harrison and Hughes, 1997; Johnston, 2001; Brener et al., 2003; Lintonen et al., 2004) and out-with (Ramo et al., 2011) the alcohol consumption domain.

The present study utilized QF measures of self reported alcohol consumption the reliability (test-retest) and validity (content, construct and criterion) of which is evidenced in prior psychometric research (Romelsjo et al., 1995; Sobell and Sobell, 1995; Rehm et al., 1999; Room, 2000). The ecological validity of these measures is also established in similar (McAlaney and McMahon, 2007) and different settings (Perkins, 2007). The present study estimated the internal consistency reliability of personal consumption measures by examining the Cronbach α . The Cronbach α for the three items on personal consumption was found to be 0.735 which demonstrates good reliability.

The reliability and validity of SN measures (perceptions of descriptive and injunctive norms) is an important and complex issue in the field created in part because these measures tend to be tailored to the target population they are being used with. It also represents an under researched weakness of the field. However, in general several studies show participants' estimates of the amount of alcohol consumed by their peers to be highly correlated with their own drinking (Wood et al., 1992; Perkins, 2002; Kypri and Langlely, 2003; Linkenbach and Perkins, 2003a; Neighbors et al., 2006; McAlaney and McMahon, 2007; Perkins, 2007). In accordance with theory and past research, the current study also found high correlations between items of personal alcohol consumption and perceived norms (chapter 6, section 6.3) thus demonstrating construct and criterion validity. In addition, the present study found modest correlation

between descriptive and injunctive norms ($r = 0.28$ or less) indicating that these constructs are conceptually distinct. It adds to the evidence supporting the discriminant and convergent validity of descriptive and injunctive norms as has been noted in prior research (Grube et al., 1986; White et al., 1994; Sheeran and Orbell, 1999; Ravis and Sheeran, 2003). Hierarchical multiple regression procedure utilized in the present study revealed that perceived descriptive norms contributed a substantial proportion to the variance¹⁹ in personal alcohol consumption after several known confounding factors had been taken into account. This strengthens the evidence of concurrent validity of the descriptive norm measures used in the study. The high values of Cronbach α for both descriptive and injunctive norm measures ($\alpha = 0.772$ and 0.756 respectively) provide confidence in the internal consistency of these measures.

The sample for the web survey was found to be representative of full time undergraduate student population at DIT in terms of gender and age. The information about student enrolments and demographics was obtained from the Higher Education Authority (HEA, 2012). Chi square goodness of fit analysis revealed no significant differences between the sample and population on these factors ($p > 0.01$). Further, literature on issues related to non-response (Miller and Smith, 1983; Lindner et al., 2001) suggests that non-respondents tend to be similar to late respondents in responding to surveys. In keeping with this literature, the participants who responded to the first email invitation to the web survey within a week (responses received till 8th Nov, 2010) were labelled as early. Similarly, those who responded to the reminder invitation to the survey (responses received on or after 9th Nov, 2010) were

¹⁹ Perceived descriptive norms explained 20% of the variance in frequency of drinking in a typical month, 33.4% of the variance in number of drinks consumed on a typical occasion and 20.9% of the variance in frequency of drunkenness in a typical month. Detailed results can be found in chapter 6, section 6.4.

labelled as late. Independent sample t tests were performed to compare early and late respondent groups on key variables (attached as appendix 6). No significant differences were found between early and late respondents indicating that the findings of the web survey can be reasonably generalized to the population. The aforementioned tests and subsequent findings strengthen the external validity of the present study.

The design of this study is cross sectional in nature which is why conclusions of cause and effect cannot be made with certainty. This limits the internal validity of the study (More on this in section 5.9.1).

5.6 Wave 2: In Depth Interviews

5.6.1 Sampling and Related Issues

5.6.1.1 Campus Structure at DIT

The Dublin Institute of Technology (DIT) was established officially in 1993. It was constituted from six higher education colleges of the City of Dublin Vocational Education Committee (CDVEC) (Duff et al., 2000). These colleges, located in the city centre both south and north of the River Liffey, had provided applied and higher vocational education in the areas of technology and business for over a century and in their new form came to be known as DIT. While plans are underway for the consolidation of DIT to a new premises located at Grangegorman, to date the institute comprises 6 separate campuses it originated from. The following map shows the location of these campuses around the Dublin City encircled and marked in red.



Figure 4: Location of DIT Campuses around Dublin City

The following table describes the distribution of various academic disciplines across these campuses

Aungier Street Campus	College of Business
Kevin Street Campus	College of Sciences and Health
Bolton Street Campus	College of Engineering and Built Environment
Cathal Brugha Campus	College of Arts and Tourism College of Sciences and Health
Mountjoy Square Campus	School of Art and Design School of Social Sciences and Legal Studies
Rathmines Campus	College of Arts and Tourism

Table 1: Colleges at DIT

5.6.1.2 Recruitment of Subjects

Participants for the second stage of this study were recruited from the Aungier Street campus, which is one of the largest campuses of DIT. The choice of campus was aided by a preliminary analysis of the data from stage 1. Three key results provided impetus for selecting Aungier Street campus. One, 32% of the sample from stage 1 came from the Aungier Street campus making the response rate from this campus the highest among all. Two, descriptive analysis suggested that the gender distribution among the respondents from this campus (as extracted from the main sample) was quite balanced (48% male Vs 52% female) as opposed to other campuses. The Bolton Street and the Kevin Street for example are primarily male campuses with the analysis reporting 87% and 70% males respectively whereas the Cathal Brugha Street and the Mountjoy Square campuses are predominantly female with the survey reporting 71% and 75% females respectively. These results were generally consistent with the records of the registrations office at DIT. The Rathmines Road campus only comprised 1.6% of the sample and was therefore not considered for stage 2. Last, the actual drinking norm at the Aungier Street campus as deduced from the self reports of respective respondents was consistent with the actual drinking norm of the main sample for all three dimensions of alcohol use. The following table shows the mean values for all campuses.

	Frequency of drinking (days in a typical month)	No. of drinks (typical occasion)	Frequency of drunkenness (days in a typical month)
Main Sample	4.91	8.68	3.26
Aungier St	5.06	8.65	3.44
Bolton St	5.12	10.21	3.47
Kevin St	4.51	8.49	2.76
Cathal Brugha	5.01	7.74	3.29
Mountjoy	4.66	7.24	3.24

Table 2: Mean alcohol consumption across DIT and individual campuses

Based on these findings, it was inferred that the attributes specifically gender and drinking rates of the respondents from this campus best depicted the main sample.

Next, 545 potential people from Aungier Street campus were categorized into three cohorts according to their drinking intensity. This categorization was based on Beck and Treiman (1996) which provides a criteria of low, moderate and heavy drinking individuals. The following table presents the categorization schema as laid out in the original study.

	Frequency of drinking	No. of drinks (per occasion)	Frequency of Drunkenness
Low intensity drinkers	Once a month or less	2 drinks or less	Never get drunk
Moderate intensity drinkers	Exceeded low intensity drinkers on one or more of these items but did not meet the criteria for high intensity drinkers		
High intensity drinkers	Once a week or more	5 or more drinks	Once a month or more

Table 3: Drinking Intensity Criteria (Beck and Treiman, 1996)

Two modifications were made to ensure consistency with the response options provided in the web survey and appropriateness within an Irish context. The frequency of drunkenness for low intensity drinkers was classified as ‘once a month or less frequently’ as opposed to ‘never’ and that for high intensity drinkers as ‘once a week or more frequently’ as opposed to ‘once a month or more’ in the original study. These amendments were considered necessary because the original study was carried out in the US where the criterion for low, heavy and moderate drinking might not necessarily be the same as in Ireland which is known to be quite tolerant of alcohol use and drunkenness. These modifications were made in the light of Delaney and Harmon et al (2007), a mixed methods study conducted by University College Dublin on the perceptions of excessive drinking by Irish college students.

	Frequency of drinking	No. of drinks (per occasion)	Frequency of Drunkenness
Low intensity drinkers	Once a month or less frequently	2 drinks or less	Once a month or less frequently
Moderate intensity drinkers	Exceeded low intensity drinkers on one or more of these items but did not meet the criteria for high intensity drinkers		
High intensity drinkers	Once a week or more	5 or more drinks	Once a week or more

Table 4: Drinking Intensity Criteria for the Current Study

Further, those who met the criteria on any one item for high intensity were also classified as high intensity drinkers e.g. someone who drinks 2-3 days a month, consumes 9 drinks on an occasion but believes that he/she never drinks to get drunk was also classified as a heavy drinker.

5.6.1.3 Sample Size

6 email lists of potential participants were prepared based on random sampling. The invitations to take part in the interview were sent out to one list at a time followed by a reminder email a week later. A total of 26 interviews were conducted between 28th January and 17th Feb, 2011. The cessation of interviews occurred in response to theoretical saturation. Specifically, after the 20th interview, there was saturation in the topics where additional interviews were producing the same themes and material regarding drinking norms and their development and sustainment in students' networks. A related point is that the goal of these interviews was not to reach statistical representativeness but to understand the functional aspects of the ego networks and examine how the composition and structure of networks contributed to the formation and dissemination of drinking norms within them.

Small samples like this are typical of qualitative studies, where the goal is not to reach statistical representativeness but to explore theoretical aspects of a social phenomenon (Curry et al., 2009). For example, Bellotti (2008) is a qualitative ego network study of a non representative sample of 23 single youth in Italy. Carpentier (2007) and Grosser (2010) are other examples of qualitative network studies with non representative small samples of $n = 49$ and $n = 30$ respectively.

5.6.2 The Ego Network Approach

As discussed in chapter 4, section 4.3, most social network data collection can be classified as either 'whole' or 'egocentric' networks. For the stage 2 of this research, the egocentric approach was deemed more suitable for two key reasons. One, whole network studies are

based on the assumption that actors be regarded for analytical purposes as bounded social collectives (Marsden, 2005). This means that a network has boundaries which are known a priori such as all members of an organization, all students in a college etc. The only reasonable boundary that could have been used in this study was the college itself. It's not only difficult but also impractical to study all possible ties in a sample as big as this let alone within a college of more than 20,000 students. The egocentric approach focuses instead on a set of selected individuals or 'egos' where each person has his or her own network of relationships that may traverse to different groups. These relationships contribute to an individual's behaviour and attitudes (Christakis and Fowler, 2009). Two, students socialize and communicate with a range of people who might not necessarily be from within the college settings. In fact, one of the matrix type questions on the web survey required respondents to select the people that they typically drink with given 10 peer group choices as explained in section 5.5.6.1. In response to this measure, 86% people reported having friends from outside college among the people they typically drink with. This finding supports the choice of egocentric approach as being appropriate in the current context. The strength of egocentric analysis lies in its ability to capture such diversity of a social environment which is not only relevant but perhaps critical to develop an understanding of how and why some ties are more relevant and salient in a person's network.

5.6.3 Interview Design

5.6.3.1 Settings and Protocol

Participants were contacted by email which they had provided during the online survey to set up a convenient time for an interview. Each interview lasted anywhere between an hour and a

half to two hours. The participants were advised to bring along their student cards for identification. All interviews were conducted at DIT Aungier Street campus in pre booked rooms and audio recorded in Audacity® (Mazzoni and Dannenberg, 2011), a software application that allows digital recording of sound. The basic format and sequence for the interviews is presented below.

1. The overarching aims of the research and related ethical concerns (section 5.7) were addressed in a 10 minute discussion preceding the actual interview.
2. The name generators were administered as will be explained in section 5.6.3.2.
3. Permission was sought to audio record the interview and an opening cue prompted the participants to talk about the people that they named in response to the name generator questions as will be explained in section 5.6.5.
4. Towards the end of the interview, the participants were required to fill up the adjacency matrix (section 5.6.5.1) and an alter attribute chart (section 5.6.3.3). Finally, a short activity comprising a concentric circles diagram as will be described in section 5.6.5.2 concluded each interview.
5. The participants were offered a cash incentive of € 15 each for their participation in the interview.

5.6.3.2 Name Generators

The technique for gathering data on personal networks generally consists of using a *name generator*, which is a tool that uses a question(s) to produce names of people who share a particular relation with the participant (Carpentier and Ducharme, 2007). Name generators can

emphasize different aspects of a network (e.g. friendships, resource flows, information flows, exchanges of social support), but the social-support perspective is the one most often used. Researchers describe social support as an interactive process through which emotional, instrumental, or financial assistance is obtained from one's social network (Wasserman and Faust, 2007). Depending on the name generator and the selection criteria utilized (e.g., people one takes advice from or people one plays sports with), the network will assume a different size, form, and content. Since it is not possible for a researcher to study all contacts in an individual's social surroundings, the name generator technique offers a way to extract "a fraction of respondents' social contacts" who are relevant to the research question (Marsden, 2005).

The key considerations then are to decide on the number of alters to be elicited, the use of one versus multiple name generators and the choice of a criteria in generating alter names.

McCarty and colleagues (2007) suggest that free recall of 25 alters will capture the same structural pattern as a network of 45 alters. For most ego centric studies where the focus is on eliciting strong ties, free recall questions that place no definite upper limit on the overall network size have been found to be generally useful (Ferligoj and Hlebec, 1999; Carrasco et al., 2008).

While administering a single name generator has the benefits of saving time and reducing respondent burden, researchers examining the quality of network data argue that the use of multiple name generators where possible is the preferred method of choice in most cases (Marin and Hampton, 2007; Bidart and Charbonneau, 2011). This is because the use of a single name generator induces people to remember the most obvious people whereas it may be

relevant to prod memory into searching for significant persons not easily remembered (Bidart and Charbonneau, 2011). For example, an individual may not be able to recall relevant ties because they live far way or because the individual hasn't seen them for a long time.

The choice of criteria in a name generator is generally based on the nature of study. For example two classic studies on ego networks use name generators identifying people with whom the focal actor "discussed important matters with in the past 6 months" (Burt, 1984) or with whom he or she "frequently socialized with" (Fischer, 1982). Many others follow suit. On the whole, research indicates that people are generally better at recalling typical or routine relationships and interactions than they are on transactions that occur within highly specific time frames (Marsden, 1990).

In light of the above discussion, the following name generators were administered in this study.

1. From time to time people discuss important matters with other people. Who are the people with whom you discuss matters important to you? Give me their first names and last initial.
2. Who are the people you really enjoy partying/socializing with? Give me their first names and last initial.
3. Please list anyone who is especially close to you, who you have not listed in one of the previous questions. Give me their first names and last initial.

Naturally the outcome of such questions is dependent upon the habits of sociability in a particular culture (Ruan, 1998; Bidart and Charbonneau, 2011). Given the magnitude and

significance of drinking in the social life of Ireland, it was expected that these name generators will elicit significant alters relevant to the phenomenon of interest i.e. drinking behaviour.

5.6.3.3 Name Interpreters

Name generators are generally followed by a series of ‘*name interpreter*’ questions designed to elicit information about the network members such as their attributes, properties of the relationship they share with the ego and their ties with other named alters (Wasserman and Faust, 2007). One of the key considerations in designing and administering name interpreter questions is to balance respondent burden and the information sought (Marsden, 2005). An important decision that needed to be made in this regards relates to whether the number of alters examined in the name interpreter questions be limited or not? The General Social Survey (Burt, 1984) and McCallister and Fischer (1978) elicited alter data for only the first 5 and 8 people named respectively as a concession to time constraints. Burt’s reasoning for this is quoted:

“Somewhere between the time saving choice of asking too few names and the unacceptably time consuming choice of asking too many names, is that number of alter names which reaches the border of the respondent’s interpersonal environment to reveal social heterogeneity. We do not know where this point is ...With no guide other than common sense, I expect the corresponding upper limit to be a single digit number. There is evidence to suggest an upper limit of five to seven (e.g. Miller (1956) and Simon (1974)). In the interest of increasing measurement precision and decreasing measurement bias - under a severe time constraint - the five alter limit proposed for seems judicious.” (p 315)

In context of the current research, it was deemed adequate to collect information on all alters for two reasons. First, the studies mentioned above, were questionnaire based. Guided by methods adopted in the past research (Bellotti, 2008), it was anticipated that the conversational nature of the in depth interviews and the opportunity to ask for clarifications will make the process less burdensome for the participants. Second, the Irish love of drinking and conversation is, of course, proverbial and has earned them a reputation as one of the most talkative and entertaining folk (Haining, 2003). The pilot interviews revealed that having an hour or two of conversation related to one's social circle and drinking was not by any means boring for the participants. Further, it was the beginning of the semester; students were generally relaxed with no impending projects or class assignments that required immediate attention.

In order to maintain the natural flow of conversation and avoid unnecessary disruption, the name interpreter items related to basic attributes of the alters (age, gender, occupation, city of residence, relation and time known) were presented to participants in the form of a chart at the end of the interview. Most participants were able to complete the chart fairly quickly.

5.6.4 Interview Structure

In depth interviews are generally divided into three categories based on the degree of structuring and the degree to which participants have control over the process and content of the interview: structured, semi-structured, and unstructured interviews (Fontana & Frey, 2005, Cassell, 1980; Morse, 2002).

A *structured interview* is an interview that has a set of predefined questions, administered in the same sequence and the same wordings to all the participants (Corbetta, 2003). This standardization is intended to minimize the effects of the instrument and the interviewer on the research results and is essentially similar to surveys except that structured interviews are administered orally rather than in writing. There is an obvious danger of introducing rigidity in the interview following this technique by adhering too closely to the predefined format and subsequently being unable to incorporate appropriate probing (David and Sutton, 2004). Consequently, themes unrelated to the interviewer's focus may not emerge.

Semi-structured interviews are more flexible. Though channelled by an interview guide, the interviewer has a certain amount of room to adjust the sequence of questions to be asked and to add questions based on the context of participant responses. Corbetta (2003) describes that within each topic, the interviewer is free to establish his own style of conversation by conducting the dialogue as he thinks fit, asking the questions he deems appropriate and requesting clarification if the answer is not clear.

5.6.4.1 Pilot Interviews

The flexibility offered by unstructured interviewing technique prompted its use in the two pilot interviews conducted on 18th and 19th of November, 2010. The purpose was to test the interview design, identify weaknesses in format and make appropriate changes for the final version. Both interviews lasted about an hour and a half each. The participants were volunteers, a male and a female doing a degree in marketing at DIT Aungier Street and aged 29 and 23 respectively.

The pilot interviews differed from the final interviews in their approach towards administering the name interpreter questions. The semi structured technique offered a flexible way to collect some data about all alters yet use probing where necessary to expand on a topic of interest. Both interviews began with some basic questions about the participants to help them get talking and feel less apprehensive about the whole process. The interview guide broadly comprised three types of questions; those related to the attributes of the named alters (demographics, shared activities and relationship with ego), those related to assessing the tie strength (duration of relationship, frequency of communication and how close ego felt towards each alter) and those related to the drinking behaviour of the named alters (frequency and quantity of drinking and approval of drinking to get drunk). Information about each alter was sought in the same sequence as the participant had named them.

Two shortcomings were noted in following a semi structured approach. One, the monotony of responding to a similar line of questioning for all the people that one had named was tiresome and boring for the respondents and reduced their focus and interest as the interview progressed. Two, in efforts of collecting some information about all network members limited the opportunities of following threads that emerged during the conversation. In order to overcome these issues, the final interviews were unstructured thus allowing for a more flexible and conversational format.

5.6.5 The Main Interviews

The final chosen technique for the in depth interviews was the *unstructured interview* approach. Unstructured interviews are more flexible and casual than the aforementioned techniques. Minichiello and Helms (1997) define them as interviews in which neither the

question nor the answer categories are predetermined. Instead, such interviews rely on social interaction between the researcher and the informant. Punch and Punch (2005) describe unstructured interviews as a way to understand the complex behaviour of people without imposing any *a priori* categorization, which might limit the field of inquiry. That being said, such interviews are not completely non-directive and are generally guided by an *aide memoire* which provides direction on issues of interest.

In each interview, an opening statement encouraged the participants to talk about the people they named after the administration of the name generator questions. The opening statement said,

'Now that we have a list of names here, I want you to tell me about these people. You may start from anywhere you like and take your time. I'll listen first and try not to interrupt you. I might take some notes'.

Note taking was aided by a tabulated chronicle that recorded names of alters, key themes, situational contexts and specific phrases and expressions in the order mentioned by the participants as they spoke. This allowed the researcher to generate further questions, cues and probes in response to the interviewees' initial narration following the same order in which the participant spoke about the alters. After the initial narration, the interview took the form of a conversation focussing on developing an understanding of the interviewees' social surroundings from their perspective.

Though the researcher's control over the conversation was minimal, yet the conversation was guided by a 'path' or an *'aide memoire'* as is the case in most unstructured interviews (Corbetta, 2003; Punch and Punch, 2005). The path served as a tool to organize the items to be

investigated and keep track of interviewee narration (appendix 8). There were two main themes of interest; the nature of relationships ego shared with network members and the drinking behaviours of network members. Within these main themes the ‘path’ aimed at generating narratives related to several sub themes for example formation (*how did they get to know each other, common past experiences and common relationships*) and strength of the relationship (*duration known, frequency of communication, intimacy, common shared activities, meaning of important matters and exchange of support*), drinking behaviours and attitudes, their development and reinforcement and ways of socialization. The use of the *aide memoire* or the path encouraged a certain degree of consistency across different interviews.

Probing was used to elaborate on topics of interest which is not unusual in unstructured interviews. Researchers often probe, or ask for clarification during the course of unstructured interviews (Fontana and Frey, 2005), the purpose of which is to deepen the response to a question and to give cues to the interviewee about the level of response that is desired. Probing often took the form of repeating interviewees’ exact words and asking to explain what they meant by them or requesting concrete examples to aid understanding. For example, generally, perceptions of peer drinking came up in the initial narrative of the participants in some form and were further explored with the use of appropriate follow up cues and probes. In situations when they didn’t come up in the initial narrative, either direct probes were used such as ‘let’s talk about the drinking behaviour of the people you named’ or ‘you mentioned that X *loves her drink*, can you tell me more about it?’. Alternatively, gestures such as nodding or pausing a little longer than usual were used to encourage participants to continue with the description. Opinions and comparisons were sought (*such as, ‘what do you think about that?’ or ‘In what ways do you think that affected X?’*), clarifications and explanations of critical events and

social jargon were requested (*such as ‘can you explain what you mean when you say “wasted”?’*) and episodes and examples were encouraged (*such as, ‘can you think of an example to help me understand?’ or ‘can you describe an episode when you thought that happened?’*).

Care was taken to remain unobtrusive by avoiding leading questions and suggesting outcomes to minimize the interviewer’s influence on the participant. Methodological research emphasizes the importance of using neutral inputs because directive questions may bias the data by leading interviewees to respond in a way that they thought was expected or desired by the researcher (Corbetta, 2003; Punch and Punch, 2005).

The resulting data was rich and progressively constructed in what proved to be an interactive and empathetic process of dialogue.

5.6.5.1 Examining Interrelationships among Alters

Another important decision that needs to be made concerns whether ties between alters should be examined at all? Without information on the inter-relationships among alters, no structural analysis can be performed. Some studies related to social support choose to omit collecting data on network structure (House et al., 1985). However, from a network perspective, although burdensome, it is the structure of the network and how the structural properties affect behaviour that is informative (Hawe et al., 2004). In fact, there is evidence that the process of evaluating ties between network members is less burdensome than intuition might suggest (McCarty et al., 2007). McCarty and colleagues (2007) explain that when alter pairs are presented to respondents in a systematic way (such as one alter with all other alters, the next

with the rest and so on), respondents can get a feel for the way their alter lists are organized and anticipate their responses.

Based on the above discussion, the participants were requested to fill up an adjacency matrix; a very simple square matrix with as many rows and columns as the people in a network. The rows and columns in the network contain the names of the people (in the same sequence) as shown in the hypothetical example in Figure 5.

	Sam	Adam	Polly	Mary	Joe	Sally
Sam		1	1	1	0	0
Adam	1		1	1	0	0
Polly	1	1		1	0	0
Mary	1	1	1		0	0
Joe	0	0	0	0		1
Sally	0	0	0	0	1	

Figure 5: Example Adjacency Matrix

The scores in the cells of the matrix record information about the ties between each pair of alters with '1' indicating the presence of a tie and '0' indicating an absence. For example, in the matrix shown above, Sam knows Adam, Polly and Marry but does not know Joe and Sally. This kind of a matrix is the starting point for almost all network analysis, and is called an

"adjacency matrix" because it represents 'who knows whom' in the "social space" mapped by the relations that a researcher has measured.

Prior to filling out the matrix, the participants were informed that the objective of the exercise was to examine 'who knows whom' among the people that they named. Specifically, they were told to pick one name (e.g. Sam in this case) at a time from the top of the matrix, go down the corresponding row and identify the people Sam knows, meaning if Sam and Adam come across each other on a street and stop to say hello, they know each other. The participants were asked to repeat this process for all the people that they named. In consistency with past research (McCarty et al., 2007), it did not take long for the participants to complete the matrix. In fact most people were able to do it within 10 minutes.

5.6.5.2 Tie Strength

Another key consideration in network studies is the assessment of tie strength or the strength of relationships between the participants and their network members. Multiple measures have been used by researchers to obtain indices of tie strength (Marsden, 1990). Granovetter (1973) for example approaches the subject by defining the concept of tie strength in terms of its indicators which he describes are a combination of "the amount of time, the emotional intensity, the intimacy (mutual confiding) and the reciprocal services which characterize a tie" (p1361). Subsequent network research has utilized one or more of these indicators as the basis to create indices of the strength of a relationship. The most common approach is to assess the strength of a relationship based on indications of 'closeness', thus close friends are often regarded as 'strong ties' whereas acquaintances or friends of friends are said to be 'weak ties' (Erickson et al., 1978). A variation of this method is the presumption that the source of a

relationship dictates its strength; therefore, kinship ties are assumed to be strong whereas neighbours and co workers are treated as weaker ties (Murray et al., 1981). Other research interprets the strong ties as those which feature greater frequency of contact (Lin and Dumin, 1986), greater duration of contact and the exchange of emotional support and assistance within a relationship (Wellman, 1982).

Marsden and Campbell (1984) note in a study of best friend ties that measures of intensity of a relationship are the best indicators of the unobserved tie strength concept because these are not contaminated by other measures. The literature suggests that duration of the relationship tends to overstate the strength of kinship ties and frequency of contact exaggerates the strength of ties with co-workers and neighbours (Marsden, 1990). One innovation that has been adopted by several researchers studying ego networks is to make use of a concentric circle diagram as a measure to assess closeness (Curtis, 1979; Antonucci, 1986; Nadoh et al., 2004; Carrasco et al., 2008).

The same approach was adopted in this study. The technique began by asking the participants to look at a chart sized diagram of 6 concentric circles, with a smaller circle in the centre containing the word 'You'. Each circle was viewed as representing a different level of intimacy to the focal person such that the inner circles represented those who were closest to the ego and so on and so forth. The names of all alters were written on removable Post-It notes. The participants were then invited to position the tags on the diagram (reproduced below) based on how close they felt towards each network member.

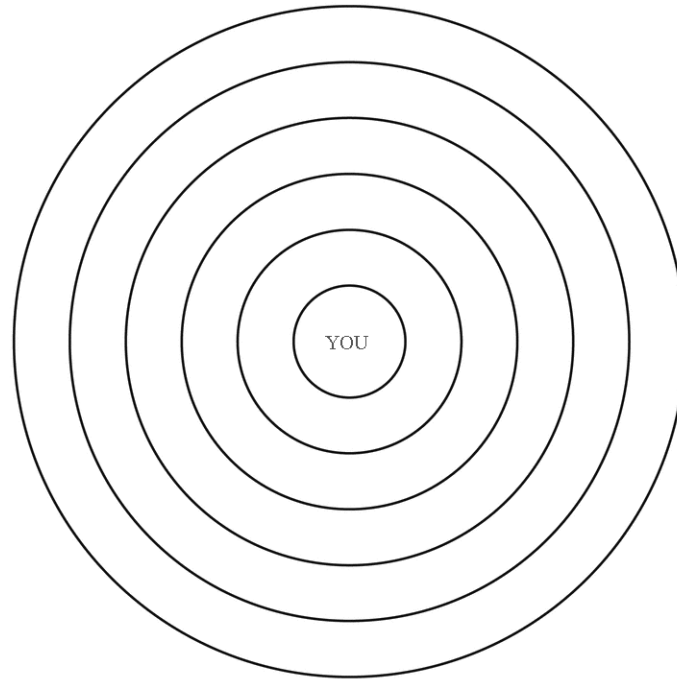


Figure 6: Concentric Circles Diagram

Chua and colleagues (2011) suggest that this technique induces respondents to think about their alters in relation to one another as well as to themselves and permits them to describe their networks according to their own personal feelings of intimacy.

Further, the activity saved time and was less burdensome to the participants compared to other measures such as rating the strength of each relationship on a predefined scale. It also provided the participants with an opportunity to view their networks which nearly all interviewees described as '*a fun thing to do*'.

5.7 Ethics of Research

Addressing ethical dilemmas and concerns is an indispensable element of conducting research. The present study was conducted in two stages using different methodologies thus resulting in data that was unique, requiring different and appropriate measures to ensure adherence to known ethical concerns. These included acquiring an informed consent from participants from both survey and interview participants, making participation voluntary, ensuring privacy and confidentiality of the collected data and dealing with issues relating to anonymity of the data (Marsden, 1990; Buchanan, 2002; Eysenbach and Wyatt, 2002).

5.7.1 Informed Consent

In keeping with ethical guidelines provided by researchers (Eysenbach and Wyatt, 2002; Mathy et al., 2003; Corden et al., 2005; Buchanan and Hvizdak, 2009), both the web survey and in depth interviews were preceded with a full disclosure about the ramifications of the study such as the purpose of research, the privacy/confidentiality assurance, the methods being used and possible outcomes so that the participants may make an informed judgment about their participation. Contact details of the researcher were also provided for any clarifications or queries that respondents might have wanted to discuss. Further, participation in the survey and interviews was made voluntary and the participants were informed that they were free to withdraw from the study at any stage.

5.7.2 Privacy and Confidentiality

The principles of research ethics dictate that researchers must ensure adequate provision of measures to protect the privacy of respondents and to maintain the confidentiality of data. A

violation of privacy or breach of confidentiality can present the danger of exposing personal or sensitive information (Buchanan and Hvizdak, 2009).

The protection of privacy and confidentiality was addressed through a combination of research tactics and practices as is recommended by researchers (Mathy et al., 2003) for both stages of this research. Only students 18 years of age and above were recruited in the study. The participants were assured that their information will not be used or disclosed for purposes other than academic research and that the data will be retained only for the duration of the current project. Once collected, the survey data was imported in SPSS in a password protected personal computer of the researcher. The data was also removed in entirety from the web survey hosts employed in this research and the respective online accounts were deleted. Audio recordings from the interviews were destroyed after being transcribed to a textual form for the analysis. All textual and graphical data from the interviews such as the interviewer's side notes, adjacency matrices, concentric circle diagrams and alter attribute charts were converted to a digital form and stored in the researcher's password protected personal computer for the duration of this study.

5.7.3 Anonymity

A related concern was the non anonymous nature of the data collected. As commented in section 5.9.1, in order to cross check multiple submissions and prevent data contamination by irrelevant subjects, the provision of a DIT student ID number was made mandatory for the survey response to be submitted. Further, the sample for stage 2 was drawn from the web survey respondents which necessitated a means to be able to contact them later on in the study. This information was also needed to be able to contact the winner of the draw for the incentive.

Students were thus asked to provide their email addresses in the web survey. The survey data was subjected to statistical techniques of analysis where the focus is interpreting and reporting the results at an aggregate level. Anonymity is therefore not easily compromised. The issue however becomes more serious in network studies where asking for names of significant others, requesting information on interrelationships of these people and asking to share personal experiences related to those named is commonplace. Non participants are still included in a sense that they are mentioned and discussed by others. Network studies therefore differ from typical social science research because they reveal details of a person's social surroundings (in the form of a network diagram and narratives) rather than reducing the data to summary statistics. In order to protect the interests of the participants and preserve the viability of their own academic field, network analysts propose a basic set of ethical guidelines (Borgatti and Molina, 2003a) which recommend protecting identifiable information and participant identity by means of processes designed to anonymize them. In keeping with this research (Borgatti and Molina, 2003b), pseudo names and codes were used to refer to the participants and their network members respectively to protect their identity. Further, any information that could be traced back to them was anonymized prior to inclusion in this thesis.

5.7.4 DIT Ethics Committee Approval

The methods adopted in both stages of this research were reviewed and approved by the DIT Research Ethics Committee. The unique ethical clearance reference number for this study as issued by the committee was provided to the participants along with relevant contact details for reporting any breaches to confidentiality and privacy of the information they provided.

5.8 Data Transformation and Analysis

Survey data from wave 1 was subsequently imported in SPSS for a comprehensive descriptive analysis and hierarchical multiple regression procedure to address the research objectives 1, 2 and 3. This analysis helped in determining the normative drinking rates prevalent at DIT. These were then compared with perceived peer drinking norms to establish if misperceptions existed as has been shown to be the case in other cultures (Perkins and Craig, 2002; McAlaney and McMahan, 2007; Perkins, 2007). The regression procedure investigated the influence of these perceived norms in predicting personal consumption. It also assisted in determining the relative impact of descriptive and injunctive norms on drinking behaviour.

The data generated from the in depth interviews, comprised network data and qualitative data. This data was analyzed by mixing formal measures of SNA with content analysis of the interviews and interpreting the results combining the information from both methods. The network data (such as the network members, their attributes and their ties with other members) was input into UCINET (Borgatti et al., 2002) for the application of standard network techniques. The qualitative data from the interviews was subjected to content analysis which is a systematic coding and categorizing approach used for exploring large amounts of textual information unobtrusively to determine trends and patterns of themes, their frequency and their relationships (Vaismoradi et al., 2013). The interviews were transcribed, creating a verbatim text of every interview by typing out each question and its response using the audio recordings. A sense of the data was obtained by reading the transcripts several times. Open coding, which refers to categorizing the data into segments and scrutinizing it for commonalities and disparities (Pope et al., 2006) was then used to identify and isolate meaningful patterns and

processes across the data. The data analysis process was not linear but recursive which involved frequent reviews. The aforementioned procedure provided descriptions of the composition and structure of the networks such as size, effective size, generation of specific structural typologies, evaluations of tie strength and subjective meanings associated with these feelings. This elaborate set of descriptions helped in the identification of the most salient and possibly influential people in the ego networks of the participants addressing objective 4.

Data from the two data collection methods (web survey and interviews) was linked to evaluate the possibility of normative perceptions and personal consumption been shaped and influenced by one's personal network. This was aimed to address research objective 5. Further, this analysis helped in examining the development, sustainment and dissemination of drinking norms in the networks. Finally, the outcomes of the two data collection methods were linked to demonstrate how the methods complemented each other and added value to the study.

5.9 Limitations of Methodological Approach

5.9.1 Specific Issues Related to the Web Survey

Sampling

The sample for the web survey was not randomly drawn as is generally the case with internet based surveys. Indeed, most web surveys involving college students are conducted using non probability sampling methods such as convenience sampling or purposive sampling (Couper, 2000). While strictly speaking statistical tests require probability sampling, in practice web surveys are commonly analysed using such tests. McAlaney (2007) and McAlaney and

McMahon (2007) are examples of SN studies conducted in the UK which have used web surveys in college populations and analyzed the resulting data using statistical methods. Therefore whilst it is acknowledged that the online data collection method utilized in this study may have implications of representativeness of the sample to the student population because of non probability sampling, the benefits in terms of quickly and largely accessing a population dispersed across five campuses outweighed the costs.

Self Reports

Surveys related to drinking behaviours generally rely on self reports of personal consumption, the validity of which is often questioned by substance use researchers (Midanik, 1988). Although several studies suggest that memory aids can be used to enhance the recall of drinking, (Midanik, 1988; Sobell and Sobell, 1992; Hammersley, 1994; Single and Wortley, 1994), it is important to remember that almost all drinking measures are retrospective and, as such, they require people to provide the “best estimate” of their past drinking. Further, there is a reasonable amount of evidence that describes self recall of drinking as a reasonably accurate method to capture personal consumption without making huge compromises on the reliability and validity of the results (Johnston, 2001; Brener et al., 2003; Lintonen et al., 2004). Studies also support the reliability and validity of self reports in online surveys for health risk behaviours (Ramo et al., 2011) and reflect that issues of reliability/validity are often specific to measures being used rather than the online survey methodology.

Control over the Sample

The issue of self reports is even more important in online surveys because researchers cannot be physically present at the time the participants take the survey and subsequently lose control

over the makeup of sample. The ease of forwarding web addresses can make it difficult to verify that the individuals who replied to the survey actually belong to the target population. The anonymity of internet also makes it easier to submit multiple responses to online surveys by the same person which increases the likelihood to respond mendaciously. It therefore cannot be ruled out that self reporting can be a source of bias in this study. Several of these concerns were addressed by the use of authentication measures during the web survey and screening the data prior to analysis.

First, the survey invites were sent via the Public Affairs Office and the Campus Life Office at DIT using the internal student email system which is used on daily basis by the students as has been discussed in section 5.5.4. This measure whilst not completely eliminated the possibility of non-students responding, was certainly a more secure method of sending invites than posting the survey link on public forums like Facebook or Friendster. Second, supplying student numbers and valid DIT email addresses was made compulsory for the survey to be submitted and entered into the draw for an incentive. This prevented outsiders from taking the survey and multiple submissions from the same individual.

Causality

The cross sectional nature of this study limits its internal validity. As such, causal inferences cannot be made with certainty. This is an inherent limitation of cross sectional research and is applicable to both phases of this study. However, the causal assumptions made in this study are based on theory and past longitudinal research (Fearnow-Kenny et al., 2001). Further, the combination of quantitative and qualitative research methods employed in this study provide strength to the findings (More on this in chapter 8, section 8.2).

Representativeness and Generalization

It has been noted in the US that internet users in the general public differ from non-users on several demographic, social and psychological factors (Robinson et al., 2002). This means that public samples obtained via the internet can be questioned in terms of how representative they are of the larger population. This is a particularly important issue given the low response rate associated with online surveys. While it is essential to acknowledge these concerns related to data collection via online methods, the design of this study negates most of these concerns. First, the sample in this study was drawn from the registered students at DIT and it can be argued that these students will not differ greatly in terms of their demographic and social psychological characteristics. Second, several researchers argue that response rates obtained via online survey methods are not significantly different than would be obtained from traditional postal surveys (Morphew and Williams, 1998). Third, previous studies note that the difference between responders and non responders to online surveys tend to be minimal when a population is clearly identified and comprises regular computer users (Kraut et al., 2004; Hayslett and Wildemuth, 2005). The web survey was disseminated via the college email system and the website of the Campus Life Office. Unlike public surveys, it can be reasoned with confidence that DIT students are regular users of these channels thus minimizing errors related to the coverage of population. Finally, as has been discussed in section 5.5.7, the sample for the web survey was found to be representative of the population with regards to gender and age and no significant differences were found between early and late respondents.

5.9.2 Specific Issues Related to Ego Network Analysis and In-depth Interviews

Generalization

The sample for the in depth interviews was not statistically representative of the population as is generally the case with qualitative methods of data collection. The purpose of utilizing SNA in combination with in depth interviews in the present study was to discover the meaning and understanding of norm salience rather than to verify or predict outcomes. Some qualitative experts argue that qualitative findings can be generalized to other people, settings, times and treatments to the degree to which they are similar to the people, settings, times and treatments in the original study (Johnson and Christensen, 2007). Stake (1978) uses the term '*naturalistic generalization*' to refer to this process of generalizing qualitative explanations on the basis of similarity. Whilst it is accepted that the network results and related qualitative interpretations uncovered in this study may not be generalized to the population in traditional sense of the word, it is possible that the study may have uncovered a phenomenon which is particularly related to commuter colleges (More on this in chapter 9, section 9.5). Therefore, the findings may be tentatively and naturalistically generalized to the extent of being especially relevant to commuter colleges.

Self Reported Network Data

One of the inherent features of ego network analysis relates to the process of determining network structure. Unlike whole networks, which are based on a near-complete enumeration of the population of interest and collect data from every member of the network, ego networks view social environments from the eyes of the focal individual (ego). Egocentric network data is therefore based purely upon the knowledge, reflection and recall of the ego (O'Malley et al., 2012). It captures the diversity in the social environment of individuals and it is because of this diversity that the boundaries of ego networks are dependent on the context being examined and

generally not known at the onset of an inquiry. Since it is not possible to collect network data from each and every member of an ego network, egos (participants) report on the presence or absence of ties between each pair of nodes in their networks. The possibility that participants might not have been aware of all possible ties in their networks or might not have recalled them fully is thus inevitable. Network analysts believe that examining ego networks is still relevant and useful considering that an ego's *perception* of relationships may be more important than whether or not the perceived relationship is validated via reciprocation by the alter (O'Malley et al., 2012).

Missing Data

Social network studies are especially sensitive to missing data which often occurs due to non response. It can either take the form of a participant leaving out a relevant node altogether referred to as *unit non-response* or not completing specific items related to a node(s) referred to as *item non-response*. Researchers caution that this can have negative effects on the structural properties of networks (Burt, 1987; Ghani et al., 1998; Borgatti and Molina, 2003b; Kossinets, 2006). The problems associated with sampling and missing data in whole network studies often stem from the inability of researchers to interview or observe network members. For ego networks, alters and ties are often missing because respondents either did not recall them or were not asked about them in such a way so as to fully capture the network structure.

Several steps were taken to minimize the occurrence of missing data in this study. First, free recall method was used to extract ego networks which is argued to be the most comprehensive though time consuming method of eliciting network members (Ferligoj and Hlebec, 1999; Carrasco et al., 2008). Second, multiple name generators were administered to ensure inclusion

of all relevant nodes. In addition, a third name generator was administered probing if there was anyone else that the participant might have missed in the first two questions and would want to mention. Third, item non response was addressed by reviewing the alter attribute chart, the concentric circles evaluation and the adjacency matrix prior to the termination of each interview and complete any missing information. This step ensured that there was no missing data with regards to alter attributes, tie strength scores and interrelationships of alters. Finally, the understanding of the functionality of ego networks and the formation, dissemination and reinforcement of drinking norms within them was based on a qualitative interpretation of the interviews which strengthened the analysis and further reduced the chances of omitting socially relevant and salient nodes.

Researcher Bias

As with any qualitative inquiry, researcher bias might have occurred and therefore it is acknowledged. Researcher bias is an important concern in qualitative research because this type of research tends to be exploratory, open ended and less structured than quantitative methods (Johnson and Christensen, 2007). It may occur in the form of selective observation, selective recording of information and also from allowing one's personal opinions and perspectives to affect how qualitative data is interpreted and how the research is conducted. While it is not possible to completely eliminate researcher bias from any qualitative study (Johnson and Christensen, 2007), efforts were made to reduce its impact by improving the rigor of data collection in keeping with research on qualitative methods (Johnson and Christensen, 2007). This was achieved through the use of neutral probing, fewer assumptions and avoidance of leading questions and/or premature interpretation. In addition, the use of low

inference descriptors was maximized in deriving qualitative explanations and reporting them. This was achieved by phrasing descriptions very close to the participants' accounts and researcher's interview notes and using direct quotations where appropriate to expand on the findings.

6 Analysis and Results of Survey Data

This chapter presents the results of analysis performed on the survey data and serves the overarching aim of addressing objectives one, two and three of this research as outlined in chapter 5, section 5.2. It begins with developing a feel about the data and presenting the key descriptive findings which establish an understanding of alcohol consumption levels across DIT. Self reported personal consumption is then compared with perceived peer norms to assess if students misperceived these norms as has been found in prior studies described in chapter 3, section 3.6.2. The results of hierarchical multiple regressions follow. These results address two important aspects of this study. First, the effect of perceived peer norms of different referent groups on personal consumption is investigated. Second, the relative impact of perceived descriptive and injunctive norms on personal consumption is examined. The chapter concludes with a short discussion of key findings.

6.1 Data Cleaning

A total of 2115 completed electronic surveys were retrieved from surveygizmo.com. This data was first screened for missing values. Three cases of system missing values were removed. Next, the ethnicity of respondents was examined. 14% of the sample comprised international students. Since the study was designed for and aimed at Irish students only, these were removed from the dataset. It was also felt necessary to limit the maximum age in the sample as this study was aimed at studying drinking habits and normative mechanisms prevalent among undergraduate students at DIT. Finally, only full time under graduate students were retained in the sample. The effective sample size was N=1700.

6.2 Descriptive Statistics

57% of the sample was male while 43% was female. Mean age of the sample was 21.13 years. 68% of the students lived with parents, 24% in shared accommodations, 5% with their partners or dependent others and only 3% lived alone. 50% of the students reported being in DIT 1 year or less, 16% reported 2 years, 18% reported 3 years, 12% reported 4 years and 4% reported 5 or more years.

Variable	Mean	Std. Deviation
Age	21.13	2.884
Year in college	1.70	1.596
Money available for drinking	46.94	34.516
Age of first drink	14.68	2.683
Drinking group size	2.08	20.776

Table 5: Standard descriptive Statistics

The sample distribution across various campuses is presented below.

% Sample Distribution Across DIT Campuses	
DIT Mountjoy Square	7
DIT Cathal Brugha Street	16
DIT Bolton Street	23
DIT Aungier Street	32
DIT Kevin Street	20
DIT Rathmines Road	2
<i>Total</i>	<i>100</i>

Table 6: Sample distribution across campuses in percentage

94% of those surveyed had been involved in underage drinking at some stage reporting that they had their first proper drink before they turned 18. The mean age at which students reported having consumed their first drink of alcohol (other than just a sip) was a little shy of

15 years. 60% of the sample reported having anywhere between € 20 and € 80 available in a week for drinking. The average amount of money available for drinking in a week was around € 47.

6.2.1 Personal Alcohol Consumption

Personal consumption of alcohol was measured along three dimensions (1) frequency of drinking in a typical month, (2) number of drinks on a typical drinking occasion and (3) frequency of drunkenness in a typical month as described in chapter 5, section 5.5.6.2. The percentage distribution across these dimensions is presented below.

Frequency of drinking in a typical month		
	%	Cumulative %
Never	4	4
Less than once a month	4	8
once a month	5	13
2-3 days a month	22	35
Once a week	32	67
Twice a week	26	93
3-4 days a week	6	99
5-6 days a week	1	100

No. of drinks on a typical occasion		
	%	Cumulative %
0	4	4
1-2	3	7
3-4	10	17
5-6	18	35
7-8	19	54
9-10	15	69
11-12	10	79
13-14	8	87
15 or more	13	100

Frequency of drunkenness in a typical month		
	%	Cumulative %
Never	10	10
Less than once a month	11	21
once a month	12	33
2-3 days a month	25	58
Once a week	28	86
Twice a week	12	98
3-4 days a week	2	100

Table 7: Personal alcohol consumption

As can be seen from Table 7, 64% respondents reported drinking once a week or more frequently in a typical month. Only 4% reported that they never drank alcohol. 83% people reported drinking 5 drinks or more on a typical drinking occasion, 13% reported 3-4 drinks or less and only 4% reported 0 drinks. 42% of those surveyed reported drinking enough alcohol to get drunk once a week or more frequently in a typical month, 25% reported 2-3 days a month, 23% reported once a month or less and 10% reported never drinking enough alcohol to get drunk. The mean number of drinks consumed on a typical occasion for females was 6.63 compared to 10.27 for males.

6.2.2 Descriptive Norms (DN) Vs. Personal Consumption

The means and standard deviations of personal consumption and perceived descriptive norms in 5 referent groups are presented next.

	Frequency of drinking in a typical month (Days)		No. of drinks on a typical occasion		Frequency of drunkenness in a typical month (Days)	
	<i>Mean</i>	<i>St dev</i>	<i>Mean</i>	<i>St dev</i>	<i>Mean</i>	<i>St dev</i>
Personal alcohol use	4.91	3.67	8.68	4.63	3.26	3.05
Most students at DIT	8.51	3.87	9.74	3.79	6.14	3.44
Close friends	7.23	3.98	9.59	4.22	5.02	3.39
Best friend	6.55	4.52	9.03	4.58	4.52	3.75
Mother	5.17	6.46	3.02	2.64	1.11	3.2
Father	7.05	7.6	4.98	4.08	1.95	4.37

Table 8: Means and St Deviations of personal consumption vs. the perceived descriptive norm

Four important findings can be deduced from Table 8. First, most students overestimated the prevalence of drinking in DIT along all three dimensions of alcohol consumption used in this study. Second, students also perceived their proximal peers (close friends and best friend) to

consume greater quantities of alcohol more often and to drink enough alcohol to get drunk more frequently than they themselves. Third, most students perceived distal peers (most students at DIT) to have more permissive drinking than that of proximal peers (close friends, best friend) across all three dimensions of alcohol use. Fourth, most people perceived their fathers to have a more permissive drinking behaviour as compared to their mothers along all three dimensions of alcohol use. These trends were found to be consistent for both males and females and across all campuses of DIT.

In addition, it was noticed that abstainers also overestimated the campus norm drinking and that they also perceived their proximal peers to drink more than themselves. The following table illustrates this.

<i>Values by cohort: Abstainers</i>	Frequency of drinking in a typical month (Days)	No. of drinks on a typical occa- sion	Frequency of drunkenness in a typical month (Days)
	<i>Mean</i>	<i>Mean</i>	<i>Mean</i>
Most students at DIT	8.88	9.00	4.84
Close friends	6.96	6.77	3.08
Best friend	5.06	5.23	2.22
Mother	3.76	0.99	0.26
Father	5.2	3.11	0.79

Table 9: Means of perceived descriptive norm for abstainers

Further, as expected students reported consuming comparatively less alcohol when they had college the next day (Mean: 6.3 drinks).

Figure 7, Figure 8 and Figure 9 provide a graphical illustration of personal consumption behaviours and perceptions of these behaviours in distal and proximal referent groups.

The graphs illustrate that self reported personal consumption of the respondents was less than the perceptions of the behaviour in other social groups who were used as reference. Also, most students perceived their close friends and best friend to have less permissive attitudes towards drinking than most students in DIT. For example, while 4% students reported that they never drink alcohol or do so less than once a month; hardly any thought that other students in DIT drink that infrequently. Similarly, while 22% students reported drinking 2-3 days a month, less than 5% thought that other students did the same. However, 7% and 13% thought that their close friends and best friend respectively drank 2-3 times a month. On the other hand, while 33% reported drinking twice a week or more, almost 80% thought that others in DIT did the same and almost 60% and 50% respectively thought that their close friends and best friend did the same.

Similar patterns were observed for the number of drinks on a typical occasion and the frequency of drunkenness in a typical month. For example while 46% students reported drinking 9-10 drinks on an occasion or more, 60%, 54% and 48% respectively thought that most students in DIT, their close friends and best friend did the same. Likewise, while 42% reported drinking enough alcohol to get drunk once a week or more frequently, twice (84%) as many thought that most students in DIT did the same while the percentages for perceptions of close friends' and best friend's behaviour were comparatively less (68% and 60% respectively).

80% of those surveyed, overestimated the norm for frequency of drinking in a typical month, 60% overestimated the norm for the number of drinks on a typical drinking occasion and 85% overestimated the norm for frequency of drunkenness in a typical month.

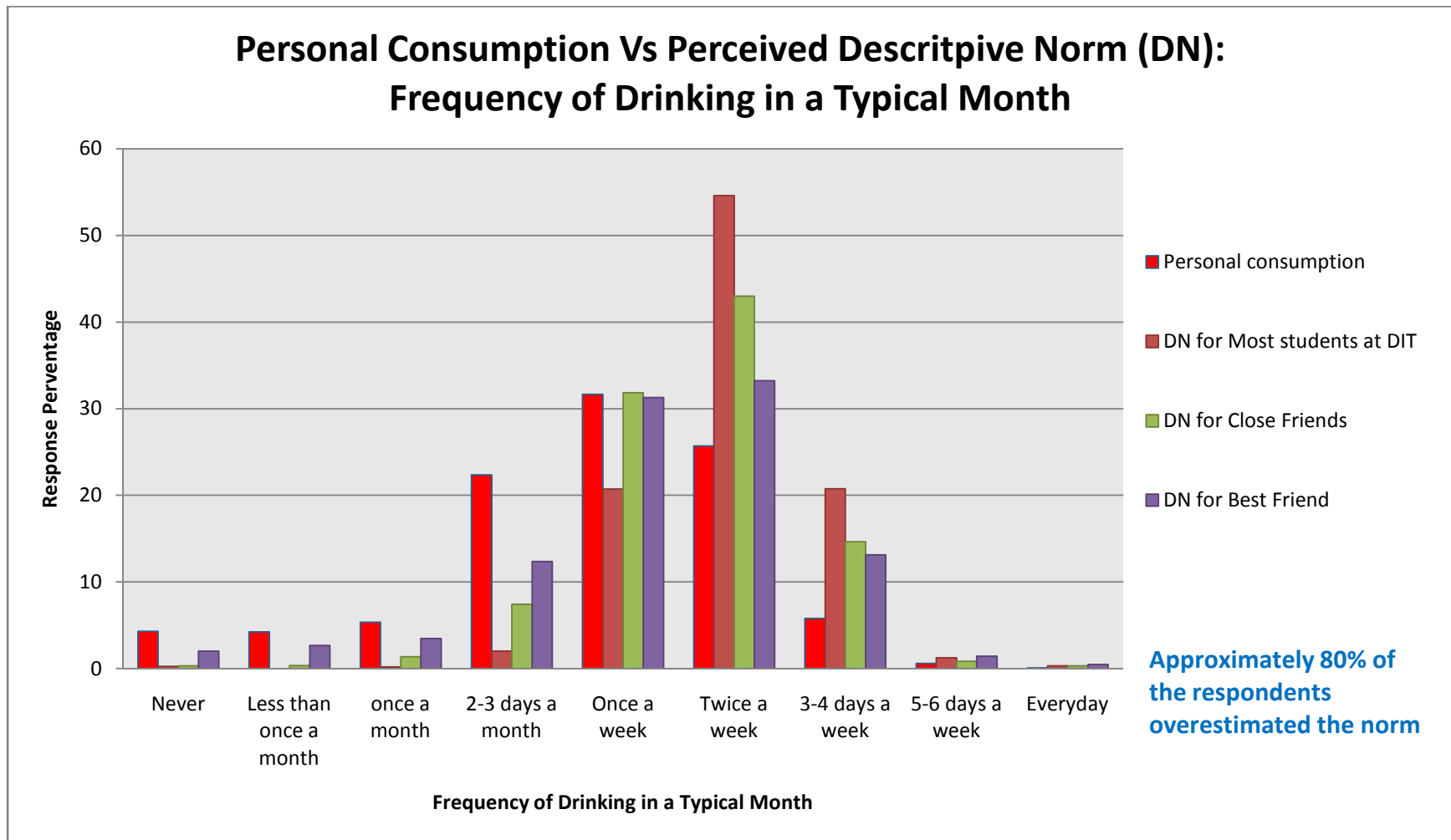


Figure 7: Frequency of drinking in a typical month Vs the perceived norm

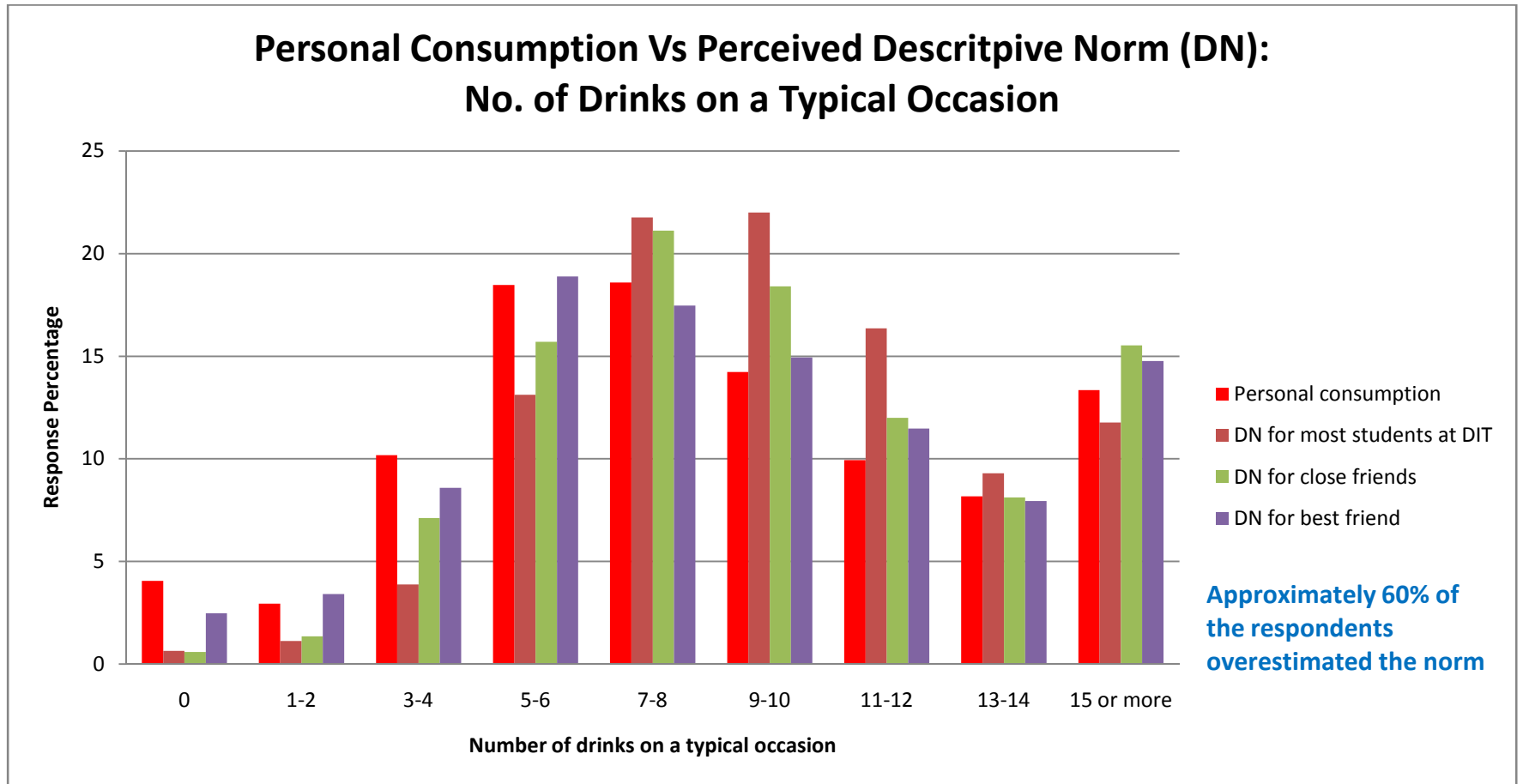


Figure 8: No. of drinks on a typical occasion Vs the perceived norm

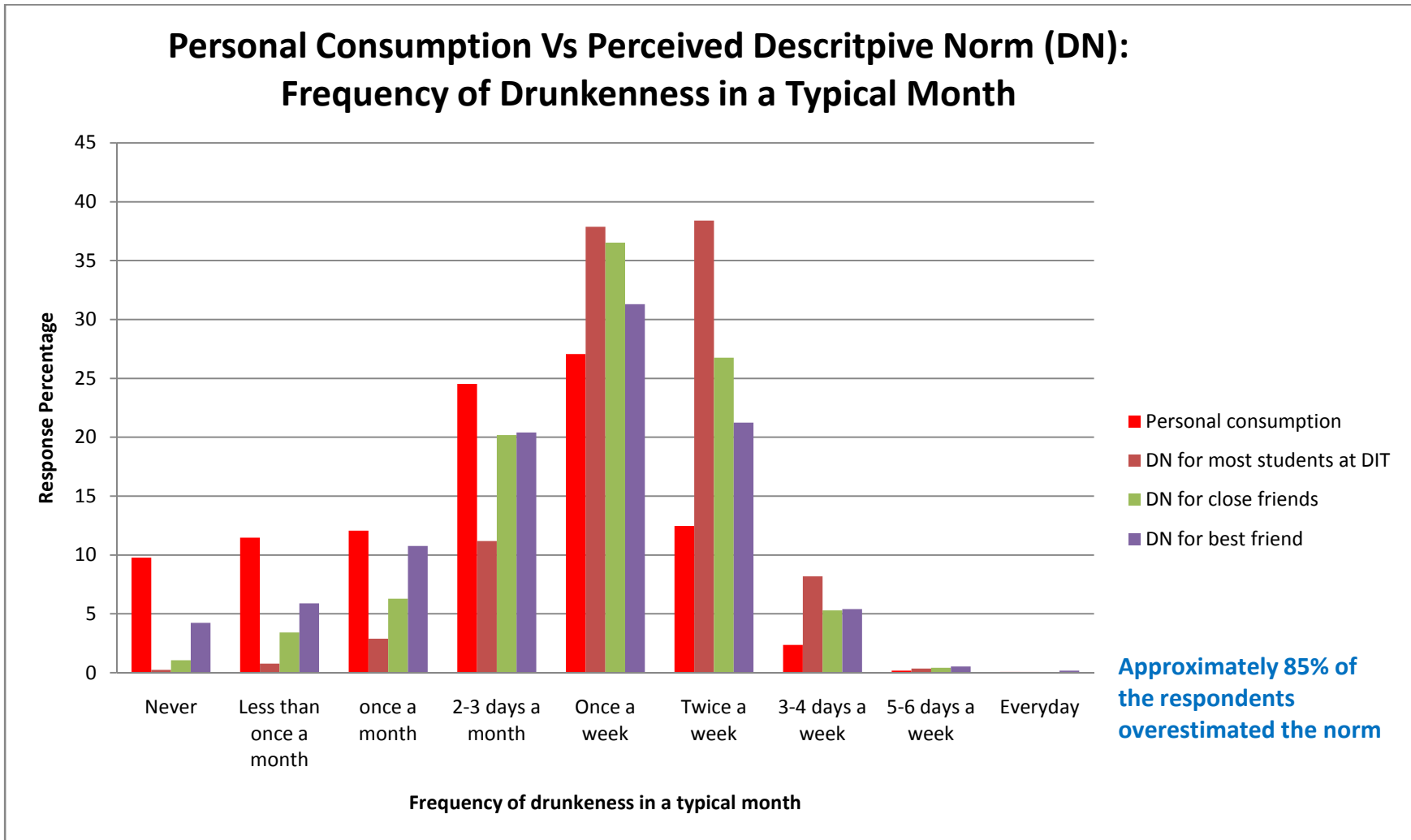


Figure 9: Frequency of drunkenness in a typical month Vs the perceived norm

6.2.3 Injunctive Norms vs. Personal Consumption

Injunctive norms were conceptualized as the perceived approval for drinking to get drunk as has been described in chapter 5, section 5.5.6.4. Most students perceived both distal and proximal peers to have approving attitudes towards drinking to get drunk. Specifically, 76% of the sample thought that for most students in DIT, drinking to get drunk was acceptable. Only 7% disagreed with the statement. 70% of the sample thought that their close friends would approve if they drank to get drunk. Only 10% disagreed with the statement. 68% students thought that their best friend would approve if they drank to get drunk. Only 15% disagreed with the statement. Parents were an exception with most students perceiving their parents to be less approving if they drank to get drunk. 45% and 38% of those surveyed respectively thought that it was unacceptable to their mother and father if they drank to get drunk. Only 12% and 14% students respectively thought otherwise.

6.3 Correlations

In order to examine the association between personal consumption and perceived norms, Pearson's correlations were carried out. The procedure was repeated for all three dimensions of alcohol use and for all reference groups included in this study. These calculations were performed twice, once with the abstainers included and once with them excluded. Given similar results, the outcome from the analysis with abstainers included is presented here.

Alcohol Consumption Measure	Referent Groups				
	Most stu- dents at DIT	Close Friends	Best Friend	Mother	Father
	<i>DIT Aungier Street (n=545)</i>				
Frequency of drinking in a typical month	0.24**	0.57**	0.56**	0.10**	0.15**
No. of drinks on a typical occasion	0.66**	0.84**	0.79**	0.29**	0.38**
Frequency of drunkenness in a typical month	0.39**	0.63**	0.52**	0.09**	0.15**
	<i>DIT Bolton Street (n=393)</i>				
Frequency of drinking in a typical month	0.20**	0.55**	0.45**	no corr	no corr
No. of drinks on a typical occasion	0.64**	0.80**	0.76**	0.22**	0.28**
Frequency of drunkenness in a typical month	0.42**	0.60**	0.46**	0.12*	0.16**
	<i>DIT Kevin Street (n=347)</i>				
Frequency of drinking in a typical month	0.16**	0.37**	0.45**	0.11**	no corr
No. of drinks on a typical occasion	0.51**	0.72**	0.72**	0.27**	0.32**
Frequency of drunkenness in a typical month	0.40**	0.59**	0.57**	no corr	no corr
	<i>DIT Mountjoy Square (n=121)</i>				
Frequency of drinking in a typical month	0.28**	0.57**	0.53**	no corr	0.22*
No. of drinks on a typical occasion	0.57**	0.70**	0.67**	no corr	0.21**
Frequency of drunkenness in a typical month	0.55**	0.59**	0.64**	0.57**	0.49**
	<i>DIT Cathal Brugha Street (n=266)</i>				
Frequency of drinking in a typical month	0.21**	0.5**	0.49**	0.17**	0.15*
No. of drinks on a typical occasion	0.62**	0.76**	0.72**	0.25**	0.27**
Frequency of drunkenness in a typical month	0.40**	0.44**	0.44**	no corr	no corr
	TOTAL SAMPLE (N=1700)				
Frequency of drinking in a typical month	0.22**	0.49**	0.47**	0.11**	0.13**
No. of drinks on a typical occasion	0.62**	0.80**	0.85**	0.25**	0.30**
Frequency of drunkenness in a typical month	0.43**	0.62**	0.69**	0.06**	0.10**

Table 10: Pearson's correlation between personal consumption and perceived descriptive norms (* $p < 0.05$, ** $p < 0.01$)

The correlation results indicated an overall positive relationship between individuals' own drinking behaviour and their perceptions of alcohol consumption in others. This is in agreement with previous research regarding descriptive norms (McAlaney and McMahon, 2007). It was also noticeable that the order of strength of these correlations agreed with previous normative research (McAlaney and McMahon, 2007) in that the perceptions of alcohol usage of closer peers was more strongly associated with personal consumption compared to distal peers (most students at DIT). Of all referent groups, perceived descriptive norms for parents were the least associated with one's personal consumption. This suggests that peers may be a more relevant source of normative information as opposed to parents as is also noted by Borsari and Carey (2001, 2003). Further, it is interesting to note that the association between personal consumption and perceived descriptive norms was stronger for certain dimensions of alcohol consumption with the number of drinks consumed on a typical occasion being the most strongly associated. This suggests that normative beliefs may have a stronger influence on some dimensions of alcohol usage than others. McAlaney (2007) notices a similar pattern. These results were consistent for both males and females and across all campuses of DIT. This set of correlations was not performed for DIT Rathmines Road campus because the number of respondents from this campus (n=28) were few.

The third research objective of this study, related to investigating the relative impact of descriptive and injunctive norms on drinking behaviour. Pearson's correlation was performed between personal consumption and perceived injunctive norms for each referent group in order to investigate the association between the two. The results are presented in Table 11.

Alcohol Consumption Measure	Referent Groups				
	Most students at DIT	Close Friends	Best Friend	Mother	Father
<i>DIT Aungier Street (n=545)</i>					
Frequency of drinking in a typical month	no corr	0.19**	0.21**	0.11**	0.11**
No. of drinks on a typical occasion	0.19**	0.40**	0.34**	0.12**	0.17**
Frequency of drunkenness in a typical month	0.16**	0.32**	0.33**	0.13**	0.11**
<i>DIT Bolton Street (n=393)</i>					
Frequency of drinking in a typical month	0.10*	0.30**	0.25**	no corr	0.10*
No. of drinks on a typical occasion	0.14**	0.37**	0.38**	0.112*	0.22**
Frequency of drunkenness in a typical month	0.22**	0.35**	0.34**	0.122*	0.17**
<i>DIT Kevin Street (n=347)</i>					
Frequency of drinking in a typical month	no corr	0.13**	0.17**	no corr	no corr
No. of drinks on a typical occasion	0.13**	0.31**	0.31**	0.13**	no corr
Frequency of drunkenness in a typical month	0.18**	0.29**	0.27**	no corr	no corr
<i>DIT Mountjoy Square (n=121)</i>					
Frequency of drinking in a typical month	no corr	0.21*	0.18*	no corr	0.27**
No. of drinks on a typical occasion	no corr	0.30**	0.30**	no corr	no corr
Frequency of drunkenness in a typical month	no corr	0.21*	0.23**	no corr	no corr
<i>DIT Cathal Brugha Street (n=266)</i>					
Frequency of drinking in a typical month	no corr	0.21**	0.22**	0.24**	0.24**
No. of drinks on a typical occasion	0.19**	0.22**	0.27**	0.27**	0.23**
Frequency of drunkenness in a typical month	no corr	0.32**	0.32**	no corr	no corr
TOTAL SAMPLE (N=1700)					
Frequency of drinking in a typical month	0.08**	0.21**	0.29**	0.10**	0.11**
No. of drinks on a typical occasion	0.16**	0.32**	0.39**	0.14**	0.17**
Frequency of drunkenness in a typical month	0.20**	0.37**	0.40**	0.15**	0.13**

Table 11: Pearson's correlation between personal consumption and perceived injunctive norms (* $p < 0.05$, ** $p < 0.01$)

The results reveal an overall weak but positive significant relationship between injunctive norms and personal consumption. Similar to the previous set of correlations presented in Table 10, the order of strength of these correlations agree with existing research in that the perceptions of injunctive norm for proximal peers were more strongly associated with personal consumption compared to those of distal peers (most students at DIT). This pattern is consistent across all campuses of DIT. For some peer groups (most students at DIT and parents) no correlations were found during examination of campus wise data. This also suggests that the relationship was not as strong when the dataset was examined in groups.

The results discussed above also seem to be in agreement with research which reports the perceptions of descriptive norms to be more strongly related to personal consumption than those of injunctive norms (McAlaney, 2007). These results were consistent for all three dimensions of personal consumption and across all referent groups. The only exceptions were parents. In this case, the Pearson's correlation coefficient values were comparable for both descriptive and injunctive norms reflecting a weaker association between perceptions and personal consumption. This may be because of the relatively less relevance of parents compared to peers when it comes to alcohol consumption in a collegiate context as commented earlier in this section.

6.4 Hierarchical Multiple Regression

Hierarchical multiple regression was used to investigate the predictive relationship between perceived norms and personal consumption. The three measures of alcohol consumption were treated as dependent variables. There were several predictor variables. The three dependent

variables were: (1) frequency of drinking in a typical month (2) the number of drinks consumed on a typical drinking occasion and (3) frequency of drunkenness in a typical month. Therefore, three sets of hierarchical multiple regressions were carried out, one for each dependent variable in the study.

6.4.1 Data set considerations

Before conducting the hierarchical multiple regression procedure on each dependent variable, the data set was subjected to the following considerations.

- 1) For the analysis of each dependent variable, the abstainers were excluded from the dataset. This was felt necessary because the study focussed on examining the drinking behaviour of college students which makes sense only if drinkers are considered. Also, abstainers choose to not drink while being surrounded by students who do drink. This suggests that the thoughts and motivations that drive the attitudes and behaviour of abstainers might differ from those of drinkers, which is interesting to investigate but beyond the scope of this study. Abstainers were conceptualized as those who responded as 'never' and '0' to the measures of frequency of drinking and drunkenness in a typical month and number of drinks consumed on a typical occasion respectively.
- 2) In order to improve the skew and kurtosis of the underlying distributions and bring them closer to the normal curve, the few cases with very high values were treated as outliers and were not included in the regression analysis. However, before removing these cases, the resulting implications on regression outcomes were considered by examining the R^2 values and the predictive power of the independent variables. Given the same pattern of

results regardless of whether these cases were included or not, it was decided to exclude them.

6.4.2 Assumption Testing

Once an appropriate model for hierarchical multiple regression was achieved for each dependent variable, a detailed analysis was carried out to ensure that the basic assumptions of regression were not being violated. Specifically the following assumptions were tested for each set of regressions.

1. Assumption of collinearity
2. Assumption of linearity
3. Assumption of homoscedasticity
4. Assumption of non stochastic x
5. Assumption of zero mean of the error term
6. Assumption of normality

The details of this procedure along with relevant statistical inferences and plots are provided in appendix 7.

6.4.3 First set of regressions

Dependent variable: Frequency of drinking in a typical month

There were 73 people who reported that they ‘never’ drink in response to the question on frequency of drinking in a typical month. In addition, 10 people (0.6% of the sample) reported drinking 5-6 days of the week and 1 person reported drinking every day. These were excluded

from the hierarchical multiple regression. The effective sample size for this set of regressions was $N=1616$.

Single step regressions were first carried out for all predictor variables. The predictor variables of interest in this study were gender, age, living arrangement (a categorical variable dummy coded into three dichotomous variables namely, living with parents, living in a shared accommodation and living alone and independently), number of years at DIT, money available for drinking, age of first drink, drinking group size, frequency of weekly communication about alcohol, frequency of communication about alcohol in general and the perceived descriptive and injunctive norms for the 5 referent groups. Significant findings are summarized next.

<i>Dependent Variable: Frequency of drinking in a typical month</i>		
Independent Variables	R²	B (unstandardized)
Gender	0.012	0.73
Living in a shared accommodation	0.008	0.709
Living with parents	0.003	-0.372
Money available for drinking	0.093	0.03
Age of first drink	0.024	-0.31
Drinking group size	0.005	0.1
Weekly communication about alcohol	0.099	0.842
General communication about Alcohol	0.054	0.808
Descriptive norm for most students at DIT	0.049	0.193
Descriptive norm for close friends	0.243	0.42
Descriptive norm for best friend	0.223	0.354
Descriptive norm for mother	0.01	0.052
Descriptive norm for father	0.017	0.057
Injunctive norm for most students at DIT	0.006	0.31
Injunctive norm for close friends	0.045	0.751
Injunctive norm for best friend	0.045	0.688
Injunctive norm for mother	0.011	0.382
Injunctive norm for father	0.013	0.399

Table 12: Single set regressions for frequency of drinking in a typical month, significant at $p<0.05$

When entered on their own, the descriptive norm for close friends and best friend explained the most variance in the dependent variable (24.3% and 22.3% respectively). This was followed by money available for drinking (9.3%), weekly communication about alcohol (9.9%), general communication about alcohol (5.4%), descriptive norm for most students at DIT (4.9%) and the injunctive norms for close friends and best friend (4.5%). This step provided guidance about which predictor variables to retain in the hierarchical regression model.

6.4.3.1 Model 1

After the independent testing for each predictor variable, the following hierarchical multiple regression model was run. The goal was to try and increase the amount of variance explained by the model in the dependent variable in each block.

- Block 1: Gender, Living in a shared accommodation, living with parents
- Block 2: Money available for drinking, age of first drink, drinking group size, weekly communication about alcohol, general communication about alcohol
- Block 3: Descriptive norm for most students at DIT
- Block 4: Descriptive norm for close friends, Descriptive norm for best friend
- Block 5: Descriptive norm for mother, Descriptive norm for father

The model explained 40.8% of the variance in the dependent variable. The change in R^2 in each block is presented below.

Block	R ² change
1	0.023
2	0.182
3	0.046
4	0.154
5	0.004

Table 13: Change in R² for model 1 (first set of regressions)

Unstandardized regression coefficients for this model are presented next. DV denoted the dependent variable.

<i>DV: Frequency of Drinking (typical month)</i>	Unstandardized Regression Coefficients (B)				
Independent Variables	Block 1	Block 2	Block 3	Block 4	Block 5
Gender	0.778	0.466	0.645	-	-
Living with Parents	0.753	-	-	-	-
Living in a shared accommodation	1.295	0.967	1.065	0.745	0.771
Money available for drinking		0.026	0.025	0.02	0.02
Age of first drink		-0.157	-0.163	-	-
Drinking group size		-	-	-	-
Weekly communication about alcohol		0.616	0.565	0.423	0.428
General communication about Alcohol		0.269	0.323	-	-
Descriptive norm for most students at DIT			0.189	0.054	0.054
Descriptive norm for close friends				0.248	0.245
Descriptive norm for best friend				0.166	0.164
Descriptive norm for mother					-
Descriptive norm for father					-

Significant at p<0.05, (-) indicates no significant relationship

Table 14: Unstandardized regression coefficients for model 1 (first set of regressions)

Given the large sample size, an increment of at least 1% in the explained variance was set as a criterion to evaluate the significance of an effect on the dependent variable in following with Rimal and Real (2005). As can be seen, adding the descriptive norm for most students at DIT in block 3 improved R² by 4.6% compared to adding the descriptive norm for proximal peers

(close friends and best friend) in block 4 which improved R^2 by 15.4%. Addition of the descriptive norm for parents in block 5 improved the explained variance in the dependent variable by only 0.4% which is negligible.

Males and those who had their first drink at a younger age were found to be associated with higher frequencies of drinking in a typical month. However, these effects were no longer significant once the descriptive norms were introduced in the model. Also, living in a shared accommodation, more money a student had available for drinking and greater occurrence of alcohol/drinking in his/her weekly conversations were found to be associated with higher frequencies of drinking in a typical month. The results also reveal that the descriptive norms for proximal peers (close friends and best friend) were better predictors of frequency of drinking in a typical month than distal peers (most students at DIT). This supports past research (Baer et al., 1991; Thombs et al., 1997; Borsari and Carey, 2003; McAlaney, 2007; McAlaney and McMahon, 2007). The descriptive norms for mother and father were not found to be significant.

6.4.3.2 Model 2

Next, injunctive norms and descriptive norms were introduced into the model in successive steps with the injunctive norms preceding descriptive norms. This order of entry allowed estimation of the unique variance predicted by both types of norms after controlling for confounding factors. Further, this also provided a way to evaluate whether adding injunctive norms would improve the predictive ability of the overall model. Model 2 is presented below.

- Block 1: Gender, Living in a shared accommodation, living with parents

- Block 2: Money available for drinking, age of first drink, drinking group size, weekly communication about alcohol, general communication about alcohol
- Block 3: Injunctive norms for all peer groups
- Block 4: Descriptive norms for all peer groups

Model 2 explained 41.4% of the variance in the dependent variable, 0.6% higher than the last model. The change in R^2 in each block is presented below

Block	R^2 change
1	0.023
2	0.178
3	0.013
4	0.200

Table 15: Change in R^2 for model 2 (first set of regressions)

The table illustrates that adding injunctive norms in block 3 of the model increased the R^2 value by 1.3%.

Unstandardized regression coefficients for this model are presented next.

<i>DV: Frequency of Drinking (typical month)</i>	Unstandardized Regression Coefficients (B)			
	Block 1	Block 2	Block 3	Block 4
Independent Variables				
Gender	0.782	0.47	0.398	-
Living with Parents	0.709	-	-	-
Living in a shared accommodation	1.267	0.977	0.877	0.776
Money available for drinking		0.026	0.026	0.02
Age of first drink		-0.15	-0.119	-
Drinking group size		-	-	-
Weekly communication about alcohol		0.599	0.561	0.394
General communication about Alcohol		0.255	0.217	-
Injunctive norm for most students at DIT			-0.223	-
Injunctive norm for close friends			0.333	-
Injunctive norm for best friend			0.304	-
Injunctive norm for mother			-	-
Injunctive norm for father			-	-
Descriptive norm for most students at DIT				0.067
Descriptive norm for close friends				0.231
Descriptive norm for best friend				0.171
Descriptive norm for mother				-
Descriptive norm for father				-

Significant at $p < 0.05$, (-) indicates no significant relationship

Table 16: Unstandardized regression coefficients for model 2 (first set of regressions)

Other than the findings of model 1, this model reveals three key results.

First, of all the peer groups, only the perceived injunctive norms for proximal peers were found to positively predict one's frequency of drinking in a typical month in Block 3. A possible explanation for this can be that injunctive norms are suggested in the past research to be most influential within proximal social networks where social approval is particularly important and sought for maintaining group membership and cohesion (Trafimow and Finlay, 1996; Larimer et al., 2004a). Thus within tightly knit proximal groups, individuals might feel strongly motivated to follow injunctive norms.

Second, the injunctive norms of most students at DIT were found to be negatively related to one's frequency of drinking in a typical month in Block 3. This negative association of injunctive norms with personal consumption is also noted in the past research (Chawla et al., 2007; Neighbors et al., 2008). These studies found that the relationship between perceived injunctive norms and alcohol consumption was dependent on the normative referent group such that the perceived injunctive norms were negatively associated with alcohol consumption when the normative referent was distal (such as typical students) and positively associated when the normative referent is more proximal (such as close friends and family).

Third, injunctive norms lost their significance of predicting the dependent variable when descriptive norms were entered into the regression equation. This suggests that the predictive power of descriptive norms was stronger than that of injunctive norms. This finding also supports past research (Armitage and Conner, 2001; McAlaney, 2007; Neighbors et al., 2008).

6.4.4 Second set of regressions

Dependent variable: Number of drinks on a typical drinking occasion

69 people who reported drinking '0' drinks on a typical occasion and 1 case of missing value were excluded from the data set. The effective sample size for this set of regressions was N=1630.

A procedure similar to the first set of regressions was followed. Single set regressions were first carried out with predictor variables and the results are presented in Table 17.

When entered on their own in the regression equation, perceived descriptive norms for close friends explained the greatest variance (63.6%) in the dependent variable. This was followed by perceived descriptive norms of best friend (58.3%) and most students at DIT (39%), gender (18.7%) and the perceived injunctive norms for close friends and best friend (10.5% approximately).

<i>Dependent Variable: number of drinks on a typical occasion</i>		
Independent Variables	R²	B (unstandardized)
Gender	0.187	3.8
Age	0.006	0.123
Year in college	0.003	0.157
Money available for drinking	0.112	0.043
Age of first drink	0.064	-0.66
Drinking group size	0.007	0.058
Weekly communication about alcohol	0.077	0.978
General communication about Alcohol	0.041	0.93
Descriptive norm for most students at DIT	0.39	0.722
Descriptive norm for close friends	0.636	0.828
Descriptive norm for best friend	0.583	0.733
Descriptive norm for mother	0.059	0.396
Descriptive norm for father	0.096	0.33
Injunctive norm for most students at DIT	0.026	0.823
Injunctive norm for close friends	0.103	1.494
Injunctive norm for best friend	0.108	1.393
Injunctive norm for mother	0.021	0.683
Injunctive norm for father	0.03	0.781

Table 17: Single set regressions for number of drinks on a typical occasion, significant at $p < 0.05$

6.4.4.1 Model 1

Hierarchical multiple regression was then performed. The first model aimed at improving R^2 in each block and examining which peer group most strongly predicted the dependent variable.

The results are presented below

- Block 1: Gender, age, year in college
- Block 2: Money available for drinking, age of first drink, drinking group size, weekly communication about alcohol, general communication about alcohol
- Block 3: Descriptive norm for most students at DIT
- Block 4: Descriptive norm for close friends, Descriptive norm for best friend
- Block 5: Descriptive norm for mother, Descriptive norm for father

Over all, model 1 was able to explain 71.3% of the variance in the dependent variable. Block wise change in R^2 is presented below

Block	R^2 change
1	0.186
2	0.166
3	0.206
4	0.150
5	0.005

Table 18: Change in R^2 for model 1 (Second set of regressions)

The addition of perceived descriptive norm for most students at DIT in block 3 improved R^2 by 20.6% and the addition of perceived descriptive norm for close friends and best friend in block 4 improved R^2 by a further 15%. It indicates that both distal and proximal peers explain large

variance in the dependent variable. Adding perceived descriptive norm for mother and father in block 5, improved R^2 by 0.5% which is negligible.

At this stage, the residuals were examined for skew and kurtosis to make sure that the distribution did not deviate substantially from a normal curve. The standardized residuals within +/-4 standard deviations were retained to bring down the value for kurtosis. 4 such cases were excluded. This improved R^2 by 1.3%.

The unstandardized regression coefficients are presented next

Independent Variables	Unstandardized Regression Coefficients (B)				
	Block 1	Block 2	Block 3	Block 4	Block 5
Gender	3.757	3.46	2.47	1.13	1.15
Age	-	-	-	-	-
Year in college	-	-	-	-	-
Money available for drinking		0.029	0.021	0.013	0.012
Age of first drink		-0.412	-0.296	-0.128	-0.111
Drinking group size		0.029*	-	-	-
Weekly communication about alcohol		0.501	0.404	0.231	0.227
General communication about Alcohol		0.515	0.449	0.265	0.266
Descriptive norm for most students at DIT			0.553	0.127	0.114
Descriptive norm for close friends				0.413	0.408
Descriptive norm for best friend				0.213	0.223
Descriptive norm for mother					-
Descriptive norm for father					0.067

p<0.01, *p<0.05, (-) indicates no significant relationship

Table 19: Unstandardized regression coefficients for model 1

(Second set of regressions)

More money available for drinking, having the first drink at a younger age and greater frequencies of weekly and general conversations about alcohol were found to be associated with greater number of drinks an individual would consume on a typical drinking occasion.

Also, a strong gender effect was noticed with being a male predicting an increase of 1.15 drinks on a typical drinking occasion after having controlled for confounding factors. Drinking in bigger groups was also found to be associated with greater number of drinks an individual had on a drinking occasion. However, this effect was no longer significant once the perceived descriptive norms were entered into the equation.

Among descriptive normative beliefs, greater perceptions of prevalence of drinking in peers was found to be associated with greater number of drinks an individual would consume on a typical drinking occasion. The only exception was the perceived descriptive norm for mother which was not found to be significant. Perceived descriptive norm for father produced a small effect. Further, perceived descriptive norms for proximal peers (close friends and best friend) were found to be better predictors of the dependent variable than those for distal peers (most students at DIT).

6.4.4.2 Model 2

Next, perceived injunctive norms for all peer groups were included in Block 3 and perceived descriptive norms for all peer groups were included in block 4. Those variables which were not found to be significant in model 1 were also excluded (namely age and year in college from block 1 and drinking group size in block 2). Model 2 looked took the following form.

- Block 1: Gender, money available for drinking, age of first drink, weekly communication about alcohol, general communication about alcohol
- Block 2: Injunctive norms for all peer groups
- Block 3: Descriptive norms for all peer groups

Model 2 was able to explain 73% variance in the dependent variable. Block wise change in R^2 is presented below:

Block	R^2 change
1	0.352
2	0.044
3	0.334

Table 20: Change in R^2 for model 2 (Second set of regressions)

Adding perceptions of injunctive norms in block 2 improved R^2 by 4.4% compared to the addition of perceived descriptive norms in block 3 which improved R^2 by 33.4%.

Unstandardized regression coefficients are presented next:

Independent Variables	Unstandardized Coefficients (B)		
	Block 1	Block 2	Block 3
Gender	3.489	3.365	1.078
Money available for drinking	0.031	0.029	0.012
Age of first drink	-0.413	-0.333	-0.088*
Weekly communication about alcohol	0.499	0.366	0.225
General communication about Alcohol	0.48	0.354	0.207
Injunctive norm for most students at DIT		-	-
Injunctive norm for close friends		0.53	-
Injunctive norm for best friend		0.57	-
Injunctive norm for mother		-	-
Injunctive norm for father		-	-
Descriptive norm for most students at DIT			0.11
Descriptive norm for close friends			0.42
Descriptive norm for best friend			0.22
Descriptive norm for mother			-
Descriptive norm for father			-

$p < 0.01$, * $p < 0.05$, (-) indicates no significant relationship

Table 21: Unstandardized regression coefficients for model 2 (Second set of regressions)

In addition to the findings of model 1, this model reveals two key results.

First, perceived injunctive norms of close friends and best friend were found to be significant in block 2 such that a unit increase in either caused an increase of about 0.5 drinks individuals would have on a typical drinking occasion. This finding is similar to that observed in model 2 in the first set of regressions performed on the frequency of drinking in a typical month as a dependent variable (section 6.4.3.2). Similar explanation therefore applies. However, similar to the first set of regressions, perceived injunctive norms lost their predictive effect once perceived descriptive norms were added into the regression equation in block 3. This suggests greater predictive power of perceptions of descriptive norms over those of injunctive norms.

Two, in line with past research (Baer et al., 1991; Thombs et al., 1997; Borsari and Carey, 2003; McAlaney, 2007; McAlaney and McMahon, 2007), perceptions of descriptive norms of proximal peers (close friends and best friend) predicted personal consumption more strongly than those of distal peers (most students at DIT).

6.4.5 Third set of regressions

Dependent variable: Frequency of drunkenness in a typical month

99 people reported that they never drink enough alcohol to get drunk in a typical month. Theoretically speaking, these could be treated as abstainers and removed from the regression analysis. However, in reality, some of these people might not have meant that they don't drink alcohol at all. They might have just meant that they do drink alcohol but never go to the extent of getting drunk and hence chose 'never' as their answer. Cross tabs were examined between the frequency of drinking and drunkenness in a typical month. Those who reported never in

both questions were excluded. Further, those who reported drinking enough alcohol to get drunk everyday of the month (n=1) or 5-6 days a week (n=4) were treated as outliers and were also excluded from the analysis as they represented a negligible percentage of the sample and skewed the underlying distribution. The final sample size subjected to regression analysis was N=1623.

Following the same steps as before, single step regressions were first carried out with each predictor variable. The results are as follows.

<i>Dependent Variable: Frequency of drinking to get drunk in a typical month</i>		
Independent Variables	R²	B (unstandardized)
Gender	0.006	0.442
Age	0.015	-0.118
Year in college	0.001	-0.054
Living alone or independently	0.003	-0.888
Money available for drinking	0.085	0.024
Age of first drink	0.041	-0.334
Drinking group size	0.013	0.047
Weekly communication about alcohol	0.166	0.911
General communication about Alcohol	0.101	0.94
Descriptive norm for most students at DIT	0.014	0.087
Descriptive norm for close friends	0.138	0.265
Descriptive norm for best friend	0.13	0.223
Descriptive norm for mother	0.008	0.037
Descriptive norm for father	0.013	0.043
Injunctive norm for most students at DIT	0.043	0.663
Injunctive norm for close friends	0.139	1.11
Injunctive norm for best friend	0.142	1.016
Injunctive norm for mother	0.023	0.468
Injunctive norm for father	0.018	0.391

Table 22: Single set regressions for frequency of drunkenness in a typical month, significant at $p < 0.05$

As can be seen from Table 22, greatest variance (16.6%) in the dependent variable was explained by weekly conversations regarding alcohol followed by perceived descriptive and injunctive norms for proximal peers (almost 14%). Money available for drinking was next explaining 8.5% variance in the dependent variable.

6.4.5.1 Model 1:

Next, based on the knowledge from single set regressions, a full model was run, aimed at increasing R^2 in each block and examining the predictive strength of perceived descriptive norms for the 5 reference groups. Model 1 is presented below:

- Block 1: Gender, age, year in college, living alone and independently
- Block 2: Money available for drinking, age of first drink, drinking group size, weekly communication about alcohol, general communication about alcohol.
- Block 3: Descriptive norm for most students at DIT
- Block 4: Descriptive norm for close friends, descriptive norm for best friend
- Block 5: descriptive norm for mother, descriptive norm for father

Model 1 explained 47.8% variance in the dependent variable. Block wise change in R^2 is presented next.

Block	R^2 change
1	0.02
2	0.23
3	0.10
4	0.12
5	0.00

Table 23: Change in R^2 for model 1 (Third set of regressions)

As can be seen from Table 23, block 5 did not improve R^2 any further. Perceived descriptive norms for both parents were therefore dropped from subsequent models.

The unstandardized regression coefficients for the significant relationships in model 1 are presented next.

Independent Variables	Unstandardized Regression Coefficients (B)				
	Block 1	Block 2	Block 3	Block 4	Block 5
Gender	0.604	0.305*	0.505	-	-
Age	-0.118	-0.074	-0.097	-0.057	-0.058
Money available for drinking		0.021	0.018	0.014	0.014
Age of first drink		-0.162	-0.139	-	-
Weekly communication about alcohol		0.655	0.56	0.457	0.457
General communication about Alcohol		0.277	0.23	0.144*	-
Descriptive norm for most students at DIT			0.28	0.113	0.113
Descriptive norm for close friends				0.267	0.267
Descriptive norm for best friend				0.112	0.112

p<0.01, *p<0.05, (-) indicates no significant relationship

Table 24: Unstandardized regression coefficients for model 1

(Third set of regressions)

More money available for drinking, older age and higher frequencies of general and weekly conversations regarding alcohol were found to be associated with higher frequencies of drinking enough alcohol to get drunk in a typical month. Being male and having started drinking at a younger age were also associated with higher frequencies of drinking enough alcohol to get drunk in a typical month. However, these variables lost their predictive effect when perceived descriptive norms for proximal peers (close friends and best friend) were entered into the model in block 4. Among normative mechanisms, higher perceptions of

prevalence of drinking enough alcohol to get drunk in distal and proximal peers was found to be associated with higher frequencies of drunkenness. Perceived descriptive norms for close friends were more strongly associated with personal drinking behaviour compared to those for most students at DIT and best friend.

6.4.5.2 Model 2:

In order to examine the predictive power of perceived injunctive norms, another full model was run with slight modifications. One, year in college and living alone and independently were removed from block 1 as they were not found to be significant in model 1. Similarly, drinking group size was removed from block 2. Two, block 1 and block 2 variables were merged into one block, now block 1. Third, perceived injunctive norms for all peer groups were included in block 2 and perceived descriptive norms for all peer groups (except for both parents) were added in block 3. The model took the following form.

- Block 1: Gender, age, money available for drinking, age of first drink, weekly communication about alcohol, general communication about alcohol
- Block 2: Injunctive norms for all peer groups
- Block 3: Descriptive norm for most students at DIT, descriptive norm for close friends, descriptive norm for best friend.

This model explained 49.8% variance in the dependent variable, 2% higher than model 1.

At this stage, standardized residuals were examined to ensure that the underlying distribution did not deviate substantially from normality. The value for kurtosis exceeded the acceptable range. To rectify this, standardized residuals outside +/-4 standard deviations were excluded. There were 6 such cases. Model 2 was rerun and it was noticed that removal of these cases

improved R^2 by 2.5%. The re-examination of standardized residuals revealed that kurtosis was now within the acceptable range. A square root transformation of the dependent variable was also attempted to bring down the value of kurtosis even further. The details of this procedure and relevant comparison plots are provided in appendix 7. Given similar results and negligible increase in R^2 , untransformed values for regression coefficients are reported here for ease of interpretation.. Overall, the model was able to explain 52.6% of the variance in dependent variable. Block wise change in R^2 and unstandardized regression coefficients follow

Block	R^2 change
1	0.259
2	0.058
3	0.209

Table 25: Change in R^2 for model 2 (Third set of regressions)

Independent Variables	Unstandardized Coefficients (B)		
	Block 1	Block 2	Block 3
Gender	0.284*	-	-
Age	-0.098	-0.093	-0.077
Money available for drinking	0.022	0.019	0.014
Age of first drink	-0.188	-0.125	-0.032
Weekly communication about alcohol	0.605	0.506	0.358
General communication about Alcohol	0.314	0.216	-
Injunctive norm for most students at DIT		-	-
Injunctive norm for close friends		0.384	0.161*
Injunctive norm for best friend		0.362	0.186*
Injunctive norm for mother		-	0.05*
Injunctive norm for father		-	-
Descriptive norm for most students at DIT			0.106
Descriptive norm for close friends			0.275
Descriptive norm for best friend			0.183

p<0.01, *p<0.05, (-) indicates no significant relationship

Table 26: Unstandardized regression coefficients for model 2 (Third set of regressions)

Table 26 indicates four key results. First, more money available for drinking, older age, having had the first alcoholic drink at a younger age and weekly and general conversations regarding alcohol were found to be associated with higher frequencies of drunkenness in a typical month. Being male was also associated with higher frequencies of drunkenness but the effect lost its significance once the normative mechanisms were entered in the regression equation in block 2. Second, higher perceptions of injunctive norms for proximal peers were found to be significantly associated with higher frequencies of drunkenness. Third, perceived injunctive norms for close friends lost their predictive power when descriptive norms were entered into the equation in case of other dependent variables. At the same time, higher perceptions of injunctive norms for mother were found to be associated with higher frequencies of drunkenness in block 3, an effect which wasn't noticed in earlier blocks. Fourth, higher perceptions of descriptive norms for distal and proximal peers were found to be significantly associated with higher frequencies of drunkenness with the predictive strength of the norm for proximal peers being greater than that of distal peers.

6.5 Conclusion

Ireland is known for its infamous drinking culture which is a key element of social life for its people. The results presented in this chapter demonstrate the prevalence of heavy drinking among DIT students with the campus norm being drinking approximately 5 days a month, consuming nearly 9 drinks on a typical occasion and getting drunk every week. As explained in chapter 5, section 5.5.6.2, the measures for personal consumption and perceptions of the descriptive norm used in this study are largely similar to McAlaney and McMahan (2007). The comparison of the campus norm for DIT with that of the sample from McAlaney and

McMahon (2007) shows that DIT students consume twice as many drinks on a typical occasion and get drunk twice as frequently in a typical month as their British counterparts. The results also confirm the relevance of underage drinking in Irish policy making as it was found to be commonplace in DIT with 94% of those surveyed reporting that they started drinking before they turned 18.

The findings demonstrate that the respondents generally overestimated the prevalence of drinking among other students perceiving them to drink almost twice as often and getting drunk twice as frequently as they themselves in a typical month and consuming at least 1 additional drink on a typical drinking occasion. The extent of these misperceptions is comparable to the results reported in McAlaney and McMahon (2007) and to those reported in American college based studies such as Thombs et al (2005). These two studies are broadly similar to the current research as both were conducted at campuses primarily attended by students who commute to campus. Overall, the respondents in the current study and both McAlaney and McMahon (2007) and Thombs et al (2005) perceived other students as becoming drunk nearly twice as frequently as they themselves. Further, the results suggest that the respondents also perceived their proximal peers to have more permissive drinking behaviours than they themselves. However, the gap between participants' own drinking behaviours and their perceptions of the behaviour rose as social referents became more distal. These trends were found to be consistent for both males and females, abstainers as well as across all campuses of DIT.

The results presented in this chapter also provided evidence to support the effect of perceived descriptive norms on personal consumption of alcohol. This effect was found to be stronger for

proximal peers than distal peers. Further, perceptions of parental norms were not found to have a significant effect on participants' own consumption. These results support the past research which documents misperceptions of norms and investigates their association with personal behaviour (Perkins, 1985; Berkowitz and Perkins, 1986a; Marks et al., 1992; Wood et al., 1992; Beck and Treiman, 1996; Perkins and Wechsler, 1996; Thombs et al., 1997; Nagoshi, 1999; Page et al., 1999; Clapp and McDonnell, 2000; Botvin et al., 2001; D Amico et al., 2001; Sher et al., 2001; Korcuska and Thombs, 2003; McAlaney and McMahon, 2007; Page et al., 2008). The hierarchical multiple regressions also revealed some other effects. Specifically, having more money available for drinking and higher frequency of engaging in drink related conversations were associated with higher personal consumption. Being male and having had the first drink at a younger age were found to be associated with greater number of drinks consumed on a typical occasion. Living in a shared accommodation predicted higher frequency of drinking in a typical month while being older predicted lower frequency of drunkenness in a typical month.

Further, the results presented in this chapter provide evidence in support of perceived descriptive norms having a greater effect on personal consumption than perceived injunctive norms. Although, higher perceptions of approval for drinking to get drunk among proximal peers (perceived injunctive norms) were found to be associated with higher personal consumption, these effects disappeared when perceived descriptive norms were introduced into the regression equations. The only exceptions were the perceived injunctive norm for proximal peers and mother when they predicted individuals' frequency of drunkenness in a typical month. Further, perceived descriptive norms were able to explain a much higher proportion of variance in personal consumption compared to perceived injunctive norms.

The implications of these findings and their contributions to the SN theory would be discussed more fully in chapter 9.

7 Network Analysis and Results: Second Wave

7.1 Introduction

SN researchers consistently emphasize the importance of identifying significant social referents and placing these associations in appropriate contexts to understand how and why they are so salient (McAlaney et al., 2011). These are important questions but the complex and multifaceted nature of human relations makes it difficult to examine these details of individuals' social lives following conventional survey methodology. SNA offers a way to address this issue of norm salience as discussed in detail in chapter 4, section 4.4. The powerful mathematical techniques embedded in graph theory and the ability to visualize networks is the strength of network science which also makes it the best available method for examining relational patterns.

The ego networks examined in this study were generated from 26 in depth interviews as explained in chapter 5, section 5.6. The current chapter is aimed at addressing the issue of norm salience by identifying and locating the most salient peers in the extracted ego networks. The results presented in this chapter are based on the analysis of network composition and structure combined with a qualitative interpretation of the interviews. It begins by providing an overview of the sample and describing the composition of examined networks. It then assesses the strength of network relationships by examining participant generated tie strength scores and the subjective meanings associated with these ties. An analysis of structural configurations of these networks is presented in parallel. In this regards, five distinct structural typologies are

identified and explained with the help of specific cases and network visualizations. The chapter concludes with a brief discussion of the key findings.

Chapter 8 will examine the association of these salient relationships with participants' normative perceptions and their drinking behaviours. In doing so, it will also extend the discussion of cases described here to explore how drink related behaviours and attitudes developed and sustained in these networks. A cross case analysis will also be presented.

7.2 Sample Overview

Of the 26 students who participated in the interviews, there were 15 females and 11 males. The average age of the sample was 20 years, the average age of females being 20 years and that of males being 21 years. This difference is due to the fact that more females than males had spent 2 years or less in college. All participants were Irish and full time under graduate students at DIT Aungier Street campus. 18 participants belonged to the high drinking cohort, 7 to the moderate drinking cohort and only 1 participant belonged to the low drinking cohort. The observation that only 1 participant belonged to the low drinking cohort is not surprising as only 3 respondents (from the web survey) based at Aungier Street campus fit the criteria for low intensity drinkers only 1 of whom agreed to participate in stage 2.

The cut off points for these cohorts were determined on the basis of the criteria outlined in chapter 5, section 5.6.1 and reproduced in Table 27 for convenience.

	Frequency of drinking	No. of drinks (per occasion)	Frequency of Drunkenness
Low intensity drinkers	Once a month or less	2 drinks or less	Once a month or less frequently
Moderate intensity drinkers	Exceeded low intensity drinkers on one or more of these items but did not meet the criteria for high intensity drinkers		
High intensity drinkers	Once a week or more	5 or more drinks	Once a week or more

Table 27: Drinking Intensity Criteria for the Current Study

7.3 Network Analysis

Before going into the structural and contextual details of ego networks, it will be useful to develop a feel of the data by providing a general overview of network composition. Three networks were examined for each participant based on the name generators used in this study. The choice of these name generators is described in chapter 5, section 5.6.3.2. The first name generator extracted networks of people with whom the participants shared important matters (referred to as the important discussants' network). The second name generator produced networks of people with whom the participants liked socializing or partying (referred to as the socialization network). The third name generator asked the participants if they wanted to name anyone else who was especially close to them and who they did not mention in the first two questions. Based on the data from these name generators, an overall ego network was generated for each participant, which included everyone that they had named during the interview (referred to as the Overall network).

UCINET software (Borgatti et al., 2002) was used to conduct network analysis in this study. UCINET stores network data in matrix format. For illustration purposes, the following image depicts the overall network of a participant named Ruth in matrix format.

	1	2	3	4	5	6	7	8	9	10	11	12
	Ruth	71	72	73	74	75	76	77	78	79	710	711
1	Ruth											
2	71	1.000										
3	72	1.000	1.000									
4	73	1.000	1.000	1.000								
5	74	1.000	1.000	1.000	1.000							
6	75	1.000	1.000	1.000	1.000	1.000						
7	76	1.000	0.000	0.000	0.000	1.000	1.000					
8	77	1.000	0.000	0.000	0.000	0.000	0.000	0.000				
9	78	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
10	79	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000		
11	710	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000	
12	711	1.000	1.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000

12 rows, 12 columns, 1 levels.

 Running time: 00:00:01 seconds.
 Output generated: 14 Nov 12 11:15:44
 UCINET 6.414 Copyright (c) 1992-2012 Analytic Technologies

Figure 10: Example of UCINET matrix²⁰

The matrix indicates that Ruth’s network comprises 11 people (persons 71-711). The presence of ‘1’ in a cell indicates that a tie exists between the corresponding nodes whereas ‘0’ depicts that there is no relationship between the two nodes. Similar matrices were created to represent the important discussants’, socialization and overall networks of each participant. These matrices were then used to calculate specific network measures in UCINET (Borgatti et al., 2002) and to create network visualizations in NetDraw (Borgatti, 2002) which were then assessed in combination with interview accounts to understand how these networks functioned.

²⁰ Based on data from the present study

7.4 Overview of Network Composition

7.4.1 Size and Effective Size of Ego Networks

A basic indicator of interest in SNA is network size. The size of a network is determined by the number of direct ties involving individual units (Marsden, 1990). In simple words, it is the number of members in an individual's network referred to as 'degree' in network terminology.

Effective size on the other hand, is a measure of network cohesion. It describes how cohesive or connected a given network is. It is calculated as

$$\text{Eff Size} = \text{Degree of Ego} - \frac{\text{Total number of ties between alters (exclding ties to ego)}}{\text{Degree of Ego}}$$

A higher effective size means that a network is less connected. A lower effective size conversely represents a network that is well connected with 1 being the highest value indicating that everyone is connected to everyone in the network.

For clarity, consider the following two cases

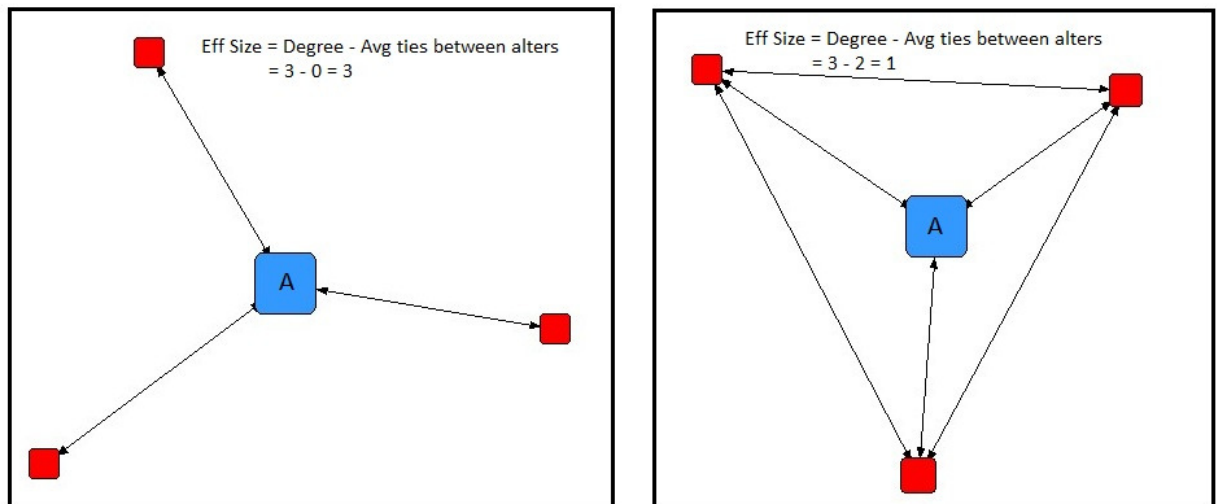


Figure 11: Effective size in a 3 mode network

In the first case A has ties to three other actors. None of these three actors has ties to any of the others. The effective size of A's network is $3 - (0/3) = 3$. Alternatively, suppose that A has ties to three others, and that all of the others are tied to one another. A's network size is three, but the ties are "redundant" because everyone can reach all three neighbours by reaching any one of them. The total number of ties between alters is 6 (each alter is tied to two other alters). Hence, the effective size of this network is $3 - (6/3) = 1$.

The size and effective size of the 26 ego networks examined in this study are presented in Table 28. Pseudo names have been used to indicate each participant in order to protect their identities.

Respondent	Gender	Drinking Cohort	Socialization Network		Important Discussants' Network		Overall Network		
			Size	Effective Size	Size	Effective Size	Size	Effective Size	
1	Mary	F	H	20	13.4	20	8.6	32	20.3
2	Emma	F	H	16	9.9	16	9.3	20	12.8
3	Helen	F	H	17	11.1	9	2.3	20	11
4	Ruth	F	L	5	1.8	11	6.6	11	6.6
5	Linda	F	H	17	8.9	9	2.3	20	10
6	Edel	F	H	10	3.6	11	3.6	13	5.2
7	Pam	F	H	15	9	7	3.6	17	10.9
8	Sue	F	H	6	1.7	3	1	7	2.4
9	Debbie	F	H	13	7.8	8	3	17	9.4
10	Meg	F	M	12	6.3	12	5.2	19	8.6
11	Fay	F	H	13	5	17	7.2	20	10.5
12	Bella	F	H	9	2.6	9	2.3	10	2.4
13	Katie	F	H	12	5	11	1.7	18	6.2
14	Amy	F	M	14	8	12	6	20	12.3
15	Lisa	F	H	11	6.5	13	4.1	24	8.1
16	Tom	M	H	20	8.8	10	5	23	10.6
17	Peter	M	M	10	6	3	1.7	13	8.7
18	Sam	M	H	19	8.6	13	5.2	26	12.8
19	Alex	M	M	4	2.5	4	2	5	2.6
20	John	M	H	16	4.6	15	4.7	23	6.3
21	Adam	M	M	10	1	14	1	18	3.7
22	Brian	M	H	13	2.7	6	2.3	14	4
23	Cormac	M	M	13	10.1	10	7.4	21	15.5
24	Gary	M	H	6	2.3	11	6.3	12	7
25	Rob	M	H	13	8.5	12	8.3	17	10.8
26	Ken	M	M	8	1	8	1	17	4.2

Table 28: Size and effective size of the examined ego networks. Gender: Female (F), Male (M), Drinking Cohort: High Intensity (H), Moderate Intensity (M), Low Intensity (L)

The average size of ‘overall networks’ was 17.6 nodes²¹, where the smallest network comprised 5 nodes and the largest comprised 32 nodes. This reflects a lot of variation (SD: 6.0) in networks with respect to size. Overall, the ‘important discussants networks’ of females (mean: 11.2) were slightly wider compared to those of males (mean: 9.6). These results contrast with Moore (1990) who found men and women to have much smaller (mean: 3) but similar sized networks of people with whom they discussed important matters. However, Moore’s study was based on a national sample as opposed to the current study which was restricted to DIT students only. It can be argued that network size is dependent on several factors such as choice of name generators, population of interest and their age group. The ‘socialization networks’ and the ‘overall networks’ of males and females, on the other hand were found to be similar with regards to size (means: 12 and 17 respectively for both males and females).

Table 28 indicates that in most cases, the ‘important discussants networks’ were found to be more connected (Mean 4.5) than the ‘socialization networks’ (Mean 6). This is because the important discussants’ networks generally comprised older and stronger ties such as family and friends with whom the participants grew up or with whom they went to school. Generally, these people knew the participants and each other for many years and in contexts outside of college. The socialization networks on the other hand typically comprised subgroups of a variety of people with whom the participants interact in various contexts in their day to day lives.

²¹ Please refer to the ‘Glossary of Common Network Terms’ in appendix 9 for definition.

7.4.2 Referent Group Composition of Ego Networks

A variety of peer groups emerged in the ego networks of participants in response to the name generators. The following table (next page) presents the percentage distribution of different referent groups in the overall network of each participant.

Respondent		School or Area or childhood Friends %	College Friends %	Work Mates %	Flat Mates %	Family %	Other Friends Outside College ²² %	Activity Friends ²³ %	Important Discussants Outside College (%)	Overlapping Peers or Nodes Outside College (%)
1	Mary	41	15	9		19		16	95	100
2	Emma	5	50			20	25		50	50
3	Helen	55	5	25		15			89	86
4	Ruth	18	18			27	37		82	100
5	Linda	15	10	15		35	25		100	100
6	Edel	47	23			15	15		91	100
7	Pam	47				12	12	29	88	80
8	Sue	43	14			14	29		100	100
9	Debbie	54	29			12	5		88	75
10	Meg	37	26			16		21	75	75
11	Fay	35	30		10	10	15		71	70
12	Bella	60	30			10			67	63
13	Katie	57	22	5		11	5		100	100
14	Amy	35	35	15		10	5		75	67
15	Lisa	67	8			8	17		91	88
16	Tom	31	4	52		4	9		90	86
17	Peter		15	31		23	31		100	100
18	Sam	43	38			11	8		77	50
19	Alex	20	20			20	40		75	67
20	John	30	22			13	35		67	63
21	Adam	39				44	17		100	100
22	Brian	79					21		100	100
23	Cormac	28	5	24	10	19	14		100	100
24	Gary	58	17			25			91	83
25	Rob		29	29		13		29	67	56
26	Ken	59				35	6		100	100

Table 29: Peer group composition (%) based on overall network size.

²² The category ‘other friends from outside college’ included (1) boyfriends or girlfriends who didn’t fit any other peer group category (2) friends of friends and (3) people with whom the participants became friends in a particular context for example Ruth has a friend who she sees every Saturday in a dance class and Adam is friends with three girls with whom he and his friends like clubbing.

²³ The category ‘activity friends’ included friends who the participants made through membership in a specific club or activity outside of college for example Pam is member of a juggling society and Mary is part of a hockey club outside DIT.

Table 29 draws attention to three key findings.

First, in general, the participants named more peers from outside college than from within college. The only exception to this was Emma who named as many people from within college as from outside.

Second, in general, the important discussants' networks comprised ties from outside college. In 13 cases of the 'important discussants' networks', 90% or more peers were from outside college whereas in 9 cases, between 70 and 90% peers were from outside college. In the remaining 4 cases, between 50 and 70% peers were from outside college.

Third, in general, people who were named in both 'important discussants' and 'socialization' networks (referred to as 'overlapping peers or nodes' in Table 29) were related to the participants in contexts outside of college. This was consistent across all networks with 11 cases comprising 90% or more, 8 cases comprising 70-90% and 7 cases comprising 50-80% of overlapping peers from outside college.

The finding that college friends did not appear as frequently and as dominantly in the ego networks as did peers from outside college suggests the possibility that perhaps the latter are more relevant and salient to the participants - a point that will be explored more fully in section 7.6. These results also validate the web survey where 86% of the sample reported having friends from outside college among the people with whom they usually engaged in drink related socialization.

70% participants mentioned either or both their parents among people with whom they shared important matters and 61% mentioned their siblings in either or both name generators.

7.4.3 Gender and Age Composition of the Ego Networks

Table 30 indicates the number of network members named by gender during the interviews.

Number of People Named by Gender				
	Male Alters		Female Alters	Total
Male Egos				
Absolute Value	117		72	189
% value	62%		38%	100%
Female Egos				
Absolute Value	82		186	268
% value	30%		70%	100%
Total				
Absolute Value	199		258	457
% value	43%		57%	100%

Table 30: Number of people named by gender. Total of values in rows: total amount of people named by ego gender, Total of values in columns: total amount of males and females named.

Overall, the participants named 457 alters; 199 were male and 258 were female. Male participants (11 cases) named 189 alters of whom 117 were male and 72 were female. Female participants named 268 alters of whom 82 were male and 186 were female. These findings are consistent with Bellotti (2008) and reflect that overall, the participants named more same gender friends than opposite gender friends.

The average age of network members was 24 years compared to an average age 20 years for the participants. The networks reflected that participants mostly socialized with people their own age although it may seem from the average figures that they interacted more with those of

an older age group. This is because many people mentioned their parents and other family (such as older siblings, uncles and aunts) in their ‘important discussants’ networks’ which subsequently raised the average. Kinship ties may not be categorized as friends who participants would usually socialize with. Yet, being important sources of advice and support as reflected in section 7.6, they appeared to play a significant role in the participants’ lives.

7.5 Evaluation of Tie Strength

The strength of relationships that the participants shared with their network members was examined to identify the most salient peers in the given networks. The evaluation of tie strength was based on two sources of information.

First, during the interviews, participants were asked to position their network members on a diagram of 6 concentric circles based on how close they felt towards each member (refer to chapter 5, section 5.6.5.2 for a detailed discussion on the procedure and its rationale). This exercise generated participant aided numerical scores of tie strength ranging between 6 (strongest tie) and 1 (weakest tie). The tie strength scores for each of the 26 networks are presented in appendix 10. The people with whom the participants felt extremely close comprised approximately 43% (7 people) of the size of their networks. This is supported by past research which found most American people to have about 6 close social contacts (Christakis and Fowler, 2009).

Second, the qualitative accounts were examined to understand the meanings and sentiments participants associated with these relationships. This qualitative interpretation provided context to the aforementioned numerical scores by offering useful insights into why participants

perceived some ties to be stronger and more intimate than others. This will be explained further with the help of examples and network visualizations in the following section, which presents a structural and contextual analysis of networks in parallel with an evaluation of tie strength.

7.6 Variations in Network Structures

The analysis of network structures complemented by interview accounts draws attention to five main typologies of networks. This categorization was partially based on how the participants described their networks, how they interacted and socialized with their network members and strength of these relationships. The five network typologies encountered in this study were

1. The Small clique
2. The Overlapping cliques
3. The Group
4. The Core/Periphery
5. The Contextualized network

Four of these typologies namely the small clique, the group, the core/periphery and the contextualized network were derived from (Bellotti, 2008), which is an ego network study of friendship networks among single people in Milan. Since the current study elicited ego networks based on ‘discussing important matters’ and ‘socializing’, of which friendship ties are an imperative element among others, the structural types outlined in Bellotti (2008) were deemed suitable for our purposes. That being said, some adaptations were made to the conceptualizations of these typologies to suit the current context, a point that will be addressed

shortly. The fifth typology namely, the overlapping cliques, emerged during the analysis as distinct from Bellotti (2008) and the one which appeared the most frequently.

Table 31 summarizes the structure type of each ego network examined.

Respondent		Drinking Cohort	Socialization Network	Important Discussants' Network	Overall Network
1	Mary	H	Overlapping cliques	Overlapping cliques	Overlapping cliques
2	Emma	H	Overlapping cliques	Overlapping cliques	Overlapping cliques
3	Helen	H	Overlapping cliques	Overlapping cliques	Overlapping cliques
4	Ruth	L	Overlapping cliques	contextualized network	contextualized network
5	Linda	H	Core and periphery	Overlapping cliques	Core and periphery
6	Edel	H	Overlapping cliques	Overlapping cliques	Overlapping cliques
7	Pam	H	Overlapping cliques	Overlapping cliques	Overlapping cliques
8	Sue	H	Overlapping cliques	Small Clique	Overlapping cliques
9	Debbie	H	Overlapping cliques	contextualized network	Overlapping cliques
10	Meg	M	Overlapping cliques	Overlapping cliques	Overlapping cliques
11	Fay	H	Group	Group	Group
12	Bella	H	Overlapping cliques	Overlapping cliques	Overlapping cliques
13	Katie	H	Group	Group	Group
14	Amy	M	Overlapping cliques	Overlapping cliques	Overlapping cliques
15	Lisa	H	Group	Group	Group
16	Tom	H	Overlapping cliques	Overlapping cliques	Overlapping cliques
17	Peter	M	Overlapping cliques	contextualized network	Overlapping cliques
18	Sam	H	Overlapping cliques	Overlapping cliques	Overlapping cliques
19	Alex	M	Small Clique	Small Clique	Small Clique
20	John	H	Overlapping cliques	Overlapping cliques	Overlapping cliques
21	Adam	M	Group	Group	Group
22	Brian	H	Group	Overlapping cliques	Group
23	Cormac	M	Contextualized Network	contextualized network	Overlapping cliques
24	Gary	H	Core and periphery	Group	Core and periphery
25	Rob	H	Contextualized Network	contextualized network	Overlapping cliques
26	Ken	M	Group	Group	Group

Table 31: Summary of the structures found. Pink: Females, Blue: Males. Drinking Cohort: High (H), Moderate (M), Low (L)

Some cases that best illustrate the typologies are presented next.

7.6.1 The Small Cliques

In social psychology, the word "clique" is often used to describe a group of 2 to 12 (averaging 5 or 6) people who interact with each other more regularly and intensely than with others in the same setting (Salkind, 2008). The concept of a clique in network science is more narrow and precise. It is termed as a complete sub graph of at least three nodes without an upper size limit (Wasserman and Faust, 2007). Simply put, it is a group of at least three people where everyone knows everyone. While a clique has to have at least three members, there is no limit on the maximum size.

‘Small cliques’ as the name suggests, have two features which distinguished these networks from the other typologies. First, the size of such networks was small compared to other networks in the data set. The minimum network size for a small clique was 3 nodes while the maximum was noted to be 5 nodes. Second, the nodes in such networks were arranged in the form of one or more cliques where each clique had 3 members at the most. This conception varies from Bellotti (2008) who found the maximum size of such networks to be 3 nodes based on her data compared to that of 5 nodes as noted in this study.

Of all the participants, only Alex was found to have all three networks (‘important discussants’ network’, ‘socialization network’ and the ‘overall network’) shaped in this way. Another example of this typology is the ‘important discussants’ network’ of Sue, an 18 year old heavy drinking female who had been going to DIT for less than a year at the time of the interview. Sue lives in a shared accommodation in Dublin and named 3 females in her ‘important discussants’ network’ who all know each other forming a clique. Sue knows all three of them in contexts outside of college.

Sue's important discussants' network is depicted in the following visualization.

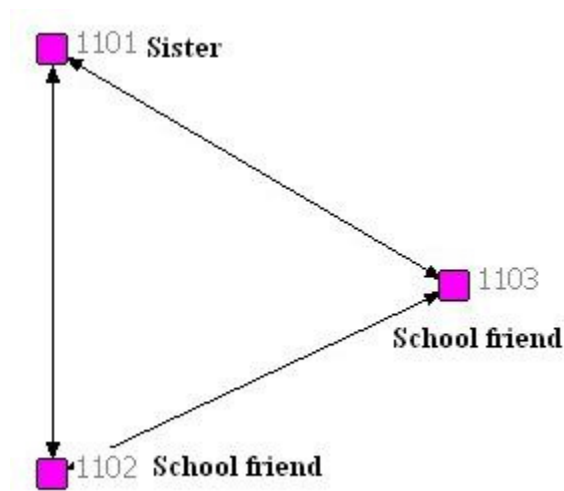


Figure 12: Sue's important discussants' network: A small clique

Person 1101 who is 5 years older than Sue is her elder sister. Person 1102, whom Sue has known for 6 years, is one of her best friends from school. Person 1103, whom Sue has known for 12 years, is another friend from school. Persons 1102 and 1103 have the same wider circle of friends as Sue. It appears from Sue's interviews that they all socialize together in a big group which comprises as many as 20 people.

The tie strength scores indicate that Sue feels extremely close to all three alters. She gave a 6 to persons 1101 and 1102 and a 5 to person 1103. Her interview account compliments these scores. Sue sources emotional support and companionship from these girls and shares inner thoughts with them. She interacts with them on daily basis and enjoys spending time with them. It appears from her description of these friends that her relationship with each of them is unique in a sense that each girl serves a distinct role in her social life.

Sue's sister suffered from anorexia when she was younger as a result of being bullied on her weight in primary school. Her teenage years were marked by excessive drinking after falling in the company of a wrong crowd subsequently resulting in alcohol induced epileptic seizures. She is a recovering alcoholic since the past 2 years. Sue has supported her sister since younger years and encouraged her to overcome her eating issues and become a happier and a healthier person. She feels she understands her sister like she understands herself.

“Even though there is 5 years between us, it’s more like we are twins...I know her inside out...I know what she hates...I know what she likes...I know what makes her uncomfortable...I know how to deal with her when she is in a bad mood...she is basically me in another person.”

Sue communicates with her sister everyday and sees her in person at least once a week when they spend the day together doing varied activities such as going to the cinema, exercising and talking about their lives. Sue feels that her relationship with her sister is based on mutual trust and understanding where she provides emotional support most of the time such as by helping her mother pick out her sister's food and monitoring her eating. However, she believes that her sister will do the same when and if needed. For example Sue described a time when she was very worried about her father's illness and her sister had provided comfort by explaining things and putting her mind at ease.

Sue's interview account highlights that her sister's health is the most important matter that the two of them often talk about.

“Well obviously eating is one of the important matters and I think that has in a way helped our relationship because I know that I can ask her anything. She knows she can tell me if she is struggling with it and then I'd jump on board and be like ‘ok let's fix it now’ and I know that I can tell her about

anything like if I am having a bad day at college or if it's just stressing about exams, she is always there, I think it works the same way around because I am always there for her and I know that if I need her she is in the background ready to jump"

Person 1102 is a 'complete opposite' of Sue. During the interview Sue described that person 1102 is more outgoing and sporty whereas Sue herself is not. Yet, person 1102 is her "support system" and the first to know about any good or bad things that happen in her life.

"She is my best friend, she is my other half. I can tell her anything under the sun. If I have a problem, she knows it even before I've told her nearly. I couldn't live without her. If anything happened to her I'd be devastated. I think we'd be friends forever because I can't see me coping in life without her"

The intimacy Sue feels for person 1102 is evident from her narration of several instances when she had shared personal issues with her such as her father's illness. Sue feels that person 1102 provided emotional support and comfort to her in return.

"I just remember going into my exam and I left early because I just couldn't focus on it. I went down to the toilet just sat there because I was afraid to go home and because I did not know what awaited me. I could have gone home and my dad could have been passed away. It was just an awful moment. Person 1102 actually left her exam early and followed me down to the toilets and sat beside me. I just cried and cried and didn't even say anything and she didn't even ask why I was crying. She just sat there beside me and eventually I blurted everything out. She gave me a hug and that was all I needed"

Sue derives gratification and fulfilment from her friendship with person 1102 and feels that she has become more open about her feelings after having become friends with her. Person 1102 attends college in Galway and the two make an 'extra effort' to keep in regular contact. They

see each other on weekends and talk every night on phone, their conversations typically lasting an hour.

Sue's relationship with person 1103 is multifaceted. They are childhood friends and have grown up together. Since the start of college, they are also roommates and see each other throughout the week which has strengthened their relationship in many ways. Sue describes her relationship with person 1103 as being based on mutual exchange of social and emotional support. For example, Sue accompanied person 1103 several times on her class nights out at the start of college. She felt that her presence will help her friend socialize with others who otherwise is a very quiet person. They often discuss relationships and family matters with each other. For example, Sue talked to person 1103 about her sister's drinking issues. The fact that they are both insomniacs offers them lots of opportunities to interact frequently and engage in personal conversations.

“I think it's hilarious that we share a room because at 5 o'clock in the morning I'd turn around and she'd be awake and we'd just go out and watch TV and it's just nice to have someone else up at that mad hour. If she can't sleep, I'd get up and if I can't sleep, she'd get up. I think you are so vulnerable when you are up at that hour that you just talk about whatever is bothering you”

Sue also named persons 1102 and 1103 in her 'socializing network'.

From the above description of the functioning of this small group, it is clear that this clique is salient and comprises long standing intimate ties based on reciprocal exchange of social and emotional support. At the same time, the ego acknowledges and identifies with the unique contribution of each tie in her life.

Chapter 8, section 8.3.1.3 will explore how drinking behaviours developed in Sue's network and how are they reinforced by the network members.

7.6.2 The Overlapping Cliques

This typology represents a network structure that comprises multiple cliques connected to each other. In some networks, these multiple cliques were connected by the overlap of common nodes (people) (e.g. Tom's network) whereas in others, people in different cliques happened to know each other (e.g. Sam's network). An important feature of this typology is that, generally, the strongest ties were not confined to a single dominant group as will be noticed in the next typology, 'the group'. In fact, they were found to be scattered in different cliques and each clique was unique in its significance to the participant.

This is the most common structure found in the examined networks. 16 socialization networks, 13 important discussants' networks and 16 overall networks were shaped in this manner. There were 11 participants who had all three networks (socialization, important discussants' and overall) shaped in this manner. 8 of these participants were females and 3 were males.

An example of this typology is Sam's network, a 23 year old male student who had been in DIT for a little over 3 years at the time of the interview. He lives with his parents and belongs to the high drinking cohort. Sam named 13 people as those he shares important matters with and 19 as those he likes socializing or partying with. His overall network comprised 26 people (11 females and 15 males), 6 of whom appeared in both his important discussants' and socialization networks. These have been enclosed in parenthesis in Table 32. The tie strength scores for his network are presented next.

Tie strength score	Alters
6	(61, 62), 63, 64, 65, 66, (611), 618
5	(67, 68), 617
4	(69), 613, 620, 625, 626
3	614, 615, 616, 619, 621, 624
2	610, 622, 623
1	612

Table 32: Tie strength scores for Sam’s network

As has been commented earlier, Sam’s network is an example of a case where the overlap between multiple cliques occurs because some people located in different cliques know each other. The following visualization shows his overall network

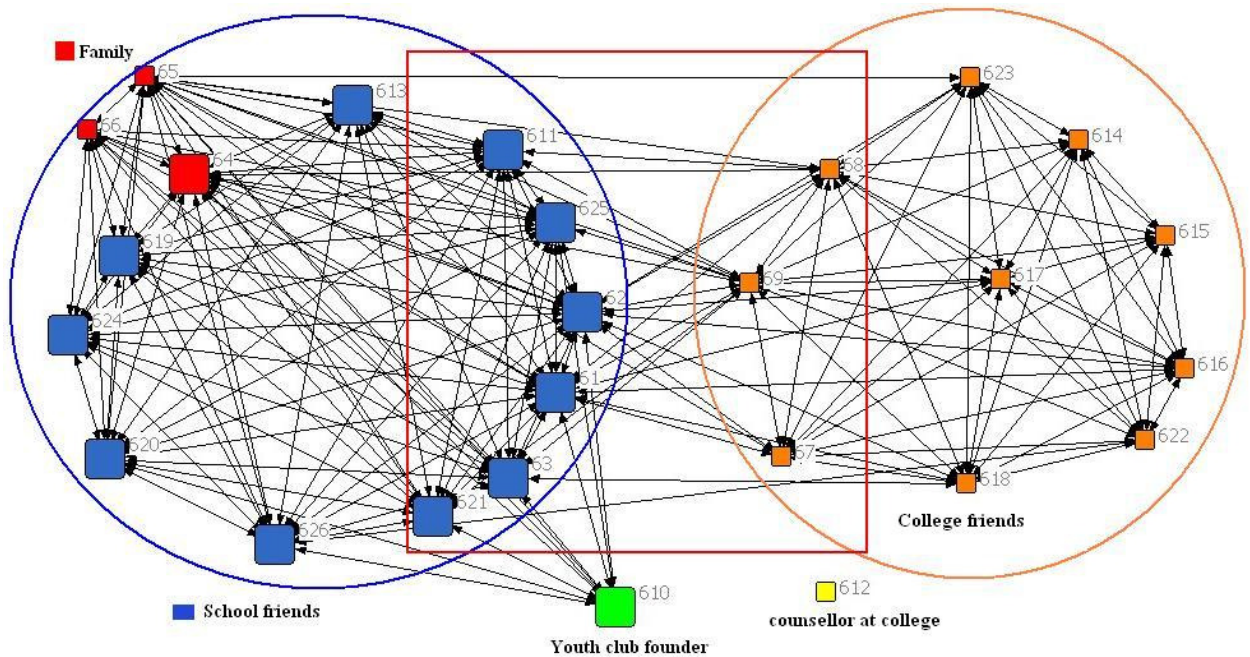


Figure 13: Sam’s overall network: An overlapping clique

The orange nodes encircled in orange, form a clique comprising his college friends who know one another and with whom he interacts on a daily basis. Sam is a final year student and

therefore has known these people for over 3 years. His course in DIT has as many as 30 females and only 6 males which is why Sam feels that the “*lads tends to stick together*”. Among these friends, Sam feels particularly close to three lads; persons 67, 68 and 69 as depicted by Table 32. Sam’s relationship with them is largely based on companionship and exchange of informational support such as talking about college related matters and seeking related advice and opinion. He socializes with them regularly both in and outside college of which nights out and drinking form a central part.

“They’d be the three I’d be most close to and if we ever have a night out or I was having trouble with college, they’d be the first three I’d cal. A lot of things we do would be college based. While we are editing and stuff in college, we find ourselves with a lot of free time so we would hang out and maybe go shopping around town... just sort of hang out and be in each other’s company and then at the same time there’s nights out when we get together. That’s the kind of stuff we do”

Sam also feels quite close to two girls, persons 617 and 618 who are also from college. Person 618 is enrolled in a different course at DIT yet Sam saw her a lot in the first two years of college because she lived in the same area as him. More recently, she has moved to a new area and the interaction between them has decreased. Person 617 is Sam’s classmate. She has gone through some hard times as an adolescent such as dealing with bullying in younger years and being homosexual. Sam admires her for being a ‘*strong character*’ and having gone through some common problems at the start of college, he feels he can relate to her. The two of them have often talked about their deep personal matters and offered encouragement to one another. However, their interaction is limited to college.

“I don’t see her as often as I’d like but we have had quite in deep conversations where we have confided an awful lot into each other and that’s why I feel quite close to her. I was having trouble with

the first year in college and social anxiety as well and she had the same sort of thing. That's something we openly talked about, how we are dealing with it and how it affected us. She confided in me that she was actually on medication for it. And that was very early on in our friendship. We also talked quite openly about even her bullying and my experience with it and about her sexuality. It's not an easy thing to talk about with someone but I always appreciated that she felt that she can do that with me and she wouldn't do that with that many people, that's why I sort of get on well with her"

The nodes encircled in blue form a second clique comprising people Sam has known for 15 or more years. These are his school friends (blue) and his family (red). They all live in the same general area in close proximity of each other. People with whom Sam shares the strongest ties are embedded in this clique as is indicated by the tie strength scores in Table 32. Of this clique, persons 61, 62, 63, and 613 form what Sam describes as his “*tight circle*” of friends whom he has known since early teens and with whom he interacts on daily basis. These friends are also a source of emotional and instrumental support for him. Sam recalled several occasions during the interview when he had turned to them for opinion and advice on issues important to him such as relationships, academics and career related matters.

For example, he described person 61 whom he has known for 15 years as a confidant and “*the one person he'd feel comfortable confiding in*” on anything.

“If I was to say to him that I am really struggling with college or something of the sort, he'd be the first to help me and actually that reminds me, when I was doing my dissertation I was stressed time wise to get stuff typed. He stayed up till 4 in the morning and he did it for me. So...that's the kind of character he is”

Similarly, when Sam failed the first year in college, person 62 who also goes to DIT (different campus) was the first to know and offer advice. Lately, Sam has started accompanying person

62 to the gym where Sam helps him in his new fitness routine. Sam feels that his company makes the gym atmosphere less intimidating for his friend.

Person 63 is a girl who Sam has been friends with for 15 years and with whom he also had a relationship for two years. They are still good friends and Sam feels he misses her when he is not able to talk to her. Over the years, he has discussed personal issues with her and feels grateful for her support.

“We were in a relationship for 2 and a half years so basically anything that I went through, I disclosed to her, it was in the middle of this relationship that I went through this social anxiety thing and I was in pretty deep to be honest. I was having trouble with my folks about it because I was kind of ashamed of the fact that I was almost afraid of my own shadow and she was the first person that I talked to about that”

Person 613 is also a girl with whom Sam has been friends for 15 years. Sam described that he seeks her advice and opinion whenever he has to shop for presents. More recently, he has also begun to give her driving lessons. It appears from his interview that Sam’s relationship with this tight group of friends is based on years of companionship, mutual trust, shared activities and being able to confide in one another.

The other people in this clique include persons 611, 619, 620, 621 and 624 whom Sam described as the ‘*jock group*’ that he grew up with. These lads were always heavily involved in sports during school years and are still on Sam’s foot ball team. Sam’s friendship with them is based on having grown up together and sharing childhood memories. Much of the socialization with these friends is drink related as will be described in more detail in chapter 8, section 8.3.1.1. Sam also plays foot ball with them 3-4 times a week. Among them Sam feels closest to

person 611 to whom he assigned a 6 on 'tie strength' scores. Sam seeks his advice on sports related matters and values his opinion.

“I was having doubts about playing for a certain Gaelic football team and person 611 was the first person that I confided in. It’s an honour to play for this team and I was feeling two ways about it. He just said , ‘Sam, if I could play for that team and I didn’t, I’d look back in 20 years and think what else was I doing that was so important’. It has stuck with me and it’s something that I am going to pursue because of his advice”

Sam is part of a youth club where he works as a volunteer. The youth club holds a special place in his social life and he referred to it several times during the interview. The nodes which are larger in size represent the people who are or have been part of the youth club at some stage. This includes most of Sam’s school friends as well as his brother. It is apparent from the visualization that the youth club is central to his interaction with most people from school. He describes it as a ‘cult’ which most of his school friends have been part of at some stage.

“It’s a difficult thing to explain to people because I am sure everybody feels very special about a youth club they are involved in but our particular one was has kind of been a family. And it’s where I forged as you can see my longest standing relationships and friendships”

This older clique also includes Sam’s family; his parents and a younger brother. He described his parents as very welcoming and considers their support in his life as “constant”. The encouragement, emotional support and backing that they provide, means a lot to him. Sam for example described how his parents supported him when he wasn’t managing very well in academics at the start of college and how his father encouraged his love of sports from a very young age.

“When I was younger, I wanted to play foot ball but I was too young to play for a team, so dad went down to a club and started a team for people my age and he managed to find 10 kids from 6 to 7 and he’d coach them. Every week he’d organize parents and get them to matches, lined the pitches, put up the flags, put up the nets and stuff and he coached me for 10-15 years and then he coached my brother”

Sam also feels quite close to his brother with whom he shares several activities such as playing football on the same team and being involved in voluntary work in the same youth club. Sam’s brother seems to know a lot of Sam’s friends through the youth club.

In addition, there are two more people in Sam’s network. The green node is the person who founded the youth club and whom Sam holds in high esteem as he initiated him into youth work. The yellow node is a counsellor at college who helped Sam deal with some social anxiety issues at the start of college. Sam still goes to her for counselling from time to time.

The nodes boxed in red show the overlap between the two cliques from college and school. Several people from the two cliques know each other. For example, person 69 from college lives in the same area as Sam and has known him for 10 years. He knows many of his school friends who also live in the vicinity. Likewise, two of his school friends namely persons 61 and 62 are ex and current DIT students respectively (though at a different campus than Sam) and know his friends from college. Because of these friendships across the two cliques, the two groups (college friends and school friends) often get to interact with each other in night clubs and social events such as birthdays. However, it appears from the interview that Sam also socializes with these two groups separately and sources different types of support from them. Though he feels very close to some college friends as described earlier, Sam only discusses college related matters with most of them and much of the socialization is limited to college

based activities and class nights out. The older clique of school friends and family on the other hand forms his *'support system'* where he feels comfortable confiding about personal matters. He socializes with these friends in several ways such as playing football, going to the gym, playing computer games in each others' houses and activities based around the youth club. Thus while he engages in drink related activities with both his college friends and school friends who serve unique purposes in Sam's social circle, it is clear that the most salient ties are embedded in the cohesive group of older friends outside college.

The discussion of Sam's network will be extended in chapter 8, section 8.3.1.1 to assess how drinking norms developed and sustained in his network.

Another example of this typology is the network of Meg, a 19 year old moderate drinking female who has been a student at DIT for 2 years and lives with her parents. Meg named 19 people in all of whom 4 were males and 15 were females. Her important discussants' and socialization networks comprised 12 people each. 8 people overlapped between her important discussants' and socialization networks (enclosed in parenthesis in Table 33). The tie strength scores for Meg's network are presented below.

Tie strength score	Alters
6	(1304) , 1308
5	1301, (1302, 1303, 1305) , 1312
4	(1306) , 1307, (1309, 1310, 1311)
3	1313, 1314, 1315, 1316, 1317, 1318
2	1319

Table 33: Tie strength scores for Meg's network

Meg's overall network is shown in the following visualization

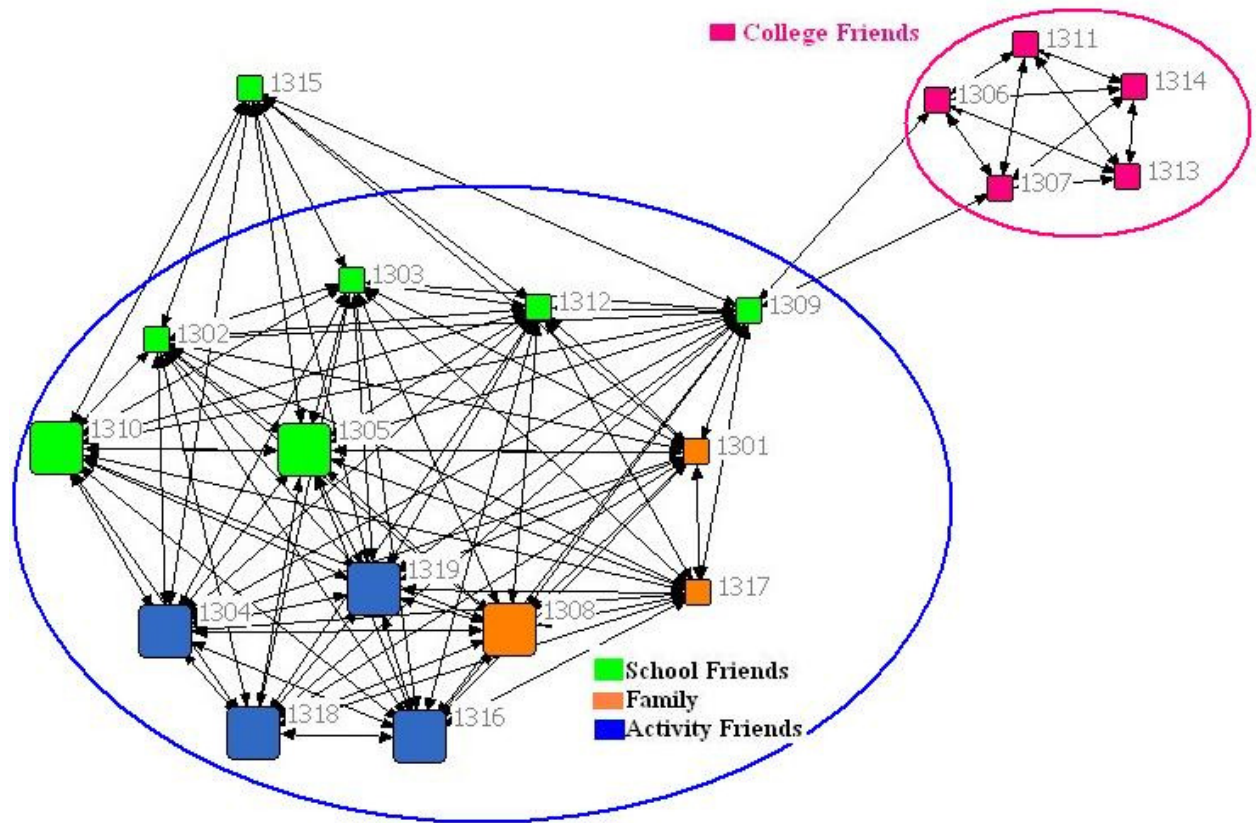


Figure 14: Meg's overall network: An overlapping clique

The visualization shows two distinct cliques. The nodes encircled in pink represent 5 class mates from college, all girls, whom Meg has known for 2 years and with whom she interacts daily. They spend a lot of time in each other's company in college and sometimes socialize outside college settings such as on class nights out and in the cinema. Among these girls, Meg feels closest to persons 1306, 1307 and 1311 whom Meg named in both her important discussants' and socialization networks. During the interview, it emerged that like Meg, these three girls have boyfriends and Meg feels she can talk to them openly about '*relationships*' and '*boy friend troubles*'. She described a time when her boyfriend (person 1304) had broken up with her for a while and she had discussed it with these friends who were very supportive and

offered encouragement in return. Meg's relationship with her college friends is largely based on social companionship.

The nodes encircled in blue represent the people who Meg knows from outside college. This clique includes her school friends (green nodes), some friends she has made through her involvement in a voluntary organization (blue nodes and large nodes) and some family members (orange nodes). These people live or have lived in the same general area as Meg as a result of which they all know each other and interact frequently.

There are 6 friends from school in this clique, all females with whom Meg communicates and socializes regularly. She takes a holiday with these friends and person 1315 (who lies outside the clique) every year when they all go down to a holiday home that Meg's family owns in the country side and spend time together doing varied activities. Among these girls, Meg feels closest to person 1302, who she has known for 15 years and persons 1303, 1305 and 1312 whom she has known for 7 years. She interacts with them frequently as a group as well as individually. For example person 1302 though lives in another town, works in the same company as Meg as a result of which they get to see each other a lot in relation to work. Person 1305 works for the same voluntary organization as Meg and they interact a lot during trainings and related events. Person 1312, who Meg described as the first friend she made in secondary school currently resides outside Ireland in relation to her studies, yet Meg keeps in touch with her regularly and they write letters to each other. Meg described an occasion when she felt overwhelmed because person 1312 came home especially for Meg's surprise birthday party. During the interview, Meg described that she feels she can discuss most matters with these friends and that she relies on them for advice on '*relationships*' and '*family issues*'. Persons

1309 and 1310 are also Meg's school friends who she has known for 9 and 4 years respectively. They both have boyfriends and Meg feels they are good to talk to about '*boyfriend related issues*'. She also feels she can discuss family related issues with person 1310 who has some family problems herself which she often shares with Meg.

All male friends in her network come from the voluntary organization that she is involved in. Of these lads, she feels closest to person 1304 who has been her boyfriend for a little over 2 years. Meg interacts with him frequently doing varied activities such as going to the gym, sitting in and watching TV, going to the cinema and socializing on nights out and on civil defence related activities. Meg feels she can discuss anything with him and values his advice. She described how he had organized a surprise birthday party for her and made sure all her friends were there. Person 1316 is a friend of Meg's brother whom she has known since 10 years. He is also in a relationship with Meg's school friend (person 1309). During the interview Meg described him as an '*older brother*'. Besides the voluntary work, they often play football together. The other two lads (persons 1318 and 1319) are friends she interacts with at the voluntary organization and with whom she also socializes in group settings. Though, she does not feel as close to them as some of the other friends in the clique, Meg described them as '*good friends*', whom she values and trusts. She also described how their lives were complicated by family related issues and how they deal with it suggesting that these friends share personal matters with her.

Meg belongs to a big family comprising her parents and 8 siblings. Of her family, she mentioned only her mother (person 1302) and two sisters (persons 1308 and 1317). Meg described during the interview that she feels very close to her mother with whom she can talk

about anything. Person 1308 is her sister who is 18 years old and whom Meg described as a 'loner' and someone who *'hates drinking and crowds'*. She resides out of town in relation to her studies but Meg talks to her several times during the week. Meg socializes with her sister at trainings related to her voluntary organization as she is also a member. Person 1317 is Meg's older sister who works out of country. Meg does not feel very close to her as she has lived away from home for a very long time. They communicate once in a while via email.

Unlike Sam's network described earlier, Meg's friends from college do not know most of her friends from outside college except person 1309 who knows two of her college friends (persons 1306 and 1307). As a result, there is very little interaction between the two cliques. Meg socializes with them separately and it appears from the interview that her strongest and most intimate ties are those she has known since many years generally embedded in the bigger clique outside college.

It is clear from the functioning of this network that of all network members, Meg feels the closest with her group of female friends from school and her boyfriend. Her relationship with these people is based on frequent interaction, reciprocal exchange of support, mutual confiding and shared activities.

Chapter 8, section 8.3.1.2 will describe how drinking behaviours developed in Meg's network and how these norms are reinforced by the network members.

7.6.3 The Group

This typology represents a network which comprises a predominant '*group*' of people in a participant's social life. The '*group*' was found to provide social companionship and support

and came across as particularly salient in the focal individual's life. In networks of this type, the 'group' generally featured a whole entity where single ties were less important than the group itself. However, within the group, sub groups sometimes arose from shared interests as will be discussed later with examples. In a network of this type, the strongest ties were usually found to be embedded in the 'group'. The 'group' generally existed outside college settings and comprised older friends, family or a combination of both. In some cases, the 'group' also included people who were comparatively recent friends yet, had become very close to the participants and were well integrated in the wider network.

An important distinction between the 'group' and 'overlapping cliques' is that while the latter comprises multiple cliques (where everyone knows everyone), the 'group' is dense where most people knew most others but it does not necessarily have to be a clique - a point that will be clarified with examples shortly.

This is the second most common typology noted in the data set. 6 important discussants', socialization and overall networks follow this typology. There were 5 participants (3 females and 2 males), who had all three networks (important discussants', socialization and overall) shaped in this manner.

An example of this typology is the network of Lisa, who is a 20 year old female doing a business degree in DIT since three years. She lives with her parents and belongs to the high drinking cohort. Lisa named 24 (14 females and 10 males) people in all. The tie strength scores for her network are illustrated in the following table. The people who appeared in both her important discussants' and socialization networks are enclosed in parenthesis for identification

Tie Strength scores	Alters
6	(2601, 2602, 2603, 2604, 2605), 2606, 2607, 2608, 2618
5	2611, 2617, 2619
4	2610, (2612, 2613), 2620
3	2614, 2616, 2621, 2623
2	2615, 2622, 2624
1	2609

Table 34: Tie strength scores for Lisa’s network

The following visualization represents her total network

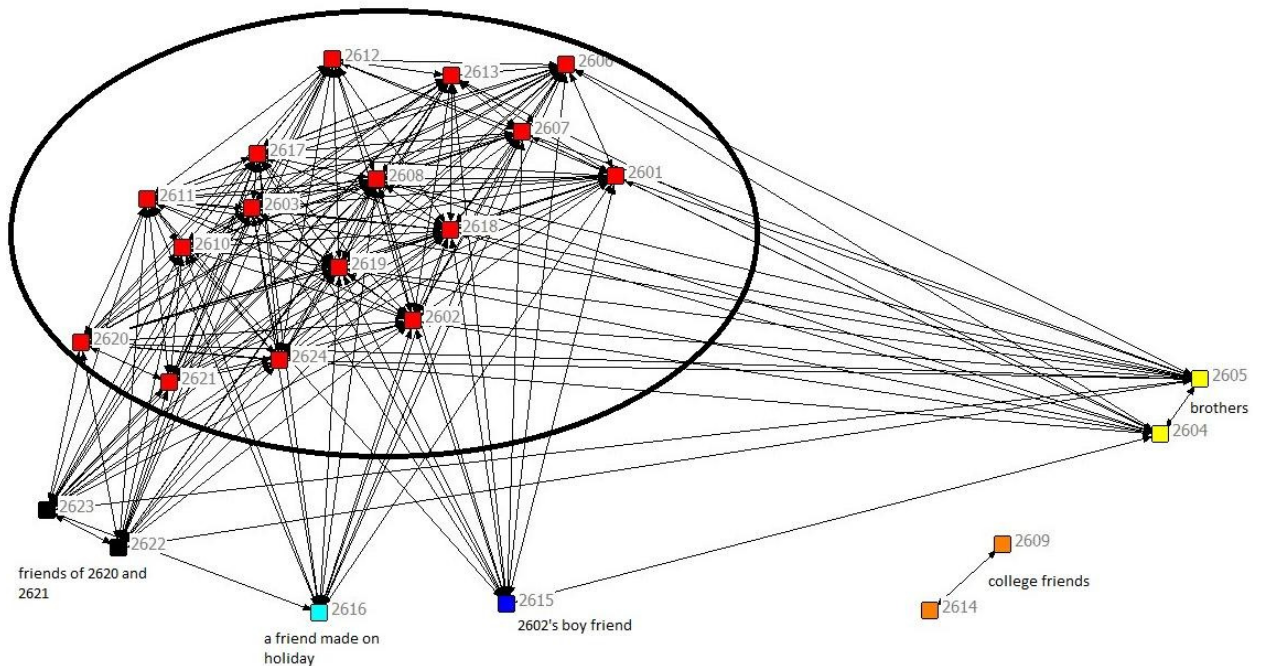


Figure 15: Lisa’s overall network: A ‘group’

The ‘group’ in this network is comprised by 16 friends who Lisa has known from school and a friend who lives close to her. These people are represented by the red nodes which have been encircled in black for emphasis in the above visualization. The ‘group’ is predominantly female. There are only 3 male friends. Also, as commented earlier, the ‘group’ does not

necessarily have to be a clique (where everyone knows everyone). In this example the ‘group’ is very dense but not everyone is connected to everyone. For example, persons 2620 and 2624 do not know person 2607. Similarly, person 2621 does not know persons 2607 and 2606. Yet, these friends are part of the ‘group’ because they know most of the people in it.

Lisa has known some of these friends longer than the others. Generally, the duration of friendship in this ‘group’ ranges between 7 and 14 years. There is variation in the extent of closeness that Lisa feels towards her friends in the group. There is a sub group of 5 girls within the main group that she described as her “*tight group of girls*” and with whom she feels the closest.

“I have a group of girlfriends and that would include persons 2601, 2602 and 2606, 2607 and 2608. We all live in the same area so we have known each other since primary school and I would be really close to them. Person 2602 is my best friend and persons 2601 and 2608 are best friends with each other while persons 2606 and 2607 are also best friends with each other. We meet up like all the time, the six of us”

Their relationship is strengthened by years of companionship, shared activities and reciprocal exchange of emotional support. Their families also know each other. 4 of these girls go to Trinity which is located close to DIT. Lisa interacts with them several times a week during her college breaks and at home. They all hang out together, go on holidays together and socialize by engaging in both drink and non drink related activities. Lisa recalled several of these holidays during the interview and described how much she and the girls enjoyed them. At the time of the interview, the girls were planning to go to Australia for a year. Lisa feels that these friends ‘*know everything about her*’ and that she wouldn’t have ‘*any problem talking to them*

about anything'. Person 2601 is Lisa's neighbour and the two have known each other since they were 8 years old. She goes to Trinity and knows her school friends as most of them also go to Trinity.

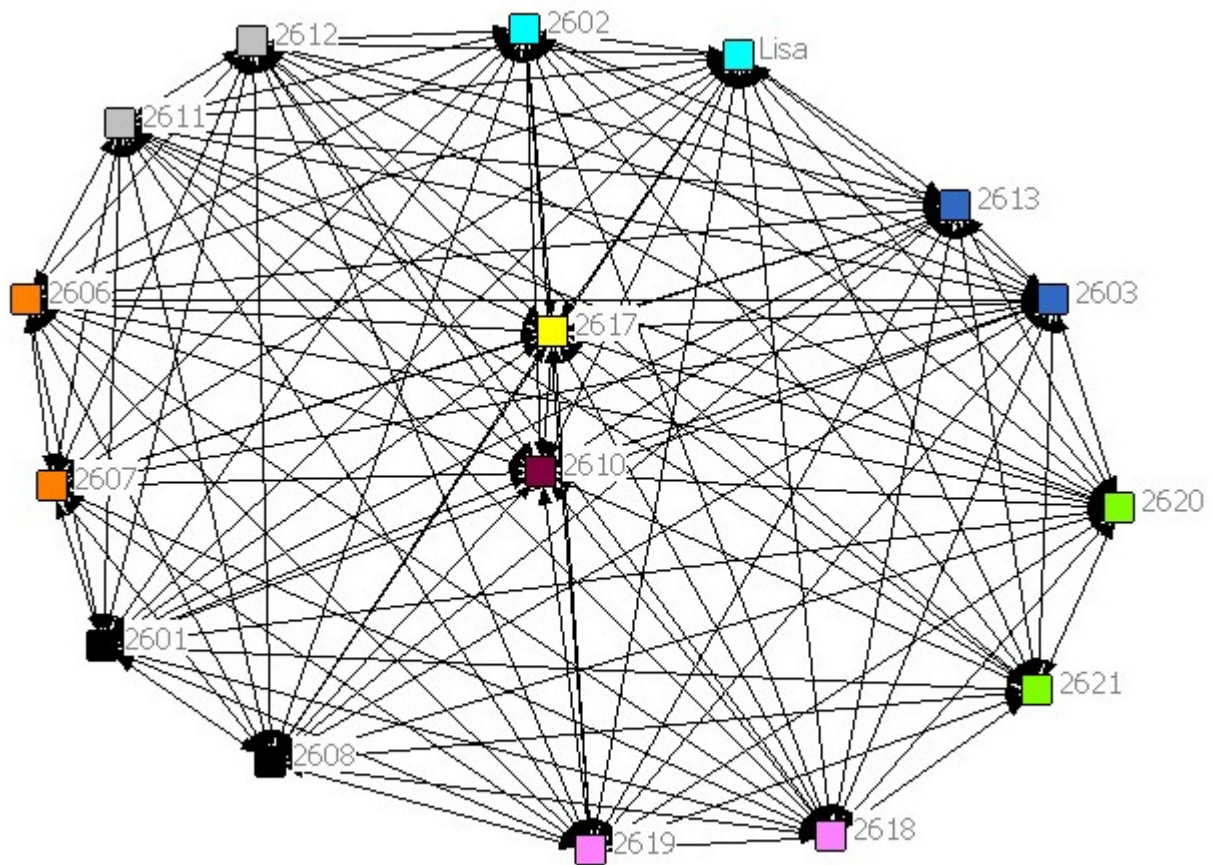
During the interview, Lisa spoke about her 6th year holiday across Europe in celebration of clearing her leaving certificate. Many friends from the 'group' such as persons 2602, 2603, 2610, 2617, 2618, 2619, 2621 and 2624 accompanied her on the trip which lasted a month. Lisa described that during this time she and her friends travelled together, stayed in hostels, met new people, enjoyed nights out and did a lot of sightseeing. Lisa feels that she has gotten closer to the 'group' after the holiday because she interacted a lot with these friends on the trip and feels that she knows them better now. For example she described how her relationships with some of the friends such as persons 2603 and 2617 strengthened after the trip. Lisa gave a 5 to these friends on tie-strength scores.

"I knew person 2603 before but not as closely as I do now because there were only 6 of us like the whole time (on the holiday). Person 2602 who is my best friend left after two and a half weeks to go to the (holy) walk in Spain so I got really close to person 2603 whose best friend was in another country at the time. We got really close because our best friends weren't there. Similarly, I got really close to person 2617 because she was also in the group that I went on holiday with and I didn't know her that well before like I obviously knew her I was friends with her but afterwards, when I came back, I was really close with her"

The three males in the 'group' (persons 2620, 2621 and 2624) are also Lisa's school friends. Of them, she feels closest to person 2620, whom she described as her '*oldest guy friend*' and who she has known since she was 3 years old. He does not live in the same area any more

however, Lisa still stays in contact with him and they often meet up in their free time and at 'group' get-togethers.

Lisa described that several people in the 'group' were best friends with one another. This also explains why the 'group' is very closely knit. The following visualization shows an enlarged image of the 'group' where people who are best friends with each other are represented in similar colours.



Similar colors indicate that nodes are best friends with each other

Figure 16: Enlarged Image of the 'group' in Lisa's network

Outside of the group, there are two recent college friends who Lisa has known for less than a year. She only socializes with them in college or at class nights out, and discusses college related matters with them. She does not however share personal matters with them. These college friends also do not know anyone from the 'group'.

Lisa feels very close to her two brothers namely persons 2604 and 2605 and that's the only family that she named.

"I don't know as far as brothers and sisters go I'd say I am quite close to them. Recently, I would go out with person 2604 and his friends or like I would see them out you know and I would hang around with them or I'd go to lunch with him and his girlfriend"

In addition, there are some friends outside the group that she knows through people in the group. They sometimes come out with the group and spend time together. Lisa only socializes with them in the 'group' rather than on her own.

Lisa's interview account reflects that the 'group' is predominantly salient to her in several ways. Her strongest friendships are embedded in the 'group'. She confides in these friends and values their opinion. Not only does the 'group' provide her companionship and support, it also provides her with fulfillment as she does not feel the need to form new associations or introduce her recent contacts to the group. For example, she has been in college for three years and yet she didn't mention anyone from college that she has known for longer than a year. Also, her college friends do not know anyone in her wider network nor does Lisa share deep personal issues with them.

Chapter 8, section 8.3.2.1 will examine how drinking behaviours developed within the 'group' and how do members reinforce these norms.

7.6.4 The Core/Periphery

This typology represents a network with a highly dense core (density = 1) and less dense peripheries that interact with the core to a greater or lesser extent (Borgatti and Everett, 2000). In simple words, a core characterizes a group of people where everyone knows everyone (hence density = 1), while the peripheries are connected to the core but not to each other. Following the classification of (Bellotti, 2008), the core is conceptualized as a very cohesive subgroup that provides multiplex²⁴ support and whose ties were older than the others. The peripheries on the other hand are generally less dense and represent ties that are more recent and weaker than those in the core. Also these ties are largely dependent on the context in which they were formed and sustain. Two participants, Linda and Gary, had their socialization and overall networks based on this model.

Gary is a heavy drinking, 23 year old male, studying Art in DIT since 4 years. He lives in a shared accommodation in Dublin. Gary named 11 people in all (3 females and 9 males). His socialization network comprised 6 people all of whom also appeared in his important discussants' network which comprised 11 people.

The tie strength scores for Gary's network are tabulated below with the nodes enclosed in parenthesis representing people who appear in both the important discussants' and socialization networks.

²⁴ Multiplexity in network science means an overlap of roles, exchanges or affiliations Wasserman, S. and K. Faust (2007). Social Network Analysis: Methods and Applications, Cambridge Univ Pr..

Tie strength scores	Alters
6	(2301, 2304), 2307
5	(2308, 2309)
4	(2310)
3	(2302), 2312
2	2306, 2311
1	2303, 2305

Table 35: Tie strength scores for Gary’s network

The following visualization (Figure 17) shows his overall network

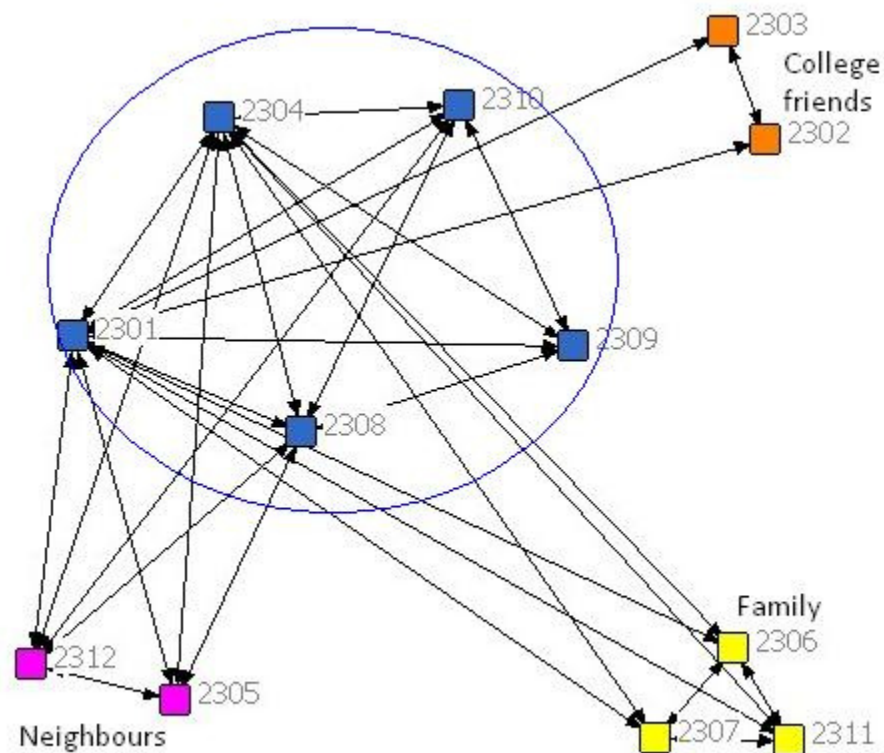


Figure 17: Gary’s overall network: A core/periphery

Here we find a cohesive core of friends encircled in blue, which Gary described as his “*close group of friends*” and less dense peripheries with whom he interacts in a certain context. The

core comprises 5 lads who he knows in contexts outside of college and who overlap between the important discussants' and the socialization networks. Gary interacts with them several times a week. Among them he describes persons 2301 and 2304 as his best friends. These are Gary's longest standing friends who he has known for over a decade and with whom he shares inner thoughts and personal matters. Gary shares his love for American foot ball with person 2304 who is a friend who he knows from school. Gary does not get to see him as often as the others because person 2304 works full time. He also has a steady girl friend (person 2312) since 5 years with whom he spends most of his time. Yet, Gary confides in him and person 2301 and relies on them for an honest and candid advice on matters that are important to him and in turn values their opinion.

"I am planning to do masters next year and it's coming down to the time when I have to start applying where I want to go and I met person 2304 last week and we were able to discuss. He gave me his outline, what he thinks I'd be good at. If I'd go that I want to do law or be a doctor, he'd go 'I have known you, you don't like those kind of things, when it gets down to it you are very good with people and you are very good with business but you wouldn't like to sit and do 4 years and be a doctor'. I can only imagine himself and person 2301 to be able to say it to me...to tell me the truth rather than other people who'd just fill my head like my mum or the guys that I don't know as well like persons 2302 and 2303. These two lads (persons 2301 and 2304) will tell me what I need to hear rather than what I want to hear"

Person 2301 is Gary's childhood friend with whom he has grown up. Although they went to different schools, the fact that they were going to the same college brought them closer and in the past five years they have been "inseparable". Their relationship is strengthened by several shared activities, for example, person 2301 lives close to Gary, plays on the same rugby team,

goes to the same college (DIT) and the same gym and their moms work together. They interact daily and go on holidays together every summer without an exception. Gary described during the interview that he feels he can confide in person 2301 on any matter from college to relationships and family. Their relationship of being able to confide in one another and look out for each other is mutual and reciprocal. They also socialize in the same extended group of friends most of whom are person 2301's school friends including the remaining 3 members of the core namely persons 2308, 2309 and 2310.

Gary always hangs out with persons 2301, 2308, 2309 and 2310 together. The relationship that he shares with these lads as a group is based on shared activities as much of the socialization revolves around football, gym and going out. He also shares an interest in music, politics and foreign affairs with person 2310. They often play music together or discuss current affairs at length. Gary sees the lads at least once a week if not more.

The peripheries comprise two friends from college (persons 2302 and 2303), two neighbours (2305 and 2312) and 3 family members (persons 2306, 2307 and 2311). The relationship with the peripheral friends is largely dependent on the context. The college friends for example provide informational support in college related work. Gary only sees them in college or on college nights out, and discusses course related matters with them. He met these friends on Erasmus in Spain and shared an apartment with them. Person 2301 came over to visit him and that's how he also knows Gary's college friends. Among college friends, Gary feels closer to person 2302 because he got to spend more time with him compared to person 2303, who has a girlfriend with whom he spends most of his time. Person 2302 is the only person from outside the core who appears in both the important discussants' and socialization networks.

Of neighbours, person 2312 is person 2304's girlfriend and Gary's closest female friend. She has a large group of friends and Gary often comes across her on nights out where they usually chat briefly. Person 2305 is a girl he has known since childhood. As children they always hung out together and Gary also had a relationship with her for a short while. Now, they are not as close and mostly interact through social networking websites. While their relationship has changed in terms of support and frequency of contact, Gary values her and mentioned her as one of the people he likes socializing with. This agrees with Bellotti (2008) in that friendship cannot always be reduced to the kind of support it provides. The relationship history must be taken into consideration.

"She is just another neighbour I've had for a long time and someone I can talk to if I have a problem. We wouldn't be that close. She is just one of those people that you don't see that often but whatever you do it's like nothing has change. As in with some people if I haven't seen them in a while, you grow apart. But with her, it's like you've seen her yesterday even if it's been two months. Nothing changed"

Among his family members, Gary feels closest to his younger brother who is 19 years old. They spend a lot of time together at home doing various things. Gary describes his family as very sporty and he and his brother often support each other's teams in foot ball and rugby. His relationship with his family members largely revolves around discussing issues as a family and talking about fitness and sports.

It is apparent from the tie strength scores and Gary's description of his network during the interview that the people who are most salient to him lie outside college settings and embedded in a very cohesive core. All of them also appear in both his important discussants' and

socialization networks. Chapter 8, section 8.3.3.1 will explore how drink related norms developed in Gary’s network and how are they socially reinforced by the members.

Another example of this typology is the network of Linda, a heavy drinking 19 year old female who lives with her parents and has been studying business and management in DIT since 3 years. Linda named 9 people as those she shares important matters with and 17 as those she likes partying or socializing with. Over all, her network comprised 20 people 6 of whom appeared in both the important discussants’ and socialization networks. From gender perspective, her network comprised 8 females and 12 males.

The tie strength scores for Linda’s network are tabulated below with the overlapping nodes in parenthesis.

Tie strength scores	Alters
6	81, 82, (83, 85)
5	(84, 86, 87) , 89
4	(88) , 812, 813, 816, 819
3	810, 811, 814, 815, 818, 820
2	817

Table 36: Tie strength scores for Linda's network

The following visualization (Figure 18) shows her overall network.

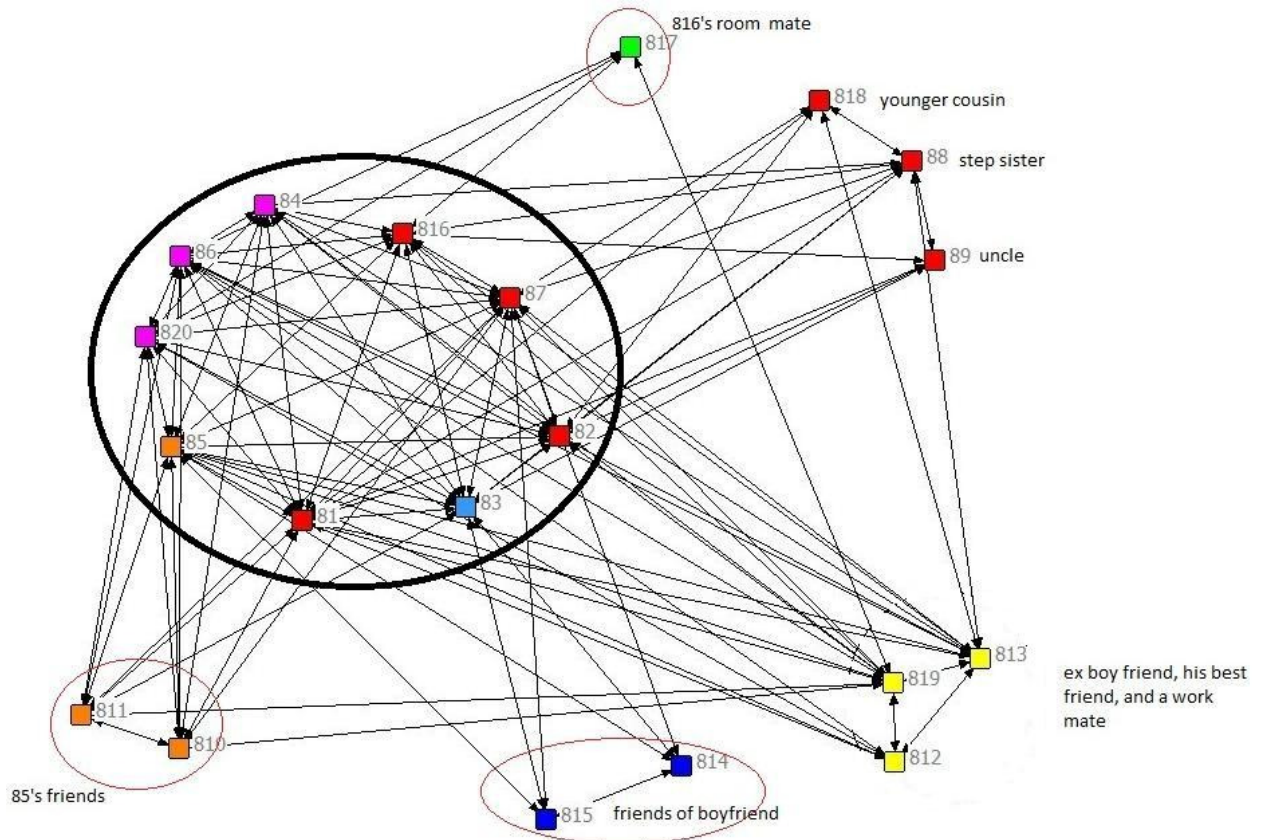


Figure 18: Linda's overall network: A core/periphery

A very cohesive core comprising Linda's family (red: parents and two cousins), school friends (pink), boy friend (blue) who she met on a pub crawl and a work mate (orange) has been encircled in thick black.

Linda feels extremely close to her mother (person 81) and step father (person 82) whom she regards as her *'real dad'*. She described that her parents are *"really supportive"* and that she shares inner thoughts and personal issues with them and values their advice and opinion. For example, during the interview she described a time in secondary school when she had felt that she had no friends. Linda feels that her step-dad let her *'pour her heart out at the time'* and offered emotional support and encouragement to cheer her up. She also explained how her

mother takes care of her despite ill health. She described a time when she was passing through a depressive phase in college and nearly decided on dropping out. Linda feels that her mother's support at the time helped her make the right decision which she appreciates.

“I just wasn't happy at that time in college and I was regretting my decision of going to college and mom just helped me get through it. It's very hard to describe... I'd just come home and I'd be upset and I'd be crying all the time and she would just come up to my room and talk for hours and even though I didn't want anybody around me, she'd just be there comforting me. She was very supportive but at the same time she was like 'just think about it, it's only for this time like it will pass'. I only had a tunnel vision at the time and all I could see was the worst but she showed me the light at the end of the tunnel”

Linda's two cousins (persons 87 and 816) are almost like sisters to her as she grew up with them doing various activities. Of these, she feels closer to person 87 with whom she socializes frequently in both drink and non drink related ways. She also helped person 816 settle in Dublin by introducing her to many new people that helped her get along. Of school friends, Linda has known person 84 the longest. Her relationship with person 84 is nurtured by several years of companionship and mutual trust. They grew up together, went to the same school and shared many activities as teenagers. Although their schedules have become busier because of college work, they still make a conscious effort to spend time with each other.

“I have known her since I was 4 years old. We met on the first day of school and have done everything together, every sport, and every dance class. Because we are so busy now, we try to have a girls' night at least once a month. We'd share it so one month we'd go to her house and the next month it'd be my house. We spend around 4 hours getting ready (chuckles) and drinking before we go out and then we just stay in each other's houses and talk the whole night”

Person 83 is Linda's new boy friend who she met on a pub crawl a few months ago. He is 26 years old and Linda feels extremely close to him. She socializes with him several times a week in both drink and non drink related ways and confides in him on personal matters such as those related to family and career. She also interacts with person 83's wider group of friends.

Person 85 is a female friend Linda made at work. She describes person 85 as her *'party buddy'*. Though person 85 does not drink, Linda goes dancing with her regularly. They have gone on two holidays together in the three years of knowing each other and discuss almost everything with one another. Person 85 also introduced Linda to some of her own close friends.

Linda's description of the core relationships reflects the strong bond she shares with these people. However, sometimes, conflicts arise in these relationships, yet the longstanding nature of these ties keeps the core intact. For example Linda described a time when she believed that her cousin (person 87) was deliberately creating a wedge between Linda and her step sister (person 88) which she and her sister realized and sorted out. She also recalled an instance when she caught her cousin (person 816) kissing her ex-boyfriend (person 813). Linda described the incident as being "*stabbed in the back*", but explained that she didn't confront her cousin for the sake of their mothers who are sisters.

The peripheral friends are also encircled in the visualization. These are the people Linda came to befriend through people in the core. Her relationship with these friends is based on specific contexts. For example, the orange nodes are friends of person 85 with whom she works. She met these friends on one of the holidays she took with person 85. She now socializes with them on nights out. Whenever she goes out with person 85, they'd probably be there too. She interacts with them once a week when their schedules match.

The blue nodes are friends of her boy friend (person 83). She met them through nights out and much of her socialization with them is drink related. She interacts with them in group settings and her boy friend is usually around as well. She wouldn't see these friends unless there is a night out or a house party which would be about once a week.

The green node (person 817) is her cousin's (person 816) roommate. Linda has only socialized with him a few times at his apartment and described that she gets on well with him.

In addition to the peripheral friends, we see a clique outside the core. These are the people she came to know through work (yellow). It includes her ex boy friend (person 813), whom she described as '*a goth*'. He is also Linda's work mate and though they are not in a relationship any more, he remains a good friend. Linda socializes with him at work and on nights out. Person 812 is her ex's (person 813) best friend and also works with Linda. Linda describes him as a good friend who she sees on nights out as well as individually. She described that they sometimes go for drives and often talk about their relationships as he also has a girlfriend. They don't see each other a lot but whenever they do (once a month), Linda loves to party with him. Person 819 is a work mate who also goes to DIT. He is a year ahead of Linda in college and sometimes helps her with college work. She socializes with him at work as well as on nights out. Linda spends half an hour with him every day after work while they wait for their respective buses.

Some family is also visible outside the core. These are her step sister (person 88), a younger cousin (person 818) and her uncle (person 89). Linda does not see them a lot. Her step sister is married and has a child. When they were younger they were not very close but Linda feels that her relationship with her sister has improved and they make an effort to get along with each

other for their parents' sake. Her uncle is doing up scaling in DIT because of which she feels she can discuss college related issues with him. He is married and has his own family. Linda only socializes with him on family occasions. She described that when she was younger there were a lot of family occasions to go to such as weekly dinners and Christmas at the great aunt's home however, now it is not as frequent. Then there is a younger cousin (person 818) who she was much closer to in younger years. Now they have drifted apart mainly because of separate social circles. They go out together very rarely.

The core in general is salient to Linda in several ways. First, Linda feels very close to most of these people which is reflected by the tie strength scores and her interview account. Second, these relationships are based on shared activities, regular interaction (though not as a group) and mutual exchange of emotional and social support. Third, 5 of the 6 people that were named in both name generators happen to be part of the core (persons 83-88). And last, people in the core share long standing relationships with Linda. The exceptions are her boy friend (person 83) whom she has known only a few months and a work mate (person 85) who she has known for two and a half years. However, both are extremely close friends of Linda and appeared in both name generators.

Chapter 8, section 8.3.3.2, will explore what kind of drinking behaviours and attitudes are prevalent in the core and how are these norms transmitted.

7.6.5 The Contextualized Network

The last typology represents a network structure where a participant is connected to independent sub groups or nodes specialized in a specific context. An important feature of this

typology which distinguishes it from those described earlier is that in a contextualized network, various groups and individuals that a participant is connected to are not connected to each other except through that participant.

There was only one person whose overall network followed this structure. Ruth is a 22 year old female who has been studying business and management in DIT for 4 years. She lives with her parents in Dublin and happens to be the only person in the sample who belonged to the low drinking cohort. She named 11 people in all, 8 females and 3 males. She discusses important matters with all 11 and socializes with 5 – all of whom are females.

The tie strength scores for Ruth’s network are illustrated next with the nodes enclosed in parenthesis representing overlapping nodes between the important discussants’ and socializing networks.

Tie strength score	Alters
6	71, (72) , 73, (74, 75) , 76, (710, 711)
4	77, 78, 79

Table 37: Tie strength scores for Ruth’s network

The following visualization (Figure 19) represents her overall network.

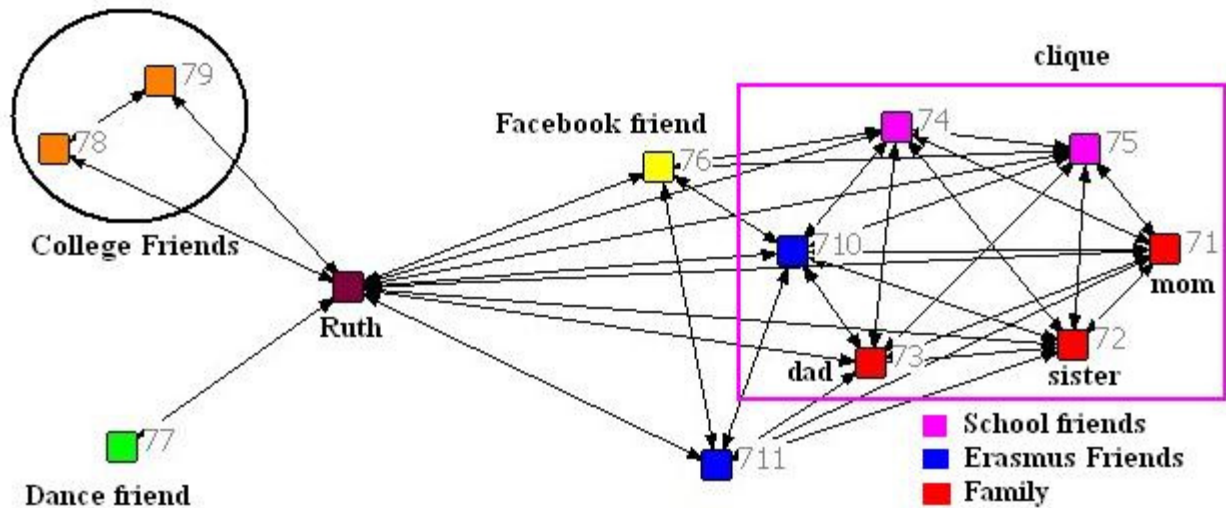


Figure 19: Ruth's overall network: A contextualized network

As is apparent from the visualization there are three main components of this network which are not connected to one another except through Ruth. These are the orange nodes, the green node and the cluster of nodes visible in the right hand side of the above visualization.

The orange nodes, a male and a female, are Ruth's class mates in college (Persons 78 and 79). She met them in the first year through group projects in class. What is interesting is that although Ruth has known these friends for 4 years, yet their friendship is limited to having lunch in college and engaging in casual chats about college related matters such as assignments and dissertation. Ruth never interacts with these friends outside college. During the interview she described that that both live far from her and that she has other friends with whom she prefers to spend time after college. In 4 years, Ruth has gone out with these friends only once. She described that it was a class night out in the first of college. These friends do not know anybody else in Ruth's broader network.

Ruth has been doing tap dancing since she was a child. Person 77 who she has known for 4 years is one of the friends she made in her dance class. They meet every Saturday morning for the class and talk about college, assignments and how their week went. Their friendship is restricted to the dance class and Ruth never meets up with person 77 outside the class. Person 77 also does not know anybody else in Ruth's network.

The nodes enclosed in the pink box form a clique which comprises Ruth's family (red), two friends from school (pink) and a friend she made on Erasmus while she was in Canada (blue: Person 710). Ruth feels extremely close to everybody in this clique as is apparent from the tie strength scores. She described that she often discusses matters related to *money, going away to another country and college* with her mother. She also feels very close to her father and describe that they often discuss issues as a family. Ruth's sister is about her age. They see each other at home over dinner and sometimes go to the cinema together. Ruth mentioned during the interview that they have always gotten along well and that she is able to discuss anything with her sister such as matters related to college and friends.

Persons 74 and 75 are Ruth's two best friends from school who she has known for 6 years and with who she interacts several times a week. Her relationship with these girls is based on regular interaction, social companionship and mutual exchange of social and emotional support. They often hang out in each other's homes, go shopping and watch movies in the cinema. Ruth feels she can talk to these friends about anything. She described several instances when she confided in these friends. For example she described how she sought their advice and opinion when she was assigned to go for Erasmus or when she decided to join a music society.

She also described a time when person 74 faced some family issues and discussed the matter with the girls.

“Her dad got remarried and her mom unfortunately died a few years ago. Her dad and step-mom decided they were moving to a new area and she didn’t have any choice but to go with them. She wasn’t too happy about it at the. We discussed it a lot. But she is fine with it now”

Persons 710 and 711 are two girls Ruth made friends with in Canada while she was there on Erasmus. Both lived on the same floor as her. Person 710 was also her class mate during that time. The girls spent a lot of time with each other in Canada doing varied activities largely such as going to the cinema, doing college work together and going shopping together. Both girls reside in Canada and Ruth communicates with them via Facebook. Person 710 also visited Ireland to celebrate Christmas with Ruth and her family. During this time Ruth also introduced person 710 to her school friends, showed her around the city and spent a lot of time with her at home.

Person 76 (yellow node) is a friend Ruth made randomly on Facebook. She described him as her best male friend who she has known for 3 years. Ruth does not see him much because he lives in another town. However, she communicates with him daily through Facebook and texting. Ruth described during the interview that she feels as close to him as she does to her two best friends although she has known them since much longer. Ruth discusses college related matters with him and seeks his opinion if a disagreement occurs between her friends. Person 76 knows Ruth’s two Erasmus friends and her two best friends but does not know her family.

Ruth's network is diverse in a sense that she prefers to maintain friendships in specific contexts. It appears from her interview that she is somehow aware of this contextualized nature of her friendships and prefers it that way. For example, she described that person 76 who she became friends with on Facebook is good to take advice from because he does not know her other friends.

“If I was having some sort of problem with my friends, I would talk to him because he doesn't know them very well. You know people have friends that are kind of friends with everyone they know. They maybe take sides or something but he wouldn't know most of my friends very very well. I think it's the same for other people I mentioned... I don't see persons 78 and 79 much outside college or person 77 other than the dance class. Yeah it's good to have different friends like that I think”

The tie strength scores and Ruth's interview account suggests that her strongest relationships are those she nurtures outside college settings. Of these, she feels closest to the clique described above and the two friends who are more or less connected to the clique. Chapter 8, section 8.3.4.1 will discuss what kind of drinking behaviours are prevalent in this network and how are they reinforced.

7.7 Conclusion

The results presented in this chapter contribute to the SN theory by addressing an important gap in the literature – that of identifying and locating peers who are salient and relevant to an individual. In doing so, the chapter draws attention to several key features of the examined ego networks which are described next.

First, the analysis of network composition revealed that in general, the participants named a higher percentage (more than 70%) of peers whom they knew in contexts outside of college than those from within college. Further, in most cases, more than 70% of ‘important discussants’ and the ‘overlapping nodes’ were peers from outside college. The evaluation of tie strength scores complemented by a qualitative interpretation of the meanings participants attached with the ties in their networks, confirmed that the peers who were most salient to the participants indeed existed outside college settings. These ties generally featured a high tie strength score (6 or 5), greater interaction, more shared activities, reciprocal exchange of social and emotional support and mutual confiding. Also, the people with whom the participants felt the closest comprised about 43% of the size of their networks which is equivalent to about 7 people. These figures are comparable with past research on an American sample (Christakis and Fowler, 2009) which suggests that most people have about 6 close social contacts. This provides confidence that this study was productive in eliciting the most important and salient people in the social environments of participants.

Second, the analysis of network structure combined with a qualitative interpretation of the interviews, provided evidence that the strongest ties were usually embedded in cohesive and tightly knit sub groups. For example, in networks shaped like a ‘group’ and ‘core/periphery’, the most salient ties were always embedded in the ‘group’ and the ‘core’ respectively. Similarly, in networks shaped like the ‘overlapping cliques’, the strongest ties were found to exist in different cliques which often overlapped through cross-clique friendships. In consistency with the first finding, these subgroups in most cases evolved and sustained in contexts outside of college. While the ‘overlapping cliques’ differed from the other typologies

in that the most salient ties were found to be scattered in different cliques, the majority of the salient ties were almost always embedded in the cliques outside of college.

Third, there is a general lack of network studies which have explored various structural forms ego networks can take. The present study contributes to this literature. The identification of ‘overlapping cliques’, extends the previous mixed methods network research examining the structural variations in ego networks such as Bellotti (2008). The ‘overlapping cliques’ was found to be the most common structural typology in this study and as described previously, featured a network where different cliques overlapped through common nodes or cross clique friendships.

The implications of these findings will be described more fully in the final discussion in chapter 9. The next chapter will examine the association between these salient relationships and individuals’ normative perceptions and drinking behaviours.

8 Personal Networks, Normative Perceptions and Drinking Behaviours

8.1 Introduction

The preceding chapter focused on identifying the most salient ties in the social surroundings of the participants and locating these peers in their personal networks. This chapter serves the overarching aim of investigating if there is a relationship between participants' personal networks and their drinking behaviours and related normative perceptions. A qualitative approach is adopted to investigate the correspondence between the data from web survey and that from in depth interviews. The key considerations of this procedure and related results are presented in section 8.2. In order to establish a better understanding of these results, the chapter then explores how drinking behaviours developed in participants' networks, how are they reinforced in social situations and whether drinking behaviours of the participants appear to be shaped by their networks? In doing so, the chapter extends the discussion of networks described in chapter 7 to provide a well-rounded picture of these cases. Some other interesting examples are also examined. This discussion is presented in section 8.3. A tabulated cross case analysis follows providing an overall picture of each participant's survey responses, network characteristics and themes discovered across the interviews. The chapter concludes with a discussion linking the outcomes of the two data collection methods employed in this study. The implications of these findings and their contribution to SN theory are discussed more fully in chapter 9.

8.2 Linking the web survey and interview data

One of the objectives of this study was to examine the association of personal networks with individuals' perceptions of peer drinking and their own drinking behaviours. This was addressed by comparing participants' responses to normative belief and personal consumption items on the web survey with their interview descriptions of the drinking behaviours of their network members. This comparison was carried out for each of the 26 cases. Specifically, the analysis involved examining how the participants perceived and described the drinking behaviours prevalent in their networks and whether these perceptions corresponded with those they reported in the web survey. The results from this analysis are summarized in Table 38. It was also investigated if the drinking behaviour of the participants was similar to that of their network members and if similar, whether it was influenced by their networks. These results are summarized in Table 39.

An important consideration in integrating the web survey and the interviews was the difference in nature of data. As described in chapter 5, section 5.5.6, the web survey assessed personal consumption and perceived descriptive norms by asking students to respond to closed ended questions inquiring about the frequency and quantity of their drinking as well as that of different referent groups. Similarly, injunctive norms were assessed by inquiring whether these different referent groups would approve or disapprove if the participants drank to get drunk. This generated data which was numerical or quantitative. However, inquiring about the frequency and quantity of peer drinking was neither appropriate for the unstructured format of in depth interviews nor was it always mentioned by the participants, who mostly described the drinking behaviours and attitudes of their friends through recollection of shared experiences.

In general, the participants used a variety of colloquial terms and jargon to describe the level of intoxication in their experiences of drinking with their network members. For example, the people who described the drinking of their peers as being *'tipsy'*, mostly associated this phrase with moderate drinking after which one feels *'giddy'* and *'buzzing from alcohol'* yet able to *'hold a conversation'* and *'react normally'* to situations. On the other hand, those who described the drinking of their peers as being *'hammered'*, *'messy'* *'wasted'* or *'plastered'* generally associated these phrases with heavy drinking which subsequently results in unpleasant experiences such as *'getting sick or falling over'*, *'slurring one's speech'*, *'getting into fights'*, *'having blackouts'* and *'not remembering much of the night'*.

Similarly, the participants used different expressions to describe their network members' attitudes towards *'drinking to get drunk'*. For example, those who perceived their peers to believe that *'it's a waste of money to go out and not get drunk'*, that *'drinking to get drunk is the thing to do'*, and that *'it's something that everyone does'*, associated these phrases with high approvals towards drinking with an intention to get drunk and encouraging and endorsing it regularly in social situations. Those who perceived that their peers *'would not judge someone'* if they drank to get drunk, used this phrase to describe that their peers neither approved nor disapproved of drinking to get drunk. Similarly, those, who thought that their peers *'do not like'* drinking to get drunk or that they *'think that it is stupid to do so'* or that they *'think that it is a waste of money'*, used these expressions to describe that their friends disapprove the idea whatsoever.

As is evident from the above description, the in depth interviews produced qualitative data as is generally the case with this mode of data collection. This data described (1) the relationships

participants shared with their network members and the significance they attached to these ties as has been discussed in detail in chapter 7, section 7.6 and (2) the drinking behaviours and attitudes prevalent in these networks and how they developed and sustained over time.

The results presented in Table 38 and Table 39, are thus based on a qualitative interpretation of the interviews. These results are guided by the 'sense' and the 'meaning' participants attached with descriptions of their network members' drinking behaviours and attitudes.

Respondents	Correspondence between web survey and interviews	Network members whose drinking behaviours correspond closely to perceived norms of proximal peers on the web survey		
		<i>Close Friends</i>	<i>Best Friend</i>	
1	Mary	Correspond Closely	35, 38, 36, 312, 319	31
2	Emma	Correspond Closely	43, 45, 48, 412, 415, 416	41
3	Helen	Correspond Closely	52, 57, 59, 519	52
4	Ruth	Correspond Closely	74, 75, 710, 711	74, 75
5	Linda	Correspond Closely	83, 84, 86, 87, 820	83,84,86,87,820
6	Edel	Correspond Closely	91, 94- 99	91, 93- 97
7	Pam	Correspond Closely	101, 102, 103, 105, 1014	101, 107
8	Sue	Correspond Closely	1102, 1105-1107	1102
9	Debbie	Correspond Closely	1201, 1203, 1206, 1207, 1209, 1210	1203, 1209
10	Meg	Correspond Closely	1302, 1303, 1305, 1309, 1310, 1312	1303, 1305
11	Fay	Correspond Closely	1501-1503, 1509-1511, 1513	1501-1503
12	Bella	Correspond Closely	1701-1703, 1705, 1707, 1708	1701-1703
13	Katie	Correspond Closely	1802-1804, 1806, 1809, 1810	1802, 1803
14	Amy	Correspond Closely	1904, 1911, 1912, 1915, 1918	1903
15	Lisa	Correspond Closely	2601-2603, 2606-2608, 2610-2613	2602
16	Tom	Correspond Closely	11-15, 111, 112, 115, 118, 120	11-13, 15
17	Peter	Correspond Closely	22, 23	22, 23
18	Sam	Correspond Closely	61- 63, 67-69, 611, 613	61-63, 611, 613
19	Alex	Correspond Closely	1402, 1405	1402, 1405
20	John	Correspond Closely	1604-1607, 1612, 1619, 1620	1604, 1605
21	Adam	Correspond Closely	2003-2005, 2008, 2009, 2013-2017	2003-2005
22	Brian	Correspond Closely	2101-2103, 2105, 2106, 2108-2110	2106
23	Cormac	Correspond Closely	2203, 2213	2203, 2213
24	Gary	Correspond Closely	2301, 2308-2310	2301
25	Rob	Correspond Closely	2406- 2408, 2410-2412, 2415, 2417	2403
26	Ken	Correspond Closely	2502, 2506	2501

Table 38: Association between perceived norms and personal networks. Gender: Pink (Female), Blue (Males), Drinking Cohort: Red (High), Orange (Moderate), Green (Low)

Table 38 demonstrates a close correspondence between perceived drinking of proximal peers as reported in the web survey and the perceived drinking of some network members as it

appears from the interviews. These findings provide validation to the web survey. Further, the peers identified in the preceding table (Table 38) were found to be very salient in the social lives of participants and contributed to their emotional well being. The saliency of a relationship was established on the basis of tie strength scores and the meanings participants associated with these ties as described in detail in chapter 7. In general, the peers identified in Table 38 shared strong and long standing friendships with the participants based on mutual trust and confiding, regular interaction, multiple shared activities and social companionship. Further, these peers were found to be embedded in tightly knit and intimate sub groups. Participant generated numerical scores indicated that these relationships also scored high on tie-strength. Given the significance and social proximity of these peers, the above findings suggest the possibility that the participants might have been referring to these salient network members as their proximal peers in the web survey. It means that the participants might have been thinking of these individuals when they responded to questions on perceived norms of proximal peers in the web survey.

The association between participants' own drinking behaviours and that of their network members is presented in Table 39. The table illustrates the correspondence between participants' self reported personal consumption in the web survey and perceived drinking behaviour of their network members as it appears from the interviews. It also identifies the salient networks members whose drinking behaviours were found to be very similar to that of the participants and appeared to influence them. As commented earlier, these results are based on a qualitative interpretation of the interviews. In addition, the table also presents the gender, drinking cohort and network typology of each participant for easy reference.

Respondents		Network Typology	Extent of agreement between drinking behaviours	Salient network members whose drinking behaviours appear to influence that of the participants
1	Mary	Overlapping Cliques	Correspond Closely	31, 35, 38
2	Emma	Overlapping Cliques	Correspond Closely	41*, 45
3	Helen	Overlapping Cliques	Correspond Closely	52
4	Ruth	Contextualized	Correspond Closely	74, 75
5	Linda	Core/periphery	Correspond Closely	83*, 87
6	Edel	Overlapping Cliques	Correspond Closely	94-99
7	Pam	Overlapping Cliques	Correspond Closely	101, 102*
8	Sue	Overlapping Cliques	Correspond Closely	1102, 1106, 1107
9	Debbie	Overlapping Cliques	Correspond Closely	1201, 1203, 1206, 1207*, 1209, 1210
10	Meg	Overlapping Cliques	Correspond Closely	1303-1305, 1309, 1310, 1312
11	Fay	Group	Correspond Closely	1509-1511, 1513
12	Bella	Overlapping Cliques	Correspond Closely	1701-1703*, 1705*, 1707, 1708
13	Katie	Group	Correspond Closely	1802-1804*, 1809, 1810
14	Amy	Overlapping Cliques	Correspond Closely	1901*
15	Lisa	Group	Correspond Closely	2601, 2602, 2606, 2608
16	Tom	Overlapping Cliques	Correspond Closely	13, 14, 111, 112
17	Peter	Overlapping Cliques	Correspond Closely	22*
18	Sam	Overlapping Cliques	Correspond Closely	61-63, 613
19	Alex	Small Clique	Correspond Closely	1402*, 1405*
20	John	Overlapping Cliques	Correspond Closely	1605, 1619, 1620
21	Adam	Group	Correspond Closely	2003-2005
22	Brian	Group	Correspond Closely	2101, 2103, 2105, 2106
23	Cormac	Overlapping Cliques	Correspond Closely	2203, 2213
24	Gary	Core/periphery	Correspond Closely	2301
25	Rob	Overlapping Cliques	Correspond Closely	2403, 2412
26	Ken	Group	Correspond Closely	2501*

Table 39: Association between individual drinking behaviour and personal networks.

Gender: Pink (Female), Blue (Male). Drinking cohort: Red (High), Orange (Moderate), Green (Low).

Table 39 depicts a close correspondence between self reported drinking behaviours of the participants and the drinking behaviours of some network members. These peers were identified to be very salient to the participants and were found to be embedded in dense subgroups within the participants' networks. In general, this similarity in drinking behaviours appears to be an effect of peer influence. It is important to acknowledge that the cross sectional design of this study makes it difficult to draw causal inferences about peer influence with certainty. The alternative reciprocal explanation that similarity in drinking behaviours of the participants and their salient peers could be an effect of peer selection rather than influence may be true. It means that the participants may have chosen to become friends with people whose drinking behaviours were similar to their own. However, the combination of survey data and qualitative interviews in the present study offered a way to determine if the age at which the participants started drinking preceded the friendships in their networks or followed them. As described in chapter 5, section 5.5.6.1, one of the items on the web survey inquired about the age at which respondents began drinking alcohol. In addition, the alter attribute chart filled out as part of each interview, captured among other details, the duration for which participants had known each of their network members. Based on this information, it was possible to distinguish the ties where either peer influence or selection might have resulted in similarity of drinking behaviours from those, where 'peer selection' could not have been a likely explanation. This is because in case of the latter, friendships were formed before the participants started drinking. Most of the peers identified in Table 39 fall in this latter category. It appears from the interviews that most participants started experimenting with alcohol in the company of these salient friends developing very specific attitudes and behaviours towards drinking (More on this in section 8.3 and 8.4). In addition, the qualitative nature of in depth

interviews allowed examining the contexts in which friendships and drinking behaviours developed, sustained and sometimes changed in a network. This knowledge about the functioning of networks strengthens the aforementioned findings. The asterisks (*) in Table 39 indicate the relationships where age of first drink preceded a friendship. In these cases, it can be argued that either peer selection or influence might have resulted in similarity of drinking behaviours between network members and participants. However, as will be demonstrated in sections 8.3 and 8.4, the latter offers a more likely explanation.

In order to understand, clarify and elaborate the aforementioned results the following section presents a discussion of some networks and explore how drinking behaviours developed and sustain within them.

8.3 Development and Reinforcement of Drinking Behaviours in Networks

Chapter 7 presented the networks of some participants, discussed their composition and structural variations and identified the strongest ties within these networks. This section explores how drinking behaviours and attitudes developed within these networks and how are they reinforced and upheld by the members in social situations.

8.3.1 The Overlapping Cliques

8.3.1.1 Sam's network

As has been described in chapter 7, Sam is a 23 year old participant who drinks heavily. Sam's network is reproduced in the following visualization

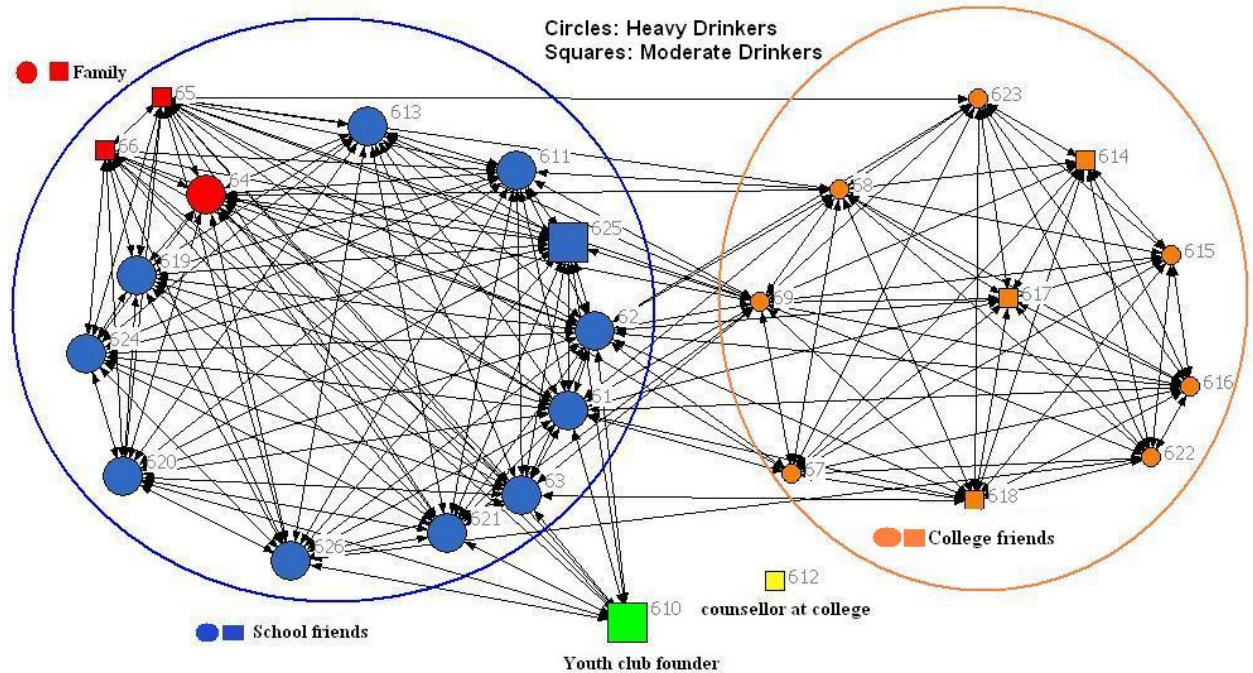


Figure 20: Sam's overall network

It appears from Sam's interview that most people in his network are heavy drinkers like himself. These are represented by circles in Figure 20. Sam's network is shaped like 'overlapping cliques' where the people encircled in blue represent the clique of school friends and family who he has known for 15 or more years and those encircled in orange represent the clique of college friends whom he has known for about 3 years. As described in detail in chapter 7, section 7.6.2, majority of the people most salient to Sam are embedded in the clique of older friends with whom he interacts regularly in both drink and non drink related ways and with whom he shares inner thoughts and personal matters.

Sam started drinking when he was 15 years old. His earliest experiences involving alcohol occurred in the company of his older friends from school who are embedded in the blue clique and who live in the same area as him. Of his school friends, Sam drinks regularly and the most

frequently with his tight group of friends which includes person 61, 62, 63 and 613. Persons 611 and 625 also accompany them on most occasions though the latter was not drinking at the time of the interview because of a health condition.

Sam described that him and his friends drank heavily throughout school years. He still drinks with them every week. He described that a 'typical' drinking night with these friends would start with a *'pre drinking session'* at someone's house where each of the lads would bring a '6-pack' of beer and the girls would bring a bottle of wine each. They would all drink in the house till mid night after which they'd head out to night clubs or pubs where more drinks would usually follow. Sam described that sometimes they'd visit two or three pubs during the same night, enjoying *'a few drinks'* in each and would usually end up getting *'fairly hammered'*. Sam usually drinks with his school friends in group settings. The only exception is person 61 who is one of his best friends and with whom he sometimes drinks outside of the group. He described these occasions as their *'random nights'* and explained that every once in a while, they meet up in their homes and enjoy an informal night of TV and conversation over drinks. Sam described that these nights are not aimed at getting drunk however he feels that usually *'as the night progresses and drinks flow more freely'*; they do get quite *'hammered'*.

During the interview, Sam talked about the drinking behaviours of his network members. It appears from his interview that heavy drinking is considered as *'normal'* in his circle of school friends where it is very *'rare'* for someone to drink *'just 4-5 bottles of beer and head home'* on a night out. Sam feels that *'drinking to get drunk'* is regarded as a *'positive thing to do'*, and frequently reinforced at house parties and get-togethers with these friends. He described several occasions where drinking had resulted in one of his friends getting sick, engaging in

unwanted sexual acts and even getting injured. For example, he described an occasion when person 62 got drunk and slept with a girl mistaking her to be his girlfriend, later getting in trouble with both girls. He also spoke about how person 611 injured his hand from a broken bottle of beer during a game they were playing in a pub and lost sensation in one of his fingers.

“We used to find the game hilarious when we were young. But that time, he sliced his finger and it was a really deep gash. That night he got in an ambulance. They wouldn’t take us in the ambulance because we were fairly hammered...me and another guy. We had to walk to the hospital without knowing where exactly it was and we spent about two hours trying to find him.”

Sam’s description of his school friends’ drinking behaviours also suggests that these youngsters respond to group norms by trying to ‘keep up’ with each other when they are drinking. For example, Sam described how in the younger years, person 62 used to get very drunk because he tried to keep up with those who were physically bigger than him and thus had a higher tolerance towards alcohol. Similarly he feels that two of his female friends, persons 63 and 626 drink too much almost every time they are together.

“They drink a bit too much for what they can handle. They always end up quite giddy I would say in trying to keep up with others I suppose. There have been a couple of times when I have held person 63’s hair while she was throwing up somewhere”

Sam feels that he has deliberately distanced himself from some of his school friends, particularly, the ‘jocks’ (persons 619, 620, 621 and 624). He explained that his friendship with these lads was primarily based on drinking. A night out with these lads would involve heavy drinking of which drinking games were a regular feature. Sometimes Sam and the lads would play 3-4 drinking games at the same time. They would also intentionally upset other people,

verbally abuse them and encourage each other to do the same. Sam felt that the reputation of this particular group was suffering because of their ‘notorious’ attitude and he felt that he had to pull away.

“I have found myself distancing myself from them because the nights out were the friendship if you get me. As a group I found it a bit artificial and forced. It was like the lads were living in past glory and remembering the good old days and not really moving on with their lives. I am still mates with them and I meet up with them because we still train for football and I feel bad because they are a part of my childhood. I have grown up with them”

He also described how different people in the group felt pressurized to conform to their ways.

“Person 619 is a lovely lad almost childlike in a way. He would never openly hurt someone’s feelings but he is swayed by the group. He will get himself involved and even if he is not verbally slagging anybody, he’d laugh along. Person 620 is similar, he just does whatever the group does, he doesn’t like making his own decisions. Person 624 is more territorial. He likes the group of friends to remain a group of friends and he doesn’t like outside interferences and he doesn’t like when people leave from a group of friends. Person 621 and a couple of others, when they have a few drinks in them, they are assholes”

Sam’s description of the drinking norms of this particular group indicates that he rejects their norms after having conformed to them for several years because he felt that his reputation was at stake. Reflecting on his decision to distance himself from the ‘jocks’, he recalled that it took a while before he was able to stand up and disagree with the drinking habits of the ‘jocks’. On the other hand, person 611 was able to do it more easily.

I was sort of saying it in a polite way that I am not (stresses) going to be doing this, whereas person 611 was like 'no, I just told you I am not doing it, it's bullshit' and he tore people out of it. Whereas I was in a passive way saying that 'I don't want to play this game'.

The majority of people Sam knows from college are also heavy drinkers. Of these, persons 67, 68 and 69 who are in his class often socialize with his bigger group of friends outside college. Sam feels their drinking behaviour is similar to that of his school friends.

"They are the same like us. They wouldn't just have like 4 or 5 cans. They would have the pre drinking and then night out drinking shots and a lot more. They'd keep pace with the best drinkers that are out there"

There are some people in the orange clique with who Sam became friends through college nights out. These are persons 614, 615, 616 and 623. He describes them as *'a good crack'* and feels that they are very outgoing people who are fun to hang out with. It appears that Sam's friendship with them is based around nights out and drinks related socialization though he does not go out with them as often as he does with his old friends.

Of family, his parents are occasional drinkers and do not approve *'drinking to get drunk'* whereas his younger brother who is 22, drinks heavily. Sam described him as a *'stereotypical party boy'*. Sam does not drink with his family except on special family occasions. He and his brother socialize with their own groups of friends. Sam described that sometimes they end up in the same night club because they all live in the same general area. On these occasions, he and his brother chat briefly before going back to their own circles. It is clear from his description that his family does not have any impact on his drinking habits.

Sam's survey response suggests that he perceives his proximal peers (close friends and best friend) to drink to drunkenness once a week and consume 15 or more drinks on an occasion. These perceptions correspond closely with those of his strongest ties. Sam's own drinking behaviour is largely similar to that of his school friends and appears to be influenced by his tight circle of friends comprising persons 61, 62, 63 and 613. These friends as has been shown are embedded in a very cohesive clique. He feels attached to these friends, confides in them and shares multiple activities with them as has been described in chapter 7. He has been drinking with these friends for several years and responds to their norms. For example, he mentioned that he finds it very difficult to *'not drink'* when in the company of these friends because it is their main way of socializing. He also described that he sometimes finds it difficult to voice his opinion clearly if it disagrees with that of his friends' and tries to *'please people'*.

"I am kind of more of a people pleaser. I try and smooth things over rather than become confrontational and say it loud".

8.3.1.2 Meg's Network

Meg is a 19 year old moderate drinking participant who has a network shaped like 'overlapping cliques'. Meg's network comprises a clique of college friends (pink encircled) and a clique of friends and family from outside college (blue encircled). As described in chapter 7, the people Meg feels closest to lie in the bigger clique of older friends that she knows from school or through a voluntary organization she works in.

Her network is reproduced in the visualization that follows.

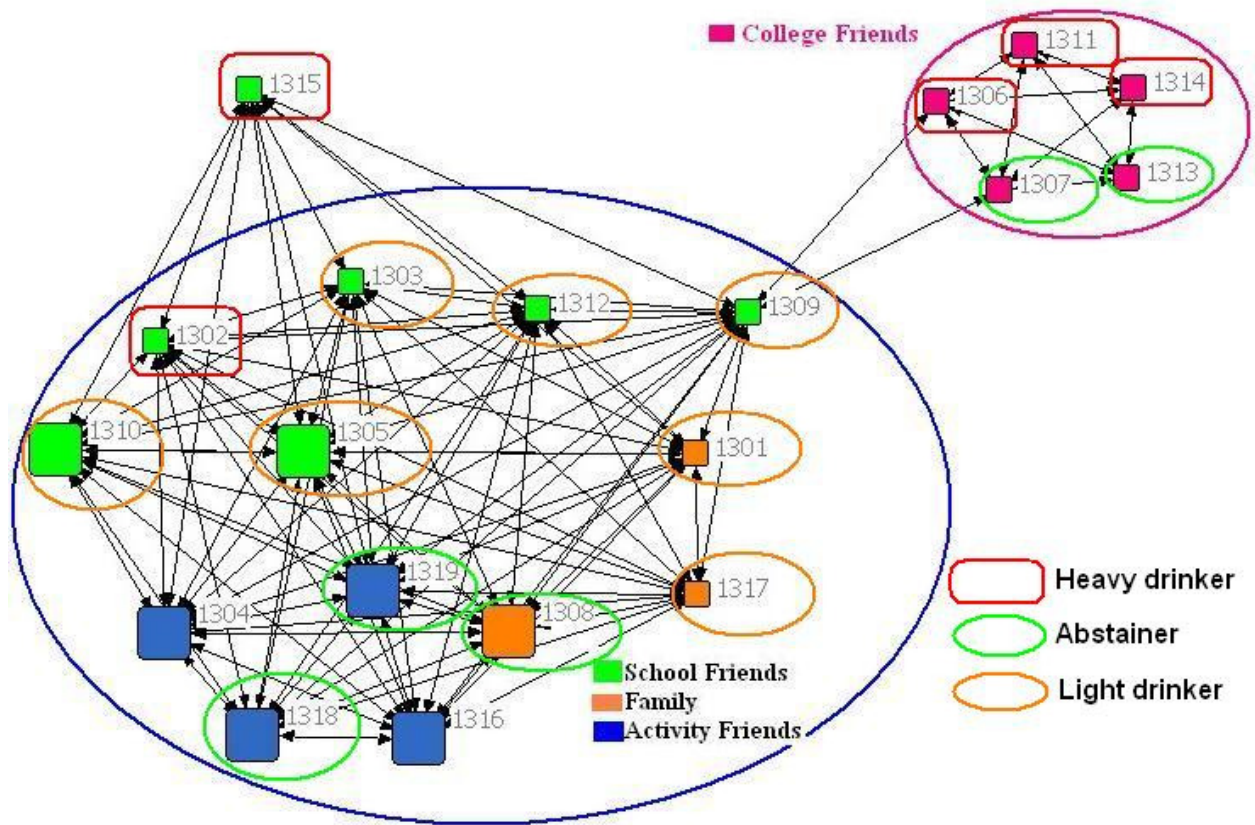


Figure 21: Meg's overall network

Meg feels that nobody in her network drinks to excess. As is illustrated in the above visualization, most people in her network are either light drinkers or do not drink at all. Her mother drinks occasionally and one of her sisters is a complete abstainer. Only 5 people (out of 19 named) in her network drink heavily. She explained during the interview that those who do drink alcohol *'know how to handle their drink'*.

Meg started drinking when she was 18 years old. She is 19 now and had been drinking for about a year and a half at the time of the interview. When she started drinking alcohol, it was

in the company of her school friends (green nodes in the above visualization) with who she interacts regularly. They drink together once every two weeks. Among these girls, persons 1303, 1305, 1309 and 1310 *'do not drink much'*. Meg recalled that person 1303 had *'one bad experience'* when she started drinking alcohol after which Meg has never seen her drink to excess. It happened at their *'Debs'*²⁵ when person 1303 had to be carried home because she had gotten sick as a result of drinking. Meg described that her friend had not like the feeling and has never put herself in a similar situation.

In general, Meg's school friends drink in moderation and do not believe in *'drinking to get drunk'*. Meg feels that they do drink for *'fun'* but never for the sake of drinking. During the interview she described that most of her friends do not give in to *'peer pressure'*.

"When we were in school person 1303 never felt like having to agree with someone just because she thought they would like it. There'd be groups in school and she never had to be friendly with one particular group if she didn't want. She'd always be friendly because she wanted to be not because she had to. I think most of my friends are the same. We have our own opinions and we are always quite confident about them."

It appears from her interview that the norms of this group of school friends are strongly reinforced in social situations and that the girls neither appreciate deviant behaviour nor encourage it by mutual participation. She described several instances when opportunities for

²⁵ A *'Debs'* is a formal ball for students in their final year of secondary school in Ireland, analogous to the *'Prom'* in American schools.

heavy drinking were turned down by the girls. For example she described a time when person 1305 had a breakup with her boyfriend who had cheated on her. Meg feels that her friend wanted to drink to get over her problem and ease her mind. However, the girls did not encourage her behaviour.

“She broke up with a boyfriend recently and she wanted to go out and just get drunk. I think that was mostly to do with her being upset and not wanting to think about it. We wouldn’t go out with her because we knew what she wanted to do, so we just gave her a bit of time to think. Eventually she realized that that’s not going to work and I think she calmed down a little bit after that. She is her normal self now”

Similarly, Meg recalled how person 1302 who is one the heavier drinkers among her friends changed her drinking habits when she became friends with Meg and the other girls.

“She was the type that would meet up with the wrong kind of people. Just the type that would not go to school quite as much and be very anguish all the time, that yell at people and cause trouble just for fun. She drank in fields and stuff but she stopped that when she ended up making friends with me, persons 1303, 1305 and 1312. We won’t be late partying and wouldn’t go out as much. She had to adjust to things that we did, like going down for shopping (laughs), watching movies things like that”

As described in chapter 7, section 7.6.2, Meg takes a holiday with these friends every year. She described one of these holiday with the girls at her family’s holiday home. They had just turned 18 at the time when person 1315 insisted on heavy drinking during the holiday. Meg recalled having felt very annoyed at that.

“The first year was grand because we were all 17 and couldn’t drink, the next year she wanted to drink an awful lot during the holiday. I didn’t want to drink because I thought we didn’t want it to be a

drinking holiday and then she said 'this is a drinking holiday' and I was like 'No this is not'. We were away from families and away from authority and she just wanted to buy drinks and go out every night. At that stage I and the other girls still didn't drink that much at which she was annoyed that 'you need to get drunk' and I replied 'no, we really don't', But it didn't really work out that way anyway. Nobody got really bad"

Although Meg feels that her friends do not feel compelled to drink heavily because other people do so, it appears from her interview that some girls drink differently when they are with their other friends. For example she described that person 1302 lives in another town because of studies and often goes out with her college friends.

"Just heard some stories from where she lives. I think that's what happens down there. They just drink an awful lot. I won't hear that much because I don't drink that much, she doesn't tell me too much about it either. But I know that she knows her limits now and can handle herself"

Similarly she described that person 1315 whom she does not feel very close to often socializes with her college friends who drink a lot as a result of which she often gets drunk.

It appears from her interview that she tries and conforms to the norms of this particular group of friends even when she is drinking away from them such as with her college friends and her boy friend.

Meg described that of college friends, persons 1307 and 1313 do not drink for religious reasons. The former is a Hindu and the latter, a pioneer. The remaining 3 girls (persons 1307, 1311 and 1314) drink heavily. Meg described that whenever they go out, persons 1307 and 1314 typically spend most of the night at the bar and that she has never seen them come home sober. Meg feels that these friends drink with a deliberate intention to get drunk and 'wouldn't

stop until they couldn't drink any more'. Although person 1311 also drinks heavily, Meg thinks she does so because she feels compelled to drink as much as person 1307 who is her very close friend.

"She'd try to keep up with person 1307. She kind of wants to keep up with her. The two of them are quite close and she just wants to be the same. They just drink the same amount. If person 1307 went out for the night and didn't drink at all, I'd say person 1311 would only have 1 or 2 because then she wouldn't see the point"

Meg goes out with these girls once or twice a month depending on college work. It appears from her interview that she does not feel pressurized to drink like the girls when she is with them. For example, she explained that on a typical night out with these girls, she is usually the only one who remains sober whereas the other girls *'drink a lot'*.

Person 1304 who is Meg's boyfriend works full time and Meg feels that he likes to drink, to relax himself in social situations but never gets drunk. She described that he is usually reluctant to go on the dance floor unless he has had a few drinks. Meg recalled that at the start of their relationship he was a *'little uncomfortable'* about the fact that she didn't drink as much as him. Although Meg described that he has accepted it now, she feels that she has to drink every now and then with him because he likes it.

"He asked me in the beginning of our relationship if I would drink as well and I had said 'No'. So just at the beginning, he would have liked if I drank and sometimes he'd even ask. I do drink every now and then when I am with him but not to get drunk"

They drink in social situations as well as enjoy a quiet drink at home when they are by themselves. Meg works in a voluntary organization as explained in chapter 7. Most of her friends in the voluntary organization (represented by the larger nodes in the above visualization) are either abstainers or moderate drinkers. Two of her school friends and her sister are also part of the voluntary organization. They often socialize together as a big group at the local pub or at the events related to voluntary work though not everyone drinks.

Meg's response to the normative belief items on the web survey indicates that she perceives her proximal peers to drink 2-3 days a month, have 3-4 drinks on an occasion and never drink to drunkenness. There appears a close correspondence between these perceptions and those of her school friends which she described during the interview. Her own behaviour matches closely and appears to be influenced by the norms of her group of school friends who she feels closest to of all the network members. These friends are embedded in the clique of older friends she knows in contexts outside of college. It also appears that she feels compelled to drink more often than she prefers when she is with her boyfriend. However, her boyfriend understands and accepts that she will not drink with an intention to get drunk.

8.3.1.3 Sue's Network

Sue is an 18 year old participant who drinks heavily. In chapter 7, her 'important discussants' network' was discussed which is shaped like a 'small clique'. In order to understand the drinking behaviour of Sue's peers, it is the wider network that needs to be examined rather than only those with whom she discusses important matters. Therefore, her 'overall network' is discussed here which resembles 'overlapping cliques' as shown in the following visualization. There are 7 members in this network.

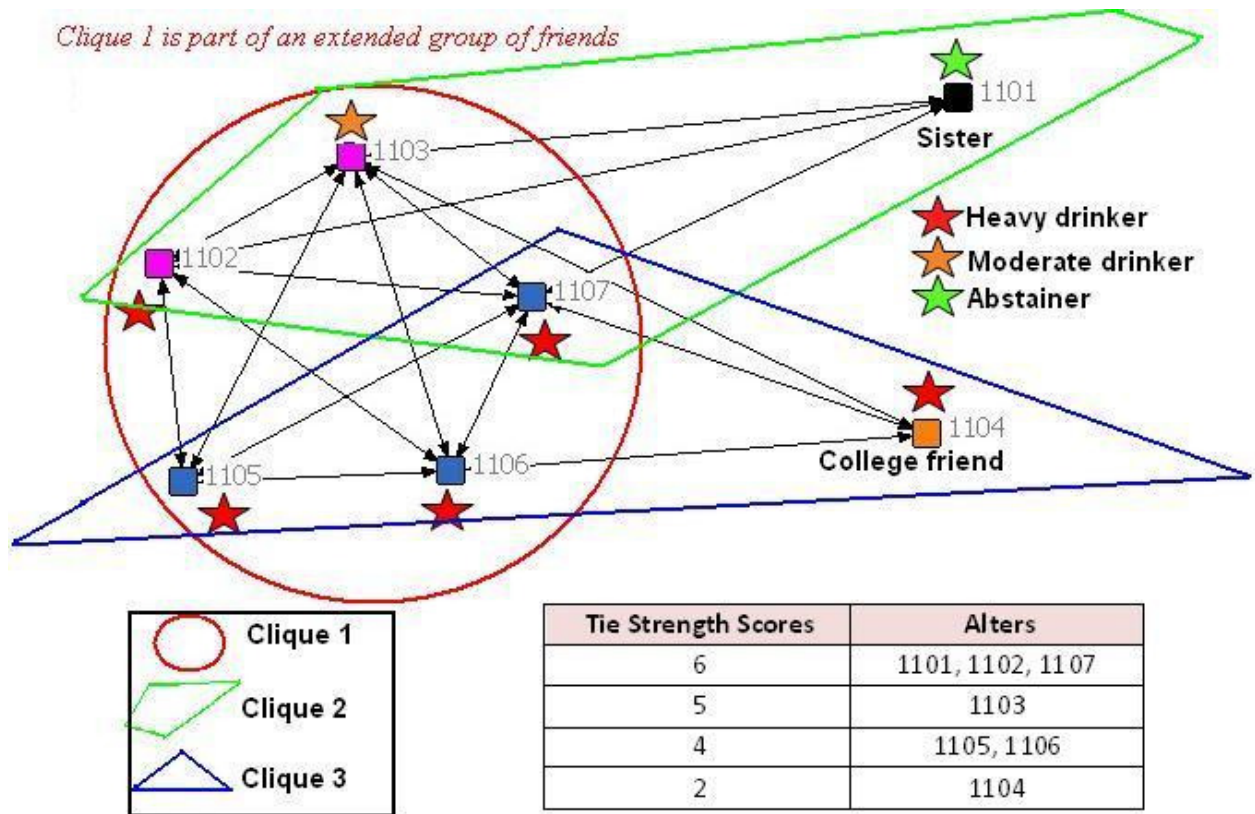


Figure 22: Sue's overall network

Clique 1 which is encircled in red, comprises Sue's school friends. The pink nodes are the girls and the blue nodes are the lads. Persons 1102 and 1103 who were also part of her 'important discussants' network, have already been introduced in chapter 7, section 7.6.1. They are both very salient to Sue. Persons 1105, 1106 and 1107 are three male friends she made in the transition year²⁶ of school. Sue feels that she can '*discuss anything*' with the lads. Her relationship with them is based on mutual trust and exchange of social and emotional support. They socialize regularly in both drink and non drink related ways, have the same wider circle

26 Transition Year (TY) is an optional one-year school programme that may be taken in the year after the Junior Certificate in Ireland. It is intended to make the senior cycle a three year programme encompassing both the Transition Year and the Leaving Certificate.

of friends and understand each other very well. Of the lads, she feels closest to person 1107 with who, she was also in a relationship. They are no longer together but Sue described that they have worked ‘*very hard*’ on their friendship and that she feels they will be ‘*friends forever*’

“It was hard at first to remain friends because we had to see each other in social situations. We have the same group of friends. A lot of people would cut the strings and never see each other again but I preferred to have him as a friend than to have him as nothing at all. He went out with me for a very difficult period of my life because that was when my dad was recovering and my granny just passed away and my mum was not coping so well with all the stress. The fact that he managed to stick around with my crazy ass when I was so moody says a lot about him”

Persons 1107 and 1106 share a flat with each other. Sue feels that person 1106 is like an ‘*elder brother*’ to her. She described that he is very protective of her which she appreciates.

“If someone is not getting the message or is giving you the creeps on a night out, person 1107 would come over and he’d just be like ‘no, she is alright, leave her alone’. He’s like a bodyguard at that stage, he’ll stay with you the whole night and walk you home and you know nothing’s going to happen when he is there. You just feel safe. It’s almost like he is the bodyguard of the group and he minds all the girls”

Person 1105 goes to a college in Galway which is why Sue does not see him as often as the others. She however talks to him every day and meets him every month. Sue described that person 1105 is one of her ‘*best guy friends*’ with whom she can discuss personal issues and whose advice she values.

It appears from Sue's interview that clique 1 is part of an extended 'group' of friends comprising at least 20 people. These friends have known each other from school and interact on regular basis. Sue described that they meet regularly for DVD nights in each others' homes, go to rugby matches and socialize on nights out two to three times a week. Of this 'group', she mentioned only the 5 friends embedded in clique 1 because she feels they are her '*closest friends*'.

Sue began drinking when she was 13 years old. She described that everyone in the group began drinking around the same time. It appears from her interview that the 'group' was heavily involved in '*underage drinking*' for several years. Sue recalled that within the 'group', drinking to drunkenness was approved and regularly reinforced in social situations.

"When we were young, we thought drinking as much as you could was cool. If you drank so much then everyone would think you are class. So we did that a lot"

Sue still drinks regularly with friends in the group. A typical night involves '*pre drinking*' at someone's house before heading out to the night clubs. Sue described that '*pre drinking*' is seen as a time to socialize with friends and drink so that one would not have to buy drinks in the night club. She further described that there is a '*perception that one needs to drink a bit more so that the effect will last through the night club*'.

During the interview she talked about the drinking behaviour of her friends. It appears that most people in her network are heavy drinkers (indicated by the red stars) who engage in heavy episodic drinking from time to time. Even those who drink moderately or abstain from drinking alcohol did drink heavily at some stage in the past.

She described that person 1102 who is her best friend, is heavily involved in sports because of which she has to be wary of her drinking. She prefers not to drink when she has trainings and matches. It is clear from the interview that though person 1102 does not drink frequently, she engages in sessions of heavy drinking when she gets the chance and considers '*drinking to get drunk*' as a positive and an acceptable thing to do. Sue feels that it is '*alright*' because person 1102 does not drink every week. She described an occasion when they were drinking as a group and person 1102 had to be '*taken care of*' because she had gotten '*too drunk*'.

“She drank too much and she was quite bad. She was all over the shop, stumbling and walking and slurring her speech. But it’s never a problem. When someone is bad in our group which does happen sometimes, you know that you are with people you can trust to mind you and to bring you home, no questions asked and they are always there for you if you need it. I brought her home that night and the next day she apologized but there was no need for an apology”

Sue feels that person 1106 has a similar drinking behaviour because he too is involved in sports. She thinks that he has a very good attitude towards drinking because he '*enjoys the night but does not drink to an extent that he won’t be able to remember the night*'.

Persons 1105 and 1107 drink to excess regularly. Sue described that person 1105 gets drunk and causes trouble by picking fights with people almost every time he goes out. There have been instances when he has broken his hand or has required stitches as a consequence. Sue feels that it has reached a point where the lads in the group are '*somewhat reluctant*' to go out with him because they always find themselves '*looking out for him and joining in on fights because they are friends*'.

“He becomes fearless. He will stand up to 3 guys 10 times his size and just run his mouth saying stupid (stresses) remarks and get himself into trouble. He thinks he can do anything that he is untouchable. I fucking hate it. It’s almost as if he takes on a different persona when he drinks. He is such a nice guy and then to become this rowdy person looking for fights and smashing bottles. I know for a fact that everyone in the group doesn’t like when he drinks”

Sue described that person 1107 relies on ‘*the drink*’ to deal with his problems and becomes a ‘*mess*’ when there is something upsetting him. She recalled several instances when he has been drunk because there was a problem in the background. For example, she described how he had become ‘*unconscious*’ as a result of drinking continuously for several hours at his brother’s wedding. Sue feels that he was ‘*upset*’ because his brother who is very close to him was moving away to another country after the wedding.

“He’ll drink until he can’t walk, can’t talk, can’t do anything and it’s almost like an outlet for him. We know that it is his way of dealing with a problem, just to escape from it. Everyone deals with stuff differently. And maybe it’s not a positive thing but it works for him’

Of all the friends in the group, person 1103 is the only one who began drinking at the legal age of 18 years. Sue feels that it was a ‘*very hard thing to do*’. She described that person 1103 is the most mature drinker in the group who does not approve ‘*drinking to get drunk*’ and ‘*knows her limits*’. Sue described an occasion when person 1103 drank to excess because she was upset over her breakup. This was the only time in their friendship when Sue had to ‘*mind her*’.

“That night when we went out as a group she drank to forget how upset she was. We have the same group of friends and her ex is in that group. Although they have broken up she still has to see him in social situations. That made it a bit harder for her. She just drank too much to get rid of the awkwardness”

Clique 2 comprises persons 1101, 1102, 1103 and 1107. There is only person in this clique – Sue’s sister, who was not a member of clique 1. The other three members of this clique overlap between cliques 1 and 2. As has been described in chapter 7, Sue’s sister (person 1101) is a recovering alcoholic who suffers from alcohol induced epileptic seizures. Sue is extremely close to her sister and spoke at length about how her sister was bullied in primary school as a consequence of which she began drinking excessively.

“When she started secondary school she was still raw from the bullying in the primary school. She just got in with a bad (emphasizes) crowd of people who were smoking and drinking all the time. She didn’t enjoy it, she was doing it to fit in. When she was 16, it really started going downhill. She went mental basically, drinking till odd hours and not coming home, not telling my parents where she was. Eventually her body just gave in from dehydration and she started having epileptic seizures”

Sue’s sister cannot drink alcohol anymore because of her health. While Sue spends a lot of time with her, she never drinks with her sister.

Clique 3 is formed by persons 1103, 1104, 1106 and 1107. The only person in this clique who was not a part of clique 1 is person 1104 who is also the only friend she named from college. The remaining three members of this clique overlap between cliques 1 and 3. Sue has known person 1104 for only a few months but feels that she is very ‘similar’ to her closest friends - persons 1102 and 1103. Sue spends a lot of time with her in college and socializes with her on nights out. They go out drinking several times during the week and person 1104 usually stays at Sue’s flat after the night. Sue described that she is a good drinker who ‘*knows her limits*’. However, it appears from the interview that person 1104 does drink to excess from time to

time. Sue described several occasions when she got sick as a result of drinking and had to be *'taken care of'*.

Of clique 1, persons 1102 and 1105 live outside Dublin. Sue does not drink with them as often as with the others. However, they meet once a month when they come home or when Sue visits them. On these occasions they go on nights out and drink. Persons 1103, 1104, 1106 and 1107 live in Dublin. They socialize a lot and Sue drinks with them several times a week. Sue's response to the web survey suggests that she perceives her proximal peers to drink twice a week and consume 9-10 drinks on an occasion. It appears from her interview that these perceptions correspond closely to several of her friends particularly those embedded in clique 1 who are very salient to her. Sue's drinking behaviour is similar to theirs. However, it appears that Sue does not consider herself or her friends to be heavy drinkers. While she feels that some of her friends such as persons 1102, 1103 and 1106 are capable of going on nights out and not drink, she tends to overlook the instances when they do engage in heavy drinking. For example, Sue feels that since person 1102 does not drink often because of her sports commitments, she is entitled to drinking as much as she likes when she gets the chance. Similarly she thinks that though person 1107 drinks to drunkenness to deal with the *'slightest of problems'*, his drinking habits are positive.

"I definitely wouldn't say that he has a bad (stresses) attitude to drinking but I'd just that his attitude isn't as good as some of my other friends such as person 1106"

It appears from her interview that Sue's drinking behaviour matches closely with that of her extended *'group'* of school friends of which she named only her closest friends who are embedded in a clique. These people knew her before she began drinking. They started drinking

together, drank heavily for several years and as a group, reinforced the belief that it was a favourable thing to do because it makes one look ‘classy’. Sue still drinks with them several times a week and shares inner thoughts with these friends. It strengthens the possibility that Sue’s drinking behaviour is influenced by friends in this particular group as it appears to be the most salient in her social life. Although she did not name her parents in her network, it appeared from her interview that they do not influence her drinking behaviour. Unlike her, they are occasional drinkers who do not approve ‘drinking to get drunk’.

8.3.1.4 Peter’s network

Peter is a 20 year old male participant who drinks moderately. Peter named 13 people in all, of which there were 4 males and 9 females. The tie strength scores for his network are as follows. The nodes enclosed in parenthesis represent the people he named in both the ‘important discussants’ network’ as well as the ‘socialization network’

Tie Strength Scores	Alters
6	21, (22, 23)
5	210, 213
3	24, 211
2	27, 29
1	25, 26, 28, 212

Table 40: Tie strength scores for Peter's network

Peter’s network resembles ‘overlapping cliques’. There are three distinct cliques in this network as has been highlighted in the following visualization.

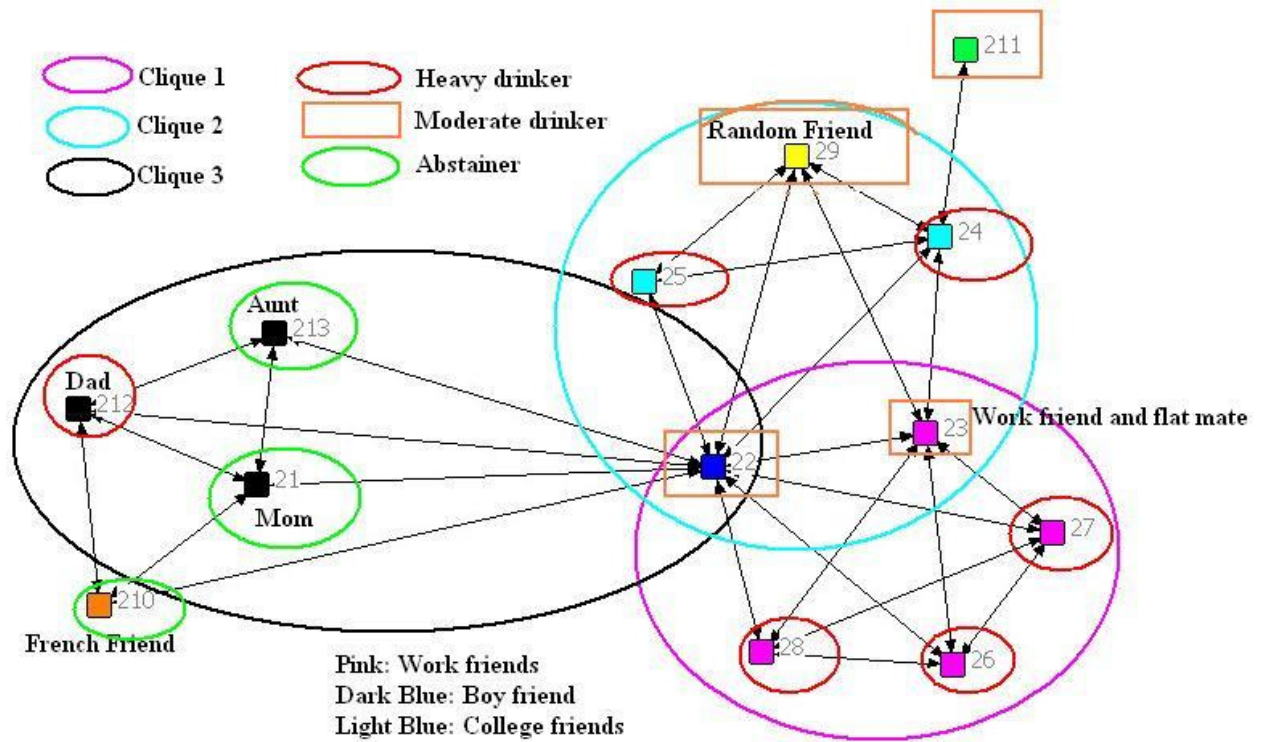


Figure 23: Peter's overall network

Peter started drinking when he was 16 years old. He did not name any friends who would have known him before he began drinking (except his family) which is why it is not possible to say with certainty that anybody in his network influences his drinking. However, it appears from his interview that he used to drink a lot before he met his boyfriend (person 22). He not only changed his drinking behaviour after having met person 22 but also rejected the norms of some of his heavy drinking friends and distanced himself from them.

The first clique in this network which has been encircled in pink is formed by Peter's work mates (pink nodes) and his boyfriend (person 22). Peter works in a pub and has known his work mates for a year. Of these friends, he feels closest to person 23 who is also his housemate. Peter described her as his best friend. He spends a lot of time with her at work as

well as at home. They socialize in both drink and non drink related ways. Peter recalled several occasions when he discussed personal issues with person 23. He feels he can discuss his relationships with her openly which is a very private matter for him. He described her as a very sensitive person who has been through several harsh experiences such as rape, unwanted pregnancies, abortion and miscarriages. Peter feels that these experiences have left her *'deeply traumatized and unable to trust people'*. His friendship with her is based on social companionship, mutual confiding and exchange of emotional support. Peter described her as a moderate drinker. However, it appears from his interview that although she does not drink often (twice a month); she drinks to drunkenness when she does go out.

"She wouldn't be too keen on having just a drink. She thinks it's cool and that you need it to relax. She drinks to get drunk and wouldn't drink otherwise really"

Peter described that his other work mates namely persons 26, 27 and 28 are heavy drinkers who drink most nights of the week. They are all females who work full time in the pub and Peter sees them every day in the pub. Peter described that when he started working with them he felt that he needed to *'fit in'* with his work mates. He started going out with them most nights and drank to drunkenness because that was the *'routine'* of this group.

"We started going out together to socialize and to know each other better. Every night after work we'd go out to a pub across the road and get in for free because we were staff. We'd always drink there until 4 in the morning and do the same the next day"

Similar to Sam who rejected the norms of some of his school friends as has been described earlier, Peter chose to reject the norms of these workmates. He described that since he met his boyfriend, he has distanced himself from them because he believes that they indulge in the drink excessively and have very unhealthy life styles. He recalled that he was *'mocked'* and

'slagged' when he stopped drinking with them but he did not give in. Now they don't meet up unless it is to go out which is not very often. Peter described that person 23 feels the same way towards them and does not go out with the girls as much as she used to.

"I did that for a few months. I had my phase of drinking all the time because I was going through a break up but now I am past it. I still get on great with them but I wouldn't be as close to them because the only way to get close to them is to go drinking with them and I don't want to do that anymore"

The fact that Sam dissociated himself from his childhood friends and Peter found himself distancing from his work mates because they no longer preferred these friends' drinking norms, reflects how dynamic and fluid network associations can be. It is well known in alcohol use literature that sometimes people become friends with each other because of similar drinking behaviours (Ennett and Bauman, 1994). The above finding draws attention to a different process – that of people rejecting old friendships or consciously reducing them because they have dissimilar drinking behaviours. Although this is a relatively uncommon phenomenon, it happens in youngsters' lives and warrants further attention.

The second clique in this network is formed by Peter's college friends (persons 24 and 25), his boy friend (person 22), his work mate/flat mate (persons 23) and a friend he made randomly on a night out (person 29). Of these friends, persons 22 and 23 overlap between cliques 1 and 2. Peter has known his college friends for two years. He used to go out with them a lot but since he has met his boyfriend, he chooses to go out less often. Peter feels that these friends drink a lot. He described that he used to go out with them a lot when he was recovering from a bad relationship. They used to drink twice a week and get 'wasted'. However, since he has met his boyfriend, he only sees these friends in college and does not socialize with them as much as he used to.

The third clique is formed by Peter's family and his boyfriend. Among family, Peter mentioned his parents and an aunt who is her mother's sister. He described that his mother and his aunt do not drink alcohol and disapprove of it completely. Peter feels that this is because their father was an alcoholic and their husbands (Peter's uncle and his dad) also have issues with alcohol. Peter described that his father (person 212) used to be an alcoholic and that even now his addiction often relapses. He still drinks every day which often leads to unpleasant arguments between his parents. Peter described that he does not feel like discussing anything important with his father nor does he feel very close to him. In fact he finds himself unable to forgive his father for some of the experiences which he had to go through as a child because of his father's drunkenness. Among his family, Peter feels closest to his mother and his aunt and discusses personal issues with them. However, since Peter does not live at home, he interacts with his mother and his aunt less frequently than he does with other members in his network.

Peter's boy friend (person 22) overlaps between all three cliques in his network. It means that he knows most of his contacts. He is 11 years older than Peter and the two of them met at a pub less than a year ago. Peter feels very close to him. He described that person 22 has moved to another country for a year in relation to his work. However, they talk every night and visit each other every month by travelling back and forth. Peter feels he can discuss anything with person 22 and often seeks his advice on work related matters. He described that person 22 might have drank more when he was younger but now he is a moderate drinker who drinks twice a month and '*very rarely*' drinks to excess.. Peter feels person 22 has been '*a very good influence*' on him because he has '*tamed down*' since he met him. He described that he socializes with his boyfriend in non drink related ways and that they prefer to go to restaurants most of the times rather than pubs and clubs.

“I think we are really good for each other because, I wouldn’t really know when to stop before I met him. Now he is always there to tell me ‘I think you’ve had enough’ in a nice way so that I don’t get all fluttered cause when you drink you always get ‘Ah I didn’t drink enough’. I used to drink much more before I met him but I think I have changed. He doesn’t agree with drinking to get drunk whatsoever. He just thinks it’s stupid and ridiculous and that’s why he doesn’t let me do it and I agree with him when I am sober”

Peter’s survey response suggests that he perceives his proximal peers to drink to drunkenness 2-3 times a month and consume 3-4 drinks on an occasion. These perceptions correspond closely with the drinking behaviours of persons 22 and 23 who are very salient in this network. They appear in both his important discussants’ and ‘socializing networks. Peter interacts with them regularly, shares inner thoughts with them and seeks their advice and opinion on matters of importance. Peter’s own drinking behaviour is very similar to that of his boyfriend and appears to be influenced by him. It is clear from his interview that though he has known him for less than a year, he chose to change his drinking behaviour after having met him and feels that his boyfriend has been a good influence on him in this regards. It is also clear from the visualization, that the most salient nodes in this network are embedded in cohesive sub groups outside of college.

8.3.2 The ‘Group’

8.3.2.1 Lisa’s Network

Lisa is a 20 year old heavy drinking participant. Her network is shaped like a group.

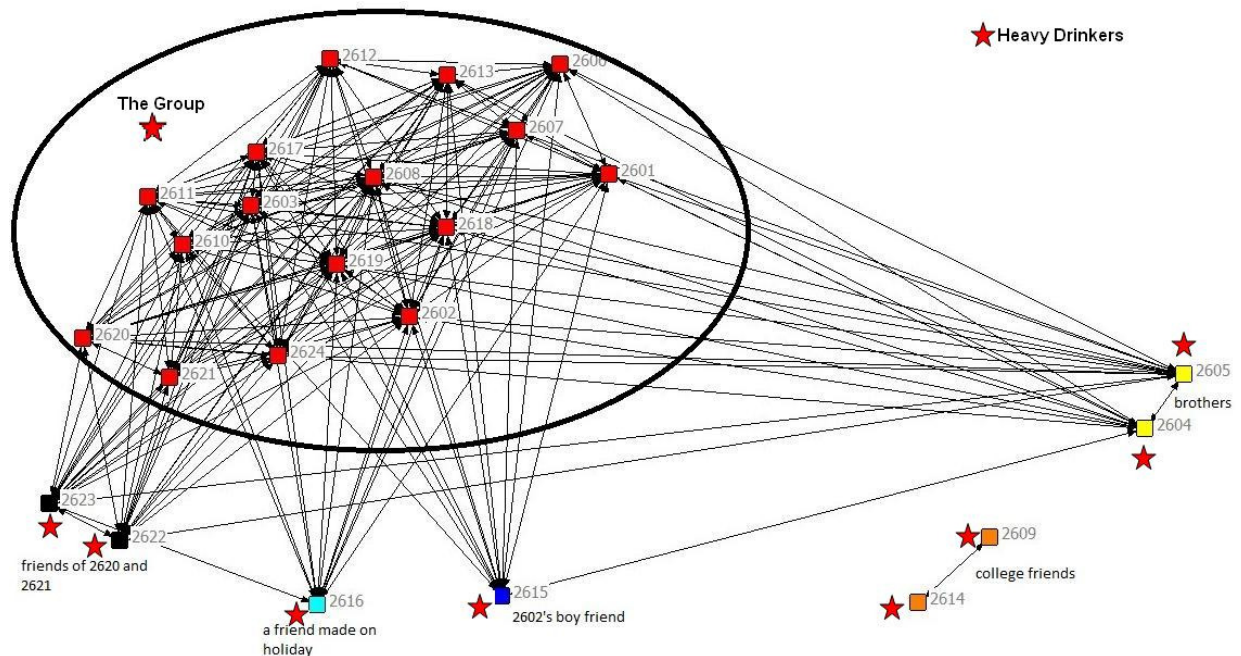


Figure 24: Lisa's overall network

The heavy drinkers in this network are identified by a 'red star' in the visualization. As is evident, everyone in Lisa's network drinks heavily.

As described in chapter 7, section 7.6.3; the most salient ties in her network are embedded in the 'group' of 16 friends encircled in black in the above visualization. They all live in the same general area. The 'group' has been central in Lisa's life since early teens. It was in the company of these friends that Lisa began drinking. She was 13 years old at the time. In their teenage years the 'group' would usually drink at parties and get-togethers because they were underage to go to pubs/clubs. Lisa recalled that drinking has been a 'central' element of socialization within the 'group' since their teenage years and continues to be so. It appears from her interview that over the years, the 'group' has developed very specific drinking behaviours and attitudes to which everyone conforms. For example, they all drink similar

beverages in similar amounts and in the same manner which Lisa described as *'the standard way'*. She described that heavy drinking is not only common but also almost *'taken for granted'* within the *'group'*.

"If we are going out and someone's not drinking, eyebrows would be raised, we'd be like why not. If someone wasn't drinking they wouldn't come with us and it'd be for a reason, it wouldn't be just because 'I don't want to'. It'd be because I have work tomorrow or I have no money. It would never be like 'O I just don't want to'. So drinking is a big factor in our going out. We usually have a naggin²⁷ of spirits before we go out and 1 or 2 drinks in the club. That's the standard. Drinking a naggin a week is quite a lot. We don't think that we are massive alcoholics but we know that we drink more than we should"

She described that they always drink pre-purchased alcoholic beverages in a *'pre-drinking session'* in their area before heading out to the licensed venues in town. Lisa and her friends think that it saves them money. It appears from her interview that a typical night out is aimed at getting drunk. Lisa's description also indicates that social pressures exist within the *'group'* to conform to the drink related norms and expectations.

"Usually when we go out, we would pre drink in our area. If we are in rush for the train we'd just down our drink, get on the train and then we'd want to be drunk for the rest of the night. If you are going out and you are going to be drinking then you'd want to be drunk rather than feel that you wasted your money on drinking and you are not even drunk. So yeah most times when we go out we'd drink to get drunk"

²⁷ A naggin of spirit is equivalent of a 200ml serving (6 standard drinks) - (drinkaware.ie)

She also described that drinking is encouraged in the ‘group’ in the form of drinking games which form a regular feature of pre drinking sessions in the ‘group’.

“When there are a few of us we play ‘kings’. You have a cup in the middle surrounded by cards. You have to flip over a card and do what the card says. If you are the last to do whatever that card says then you have to drink and if you get a king card then you have to pour some drink into the cup and the last person to get the 4th king has to down the king cup. It’s like a mixture of vodka and beer. We play that a lot, you just have to (laughs)”

Within the ‘group’, Lisa has a sub group of friends (comprising persons 2601, 2602, 2606, 2607 and 2608) with whom she spends most of her free time. She drinks with these girls twice a week, relies on them for advice and emotional support and never goes out without them.

Outside the ‘group’, Lisa has two college friends who she has known for only a few months. It appears from her interview that Lisa does not go out with them often and that most of their activities are college based. She described that she does not have much idea about their drinking behaviours because they usually drink within their own circles of friends outside college. Lisa however feels that their drinking habits are similar to those of her own friends because they often appear ‘*hung over and tired*’ in college after a night out with their friends and tell her how ‘*drunk*’ they were the night before.

“When we chat I know they go out and that they would drink to get drunk as well. They would imply it when they tell me that they went out last night or what happened. I don’t know how much or whatever they drink but I think they are like me and my friends”

Of family, Lisa only mentioned her brothers. Lisa’s two brothers also drink heavily. Of them person 2605 is still under age. Yet, it appears from Lisa’s interview that he drinks every week

and consumes up to 10 standard drinks or more on a single occasion. He is a rugby player and knows many people who are older than him. He is not old enough to go to clubs and pubs but he drinks with his older friends at house parties and sports get-togethers. Lisa never drinks with him.

Lisa did not mention her parents in either of the name generators however it appears from her interview that unlike her and her siblings, they drink only on special occasions.

Lisa's survey response indicates that she perceives her proximal peers to drink to drunkenness twice a week and have 9-10 drinks on an occasion. These perceptions correspond closely with those of the cohesive 'group' of school friends. Her own drinking behaviour matches closely with that of 'the group'. It appears from her interview that she prefers to enjoy nights out with her closest friends in the 'group' and derives fulfilment from her relationship with these girls. These girls namely persons 2601, 2602, 2606, 2607 and 2608 are the most salient in her network and also appear to influence her behaviour by regularly reinforcing heavy drinking in social situations, associating it with the 'group' and expecting each other to engage in it.

8.3.2.2 Ken's network

Ken is a 20 year old participant who drinks moderately. He named 17 people in all of which 11 were males and 6 were females. Ken's network is also shaped like a 'group'.

The tie strength scores for this network are presented next. The nodes enclosed in the parenthesis overlap between Ken's 'important discussants' network' and his 'socializing network'.

Tie Strength Scores	Alters
6	(2501)
5	2504, 2512, 2513, 2514
4	2502, (2505, 2506)
3	2503, (2508) , 2510, 2515
2	2507, 2509, 2511, 2517
1	2516

Table 41: Tie strength scores for Ken's network

Ken's network is shown in Figure 25. The 'group' in this network is encircled in blue. In addition to the group, Ken's network includes a clique (encircled in green) of family members comprising his parents, siblings and two cousins. It's a predominantly male network.

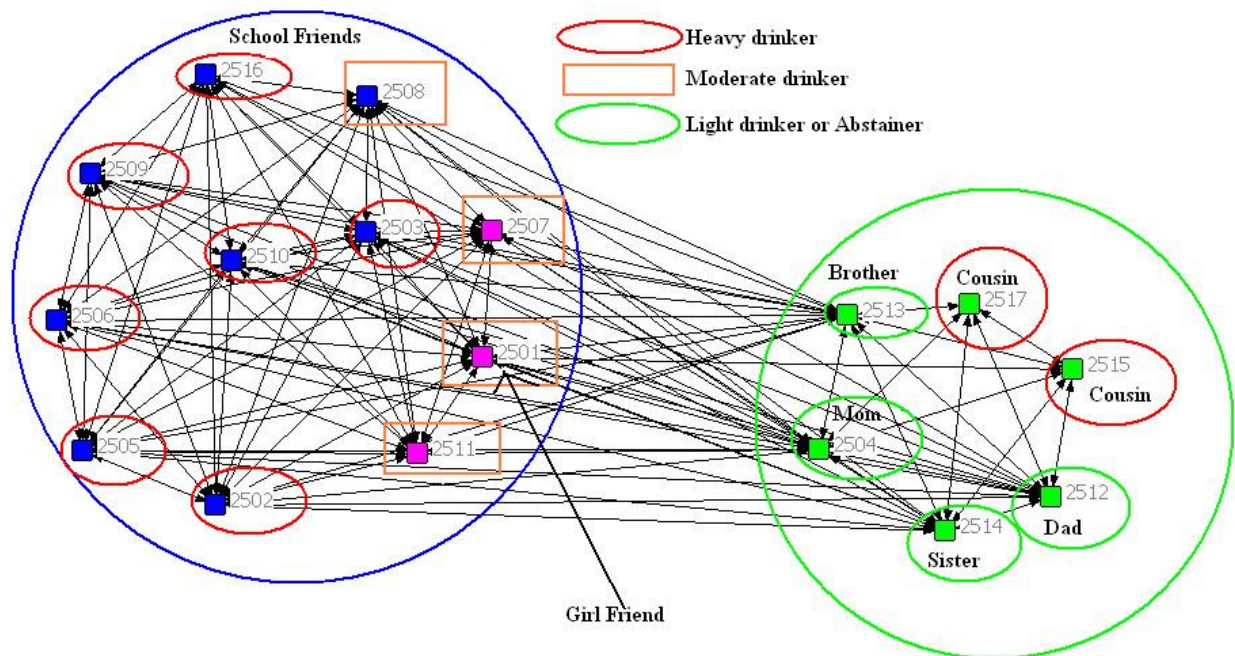


Figure 25: Ken's overall network

The 'group' in this case comprises Ken's girl friend (person 2501) and 10 friends who he knows from school. They all live in the same general area. Ken has known most friends in the 'group' for over 10 years. The only exception is his girl friend who he has known for a year. However, she is well integrated into Ken's wider network and knows all his school friends as well as his immediate family. She is part of the 'group' because she socializes with Ken and his school friends regularly in both drink and non drink related ways.

Ken and his school friends socialize through several shared activities such as playing football, music and drinking. As a group, they often hang out in each others' houses to watch movies, play video games or just to talk and drink. Ken is also involved in a music band with some of his school friends which include persons 2503, 2505, 2506, 2508, 2509 and 2510. He feels that music connects them. Of his school friends, he feels closest to persons 2502, 2505, 2506 and 2508 who he has known for 16 years. Ken feels that he can confide in these friends about private matters and seek their advice.

The 'group' means a lot to Ken because he grew up with these friends. He interacts with these friends every week and relies on them for social companionship as well as emotional support. Ken began drinking in the company of the 'group'. He was 15 years old at the time. During the interview he recalled that he and his friends did a lot of heavy drinking in the early years. Ken described several instances from his teenage years when his friends ended up doing things they later regretted as a result of being drunk. He recalled that in the earlier years, it was '*really difficult*' to avoid drinking in 'group' situations because his friends '*relied*' on drinking to socialize.

It's almost isolating yourself if you are not getting involved. It's very hard for all my friends to get together at one place without alcohol being involved. There's a pressure and a huge emphasis on drinking apart from family really. One of the first questions you'd be asked when you are out is 'are you drinking'.

Most of the people in the 'group' still drink heavily (encircled in red). It appears from the interview that those who drink moderately also engage or used to engage in episodes of heavy drinking from time to time. Ken described that 'drinking to get drunk' is considered as a 'normal thing to do' among his friends and no one really disapproves it.

Of all the network members, Ken feels closest to his girl friend (person 1501). While he sees the 'group' at least once a week, he interacts with his girl friend on daily basis. They spend their free time together in each other's houses watching movies, cooking food and talking. Ken described that they have gone on several trips together. At the time of the interview, Ken and his girlfriend were planning to go on a holiday together. He feels that they don't keep anything from each other and can openly talk about their troubles and personal issues. Whenever Ken socializes with his school friends, his girl friend is usually there as well.

Ken's parents abstain from drinking alcohol and his siblings only drink occasionally, yet Ken began drinking when he was still underage and continued to drink heavily through secondary school. This reflects that Ken's family does not influence his drinking. Ken never drinks with his family. His siblings are several years older than him. He recalled that his brother used to drink heavily in teenage years now he only drinks on occasions. His cousins are also heavy drinkers but Ken never drinks with them either. They live in different towns and Ken only communicates with them through social networking sites.

It appears from the interview that Ken's drinking behaviour changed after he met his girl friend. For example he feels that his drinking has '*reduced*' because of her. Ken described that he used to drink heavily at least once a week with his school friends before he met her. Although he did not like to drink heavily, he relied on his friends to socialize and spend his free time with. Ken feels that there was always '*an unspoken pressure*' to drink heavily.

"When you hang out with big groups of lads like me, you drink a lot because not having a drink in one's hand is almost looked down upon. It was an understood thing"

Ken described that when he was single, it was harder to say '*no*' to drink because one needs to go out to meet potential partners.

"When you don't have a girl friend you rely more on your friends' circle because you have to go out with your friends to meet someone in the first place so you do what your friends do and you need to go out to the pub and you do the usual pub and the club and drink and then go home at 3 o'clock in the morning. That was just the general routine in my case"

After meeting his girl friend, Ken felt he didn't need to drink as much. He still sees his school friends once a week and enjoys watching movies with them and playing sports or music. However, he only drinks with them once a month because he prefers to spend most of his time with his girl friend doing '*non alcoholic evening activities*' because she does not like to drink as much as his other friends.

"I probably drank more before I met her. When we are together we don't drink unless we want to go to a pub to have cocktails or something nice taste wise which would be twice a month at the most. We don't ever feel the need to go out drinking together. We are just happy just like staying in and doing something non alcoholic"

Ken's girl friend does not approve 'drinking to get drunk and thinks that it is *'stupid'* to do so. He described an incident when he had gotten drunk by accident and his girl friend had been extremely angry at him. Ken feels she has been a positive influence on him.

Ken's survey response suggests that he perceives his close friends to drink to drunkenness once a week and consume 7-8 drinks on an occasion. These perceptions correspond closely to the drinking behaviour of most of his school friends who drink heavily. His survey response also suggests that he perceives his best friend to drink '2-3 days a month' have '3-4' drinks on an occasion and never get drunk. These perceptions correspond closely with the drinking behaviour of his girl friend. There was a time when Ken's drinking behaviour was similar to the 'group' and he felt pressurized to drink like them. However, it is clear from the interview that his current drinking behaviour is very similar to that of his girl friend and appears to be influenced by her. She is also the most salient person in his network and embedded in the 'group' which is still very important to him and holds a central place in his social life. It is also interesting to note that though Ken has been in college for 2 years, he did not name any friends from college in his important discussants' or socialization networks. This reflects the social fulfilment he derives from the 'group'.

8.3.3 Core/Periphery

8.3.3.1 Gary's network

Gary is a 23 year old participant who drinks heavily. Gary's network which resembles a core/periphery type structure is reproduced in Figure 26.

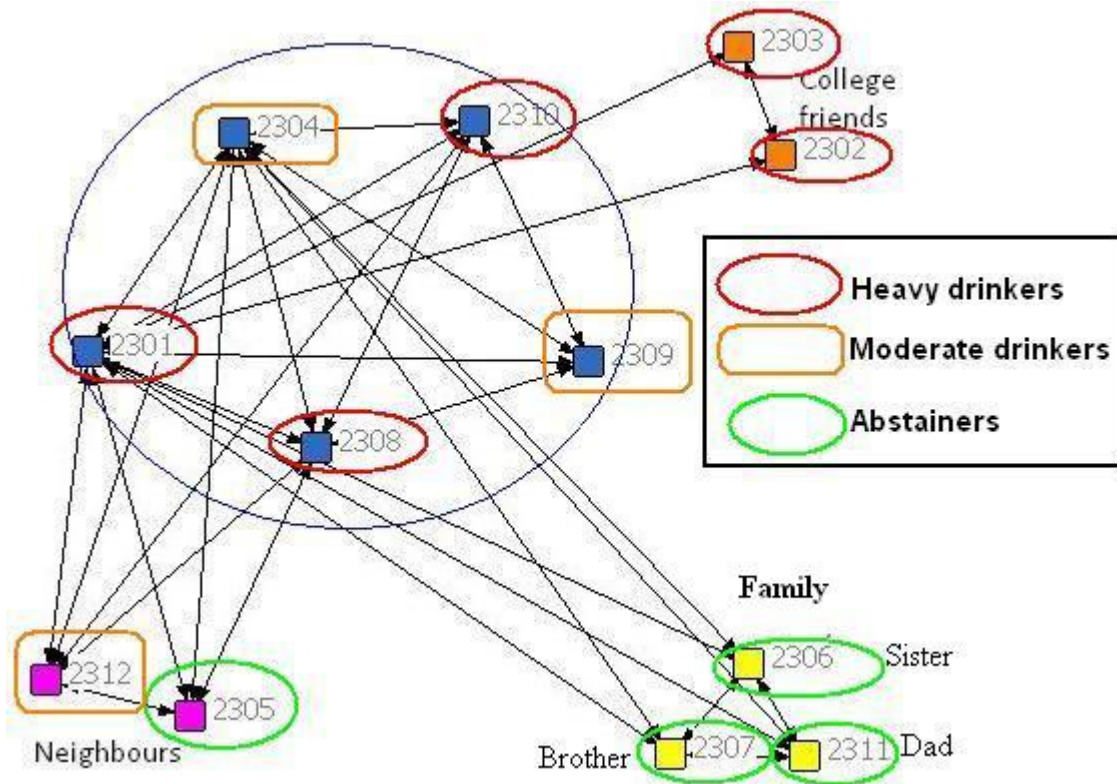


Figure 26: Gary's overall network

Gary belongs to a family (yellow nodes) where most members abstain from drinking alcohol or do so only occasionally whereas he himself is a heavy drinker. During the interview he described that both his grand fathers were alcoholics. His parents have seen some very hard times as young adults and decided to completely abstain from alcohol when they had their first child – Gary’s sister (person 2306). They haven’t drunk alcohol in 30 years and strongly oppose heavy drinking. Both his siblings drink only occasionally. Gary described his elder sister as very ambitious and career focused. His younger brother does not like the idea of ‘drinking’ and Gary feels that his grandfather’s alcoholism has affected his brother deeply.

“I think that had a direct effect on my brother. He has only met my mum’s father who spent all his money in the pub. My brother saw him drunk several times and I can only imagine that put

him off. It didn't have much of an effect on me, I don't really know why but it did on him. My sister doesn't drink because she is always doing something, she always has to be up early and drinking is not an important part of her social situation"

Gary thinks that his brother does not make any friends because he does not like to drink. He believes that the opportunities to make friends and socialize in the Irish culture are '*dramatically reduced*' if one does not drink because there is '*no point of coming out on a night out if it is not for drinking*'. Gary is the only person in his family who drinks. He started drinking when he was 13 years old.

Gary's network is shaped like a 'core/periphery' where the core is formed by 5 male friends encircled in black in the visualization (persons 2301, 2304, 2308, 2309 and 2310). As has been described in chapter 7, section 7.6.4, these are the most salient ties in Gary's network. Further, of all network members, Gary drinks with these lads the most frequently. Person 2304 is one of Gary's best friends from school whom he has known for 10 years. He has a steady girlfriend (person 2312) since he started drinking. Gary described that person 2304 does not like '*drinking to get drunk*' because he usually prefers to remain in control on nights out and return home with his girlfriend while he is still '*sober*'. Gary does not drink with him as often as he would with the other friends in the core because person 2304 has a busy job and a different circle of friends with whom he likes to drink. However, they usually meet up at least twice a month and drinking is usually involved on these occasions.

"Person 2304 is a completely different kind of friend. He's been going out with person 2312 for many years. He knows my group of friends but he doesn't go out with them. He lives 15 minutes from us, works full time and crazy hours. When he does have time off he likes to have a few beers with his own friends. But I'd never go to his house and not have a few beers. It's just the culture that we live in. No

matter what, everybody seems to have alcohol with whatever they do. I plan seeing him on Sunday for a match because we are both big American football fans, I am sure we'll have a few beers while we do it"

Gary usually drinks with persons 2301, 2308, 2309 and 2310. They always go out together as a group. Gary described that while these friends drink different amounts on a night out; it is not unusual for them to engage in episodes of heavy drinking from time to time. For example Gary described a time when persons 2301 and 2310 went through phases of heavy drinking after breaking up with their girl friends. It appears from his interview that *'drinking to get drunk'* is considered as *'normal'* in his group of friends.

"I don't think anybody would really have a problem with it. It's normal. We've all had experiences about it where you get out of control and wasted, you don't know the one that's one too many"

Among these friends, person 2308 drinks the most. Gary described that he *'drinks to get drunk every night'*.

"He is always drunk when we go out. Every night he goes out and he'll drink crazy amounts which he can't handle and won't remember a lot of the stuff the next day. If there is a sign of a party, no matter who gives it, he'll go. He rarely takes a night off"

It also appears from his interview that while as friends, they look out for each other on nights out and never leave each other alone when they are drunk yet they do not intervene when someone drinks heavily. Gary feels that it is *'unnecessary'*.

"If somebody wants to get wasted you let them do it, it's their life and who are you to stop them. It's quite common. We've all done that. You may advise them differently if they are a really (stresses) good friend or a family member but again it's not your place to step in"

As has been described earlier in chapter 7, these friends are part of a wider group of lads who Gary has become friends with through person 2301. During the interview, Gary described that he has a group of 12 friends of which he mentioned these 4 because they are his closest friends. They go out every week and sometimes more frequently if their schedules allow

“We have a page on Facebook just for our group of 12 friends. It’s a lot of person 2301’s school friends and the friends that we have from rugby. We all have the same interests, we all play foot ball and go out together. It’s very male orientated. Every now and then somebody would go ‘does anyone fancy a pint’ and some people will reply and we’d go down to the local pub because it’s close enough. We all live in close proximity to each other”

Gary started going out with this group some years ago. He recalled that in the beginning he was very shy and reserved and found himself spending more time drinking rather than engaging in conversations with them. Then he and person 2301 went on a holiday together with some of the lads after which their friendship strengthened.

Of core friends, Gary described person 2301 as his best friend who he has known for 15 years. They started drinking together. Gary described that person 2301 was introduced to beer by his father who works as a bar man. Both Gary and Person 2301 began drinking together and drank heavily through school years. Both were involved in rugby which Gary describes was closely related to drinking.

“We played a lot of rugby in school and it’s just one of those sports which go hand in hand with drinking. If you’re involved in it you’ll know how it is. So we did a lot of drinking in school”

Gary recalled that there were several instances of ‘not remembering the night’ and ‘getting sick’.

“When we were younger, I, person 2301 and a lot of other people didn’t know when to stop. A lot of the times, we’d keep drinking and then there’d be like a switch that’d go and then we’d change and wouldn’t be ourselves and wouldn’t probably remember anything after that point”

Gary and person 2301 drink in the company of other friends as well as when they are on their own. Gary recalled that he *‘never goes out without him (person 2301) whether it is to watch a match or a night out’*. He further described person 2301 as his *‘drinking buddy’* on a night out when they keep up with each other and drink the same amount of alcohol.

Of the peripheral friends, person 2305 is an abstainer. She plays a lot of sports and does not engage in drink related activities. Person 2312 drinks within her own circle of female friends. Gary does not drink with her specifically.

The two people from college are friends he made while he was in Spain for Erasmus. Gary has only known them a few months and only meets them in college. They are heavy drinkers but Gary feels that they know their limits. His perceptions of their drinking are largely based on the three months that they spent together in Spain. Gary described that the lads had built up *‘a lot of tolerance for alcohol’* because they lived in an area which was very focused around drinking. On the other hand, Gary lived with people from different nationalities in the first few months. Their cultures were not as permissive about drinking as is the Irish culture. Gary recalled that he had to reduce his drinking *‘out of necessity rather than desire’* during this time. During the last month of his stay in Spain, person 2301 visited Gary. He recalled that they spent most of their time doing drink related activities and visiting various pubs and club.

Gary’s survey response suggests that he perceives his proximal peers to drink to drunkenness at least twice a week and drink 9-10 drinks on an occasion. These perceptions correspond

closely with the drinking behaviour of the majority of his core friends who drink regularly and heavily. Gary's own drinking behaviour is very similar to theirs. It is clear from his interview that Gary mostly drinks with his core friends, that they often engage in heavy drinking and that they reinforce it in social situations. It appears that of these friends, person 2301 is the most salient and influences Gary's drinking the most. They began drinking together, drank heavily all through school years and continue to do so both in group situations as well as when they are together by themselves. Gary never drinks without him and they drink similar amounts whenever they go out. It is also clear that his peripheral contacts do not influence his drinking as many of them are abstainers and those who are heavy drinkers are recent friends with whom Gary drinks very rarely. It is apparent that the most salient and influential people in this network are embedded in the core which exists outside of college. It is also interesting to note that though Gary has been in college for 4 years, he only named two people from college who he has known for only a few months.

8.3.3.2 Linda's Network

Linda is a 19 year old participant who drinks heavily. Linda's network is shaped like a 'core/periphery', where the most salient people in her life are embedded in the core as described in detail in chapter 7, section 7.6.4. Unlike Gary's network where the core comprised 5 male friends, Linda's core contacts are diverse and include her parents, cousins, school friends, boyfriend and a work mate. Most of the peripheral friends are people she came to know through her core contacts. Linda did not name any college friends in her network though she has been in college for a year.

Linda's network is reproduced in Figure 27 in which the core is encircled in thick black and the peripheral friends are encircled in thin black.

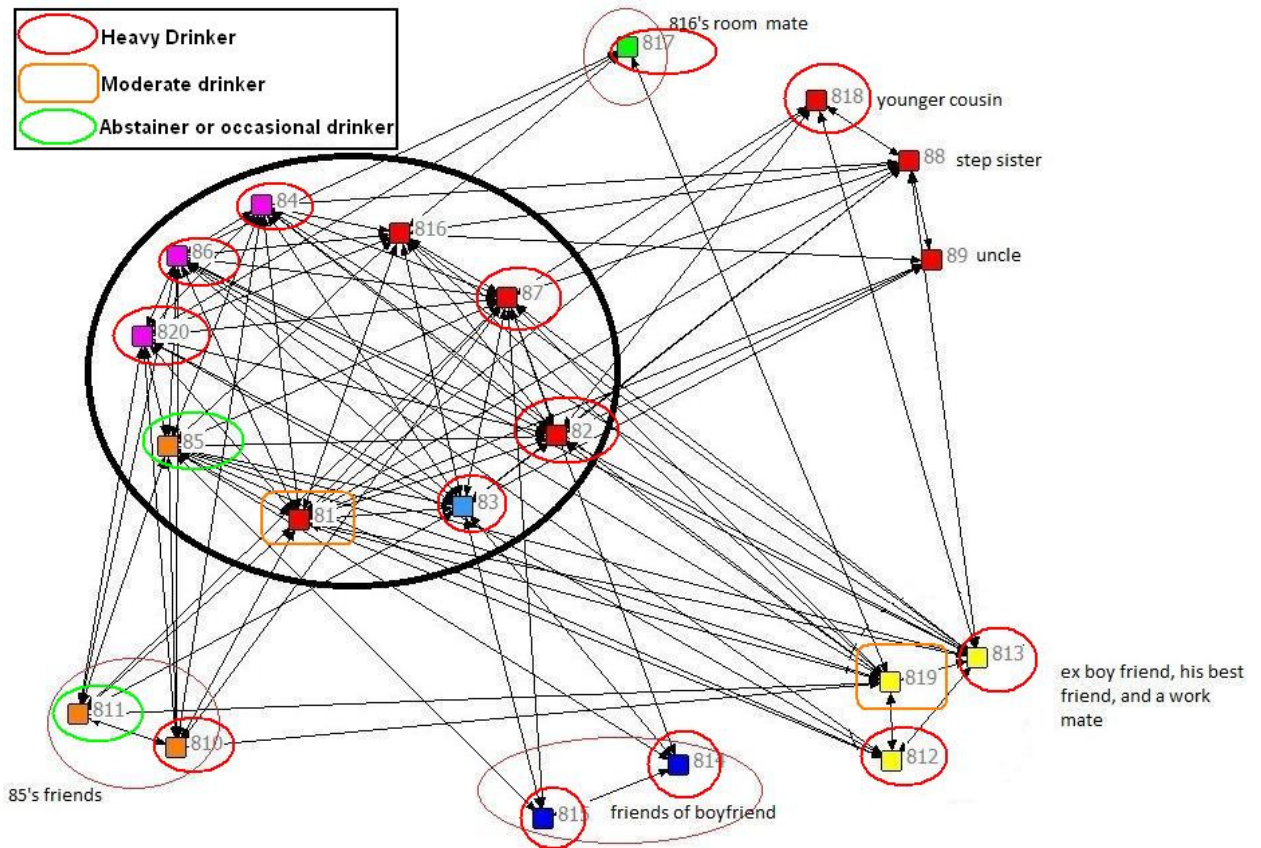


Figure 27: Linda's overall network

Linda's interview suggests that most people in her network are heavy drinkers (encircled in red) like herself. As will be discussed, there are several people in her network with whom she became friends through '*drinking*' such as persons 810, 811, 812, 814, 815, 819 and 820. Most of these people are her peripheral friends.

Linda started drinking when she was 17 years old. She recalled being introduced to different types of alcoholic beverages by her parents (persons 81 and 82) in a '*very controlled*'

environment. Her parents would encourage her to try different drinks at home and to learn to pace herself while she drank. She described that this helped her *'know her cut off point'* at which she usually stops drinking. She described that both her parents drink in moderation, however, recently there have been some episodes when her father returned home drunk during the week. This has led to some arguments at home which Linda finds *'unpleasant and out of the ordinary'*. During the interview, she described that every Friday she and her parents enjoy a quiet evening at home where they have drinks with dinner followed by dancing. Her parents would put on their wedding song and dance to it. Linda described these evenings as very *'enjoyable'* and *'relaxing'*. This is the time when they socialize together as a family, discuss their problems and engage in light hearted conversation.

Person 87 is Linda's cousin who is three years older than her. Linda's earliest recollections of drinking outside her home involve this particular cousin. She introduced Linda to drinking in clubs/pubs and taught her to dress up and put on makeup. Person 87 drinks heavily and Linda feels that her cousin *'influences'* her to drink more than she should on a night out. She recalled an occasion when she had gotten *'terribly drunk'* after a night out with her cousin. Her father had been very angry and upset at her cousin for getting Linda drunk and *'influencing'* her.

"When I was 17 we started talking more because I was starting to go out then. She would take me out and show me what to drink and how to do it. My step dad thinks she is a bad influence on me when drink is concerned because I wouldn't be technically a heavy drinker. When we go out together she's always like 'Let's do shots' and we'd be mixing drinks. She would drink most guys under the table and I'd try to keep up with her"

Linda drinks with person 87 at least twice or thrice a week. It appears from her interview that these occasions frequently involve drinking excessively where Linda feels pressurized to drink. She described that person 87 often *'pokes fun'* at her if she does not keep up with her and encourages her to *'continue drinking'* even when she feels she should stop.

"She is always encouraging me to keep up with her. If I don't she is like 'O, you scary cat, why aren't you drinking, go on'. Two years ago, we were drinking in the house and playing a drinking game. I said 'O I need to slow down' and she was like 'But I am over, you must keep drinking' and I felt like 'O yeah I should be ok, I'll feel fine if I just keep drinking' and then I was just completely drunk. I should have probably stopped a long time ago but I didn't, I was like 'O, She is still standing, I'll be ok too'

Person 84 is Linda's school friend with whom she grew up. Linda recalled that as kids they used to have *'weekly sleepovers'* in each others' houses. Now they have different friends. However, they have a *'girls' night'* every month when they *'drink'* and *'catch up'* with each other. Linda feels that person 84 did not use to drink as much as she does now. She thinks that her friend has gotten into the company of a group that drinks a lot all the time. On a typical night Linda and person 84 usually have up to two full bottles of wine²⁸ before they head out to the night clubs where they would drink more.

Linda works with person 85. She described that persons 85 and 810 are best friends with each other and used to be heavily involved in *'underage drinking'* as teenagers.

²⁸ A full bottle of wine is equivalent of a 750 ml serving (7.4 standard drinks) Hope, A. (2009). A Standard Drink in Ireland: What strength?, Health Service Executive - Alcohol Implementation Group.

“She and person 810 used to bring the drink into school and actually drink in school. To me that’s seems extraordinary. They used to go out and intentionally get drunk”

Linda described that person 85 would often end up ‘losing her clothes’ and ‘do crazy things’. Over the years, she has realized that she does not know her limit which is why she now abstains from drinking alcohol completely. Linda still goes out with her every week to dance. Person 86 who is Linda’s school friend as well as her work mate also usually accompanies them. Linda described that she too is a heavy drinker who drinks to get drunk and can be a ‘burden’. More recently, Linda and person 85 have stopped going out with her because they felt they had to ‘baby sit’ her, each time she drank. Linda described several occasions when they had to ‘hold her hair while she threw up somewhere or take her home and put her to bed’. Persons 810 and 811 who are Linda’s peripheral contacts are the people with whom she became friends through person 85. They are person 85’s best friend and boy friend respectively and Linda met them on a holiday on which they all had gone together. Person 811 is an occasional drinker and Linda does not drink with him. Person 810 on the other hand is a heavy drinker whom Linda described as her ‘drinking buddy’ on the holiday.

“When we were on the holidays, I and person 810 were drinking buddies and dancing buddies and we were like ‘let’s party this place and that place’. He is very extrovert which is a good attitude to have whereas I’d be a bit shy. We drank a lot together and it was so much fun”

Linda, person 85 and her friends often socialize together once a week on nights out.

Of all the network members, Linda drinks the most frequently with person 83 who is her boyfriend. He is 7 years older than her. As described in chapter 7, they met on a pub crawl where they became friendly. Linda recalled that he had bought her drinks all night. It appears

from her interview that person 83 loves partying, drinks heavily throughout a night and encourages others to do the same by buying them drinks. He is *'admired'* among his friends for his *'always party'* attitude towards drinking. Linda described that when she first started socializing with his circle of friends, they'd tell her that *'she hasn't partied with anybody till she parties with person 83'*

"He is lethal. When he gets going there is no stopping him. We went out a few weeks ago with 8 people and he bought everyone around five rounds of Jagerbombs within the space of three hours (sounds impressed). He is such a different person who keeps saying 'we are having a good time, let's just keep on drinking' and that's his attitude. If everyone is having a good time he buys everyone a drink. He has bought a round of drinks for people he doesn't even know.

He gets drunk obviously but he also gets others drunk (laughs)"

Linda drinks with him at least twice a week. They drink both in the company of other friends as well as when they are by themselves. It appears from Linda's interview that her boyfriend's attitude towards drinking and partying *'prompts'* her to drink excessively. For example she described that she always *'drinks beyond her cut off point and gets hammered'* when she is out with him. She recalled several occasions when she felt she should have stopped drinking but she didn't because her boyfriend kept buying her drinks in *'the swing of having a good time'*. She also explained that she has stopped buying drinks for herself because he does it for her. Some of her peripheral contacts are person 83's friends who she became friends with through nights out. These are persons 814 and 815. They too are heavy drinkers and Linda feels that their drinking is influenced by person 83.

I think they are more influenced by person 83. When they are together are they just want to have a good time. They have a 'if we get drunk well then we get drunk, it's great' sort of attitude. .

Linda drinks with them whenever she socializes with her boyfriend's circle of friends. She does not see them otherwise.

Person 820 is a friend Linda made 4 years ago. He was going out with one of her school friends at the time and Linda was introduced to him on a night out. Linda is still friends with him and interacts with him frequently. Linda described that when she was underage, he used to help her get into night clubs.

"I met him at a party when I was 17 and still underage. He was heading off to a local night club and he said 'come with me' and I said 'I won't get in, I am only 17', he was like 'O I know the bouncer, I know everybody, cling to me, you won't even be asked for an ID' and he got me in"

He and Linda live close to each other. Linda described that whenever she feels like sitting in the local for a while and have a few drinks, she sends him a text and he joins her. They socialize in this way regularly.

Of the yellow nodes, person 813 is her ex-boyfriend. Linda has known him for 3 years. When she started going out with him, he didn't drink much. Linda described that his parents are pioneers and he wasn't *'really taught how to drink'*. Linda introduced him to drinking and taught him about different types of drinks. She however feels that he cannot pace himself very well because of which he get drunk almost every time that he is out.

“The first time I brought him out, we were just buying pitchers. I had stopped drinking because I knew my limit whereas he was this guy who is 6 ft 4 and he was on the floor while I was still there because I was pacing myself. He was just downing it like coke or 7up. Any time that we’d go out drinking he would just get plastered”

Although they are not in a relationship any more, they go out with work friends. Linda used to accompany him to his ‘goth club’ every week when they were together. They sometimes still go there. Linda described that the club is a great place to meet different people and that she and person 813 often end up going to someone else’s house at the end of the night where the party would usually continue well into the morning hours.

Person 812 is her ex’s best friend. Linda drinks with him frequently and describes him as a ‘party animal’. He drinks several times a week and Linda feels that he is ‘fun to hang around with’. Person 819 is another work mate who drinks moderately. He and Linda get to spend half an hour together after work while they wait for their buses. During this time, they try out the local pubs where they have a few drinks. Linda described that they do this regularly and take turns in buying drinks each week. They also try to organize nights out at work.

Person 818 is Linda’s younger cousin. Linda introduced her to drinking, make up and boys just like person 87 did to her. Linda recalled that she would take her cousin to parties and sneak her in the night clubs because she would look older than she was. Linda does not drink with her very frequently but feels that person 818 drinks to get drunk from time to time.

Linda does not drink much with person 816 who is her cousin nor does she have much idea about her drinking habits.

It is clear from the functioning of Linda's network that drinking is a key element of her socialization with friends. She also drinks regularly with her parents though not as much as she does with her friends. It is interesting to note, that she tends to be friends with people who are older than her. Her survey response indicates that she perceives her proximal peers to drink to drunkenness twice a week and drink 7-8 drinks on an occasion. These perceptions correspond closely with the drinking behaviour of most friends in her network whom she described as 'heavy drinkers'. Although she drinks heavily, Linda does not consider herself to be a 'heavy drinker'. For example, she described that she is not '*technically a heavy drinker*' and talked about how she always '*paces*' herself and knows her '*cut off point*'. However, it appears from her interview that she does drink heavily and engage in heavy episodic drinking from time to time. It is also clear that she responds to normative pressures to drink by trying to '*keep up*' with other friends and drinking more alcohol in the company of friends who favour and encourage heavy drinking (such as her boy friend-person 83 and her cousin-person 87). Although Linda's boyfriend did not know her before she began drinking, it is evident from her interview and the above discussion of her network that she feels compelled to drink to drunkenness when she is in his company. While Linda seems surrounded by people who drink heavily, it appears from her interview that she feels especially compelled and encouraged to drink heavily when in the company of her boy friend and her cousin (person 87). Both persons 83 and 87 are embedded in the cohesive core, are very salient to her and she drinks with them on regular basis.

8.3.4 Contextualized Network

8.3.4.1 Ruth's network

Ruth is a 22 year old participant who belongs to the low drinking cohort. It appears from her interview that most people in her network are light drinkers, especially those who are the most salient to her and with whom she usually drinks. These people have been encircled in green in the following visualization.

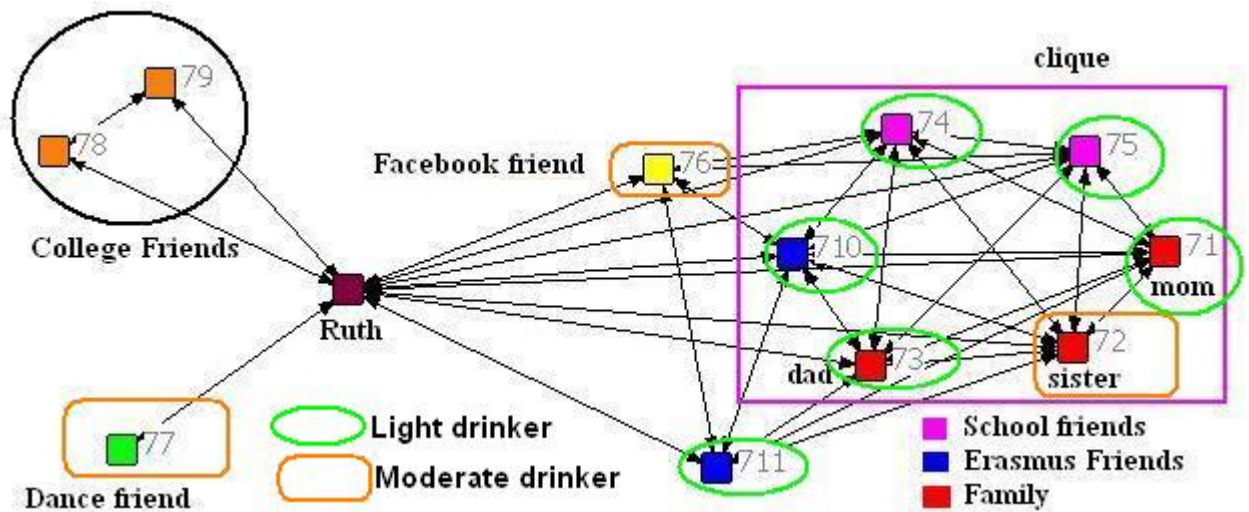


Figure 28: Ruth's overall network

Ruth belongs to a family where no one drinks to excess. Her father (person 73) completely abstains from alcohol because he *'does not like drinking'*. Her mother (person 71) only drinks occasionally. Ruth described that she might have a glass of wine with her colleagues once in a few months. Her sister (person 72) goes out on the weekends with her own friends. Ruth described that she only drinks socially with her friends and never with an intention to get drunk.

Ruth started drinking when she was 17 years old. Persons 74 and 75 who are Ruth's best friends from school are the only people in the network (besides her family) who knew her before she began drinking. It appears from her interview that they started drinking together and formed similar attitudes and behaviour towards drinking. Ruth recalled that she and her friends did not like drinking as much as some of the other students in her school right from those early days. Her interview draws on several similarities between the drinking behaviours of these friends and Ruth's own behaviour. She described that she and her friends have never liked going to pubs and clubs unless there was a special occasion such as a friend's birthday. They prefer to socialize in each others' homes or go for shopping or to the cinema.

“They are pretty much the same as me. We don't really drink that much because we don't like it. We'd have an odd night once every few weeks if even and we'd be happy with that. We just don't see the point of going out and getting drunk and not remembering anything or not knowing what we're doing. We see that as really (stresses) pointless”

Ruth recalled during the interview that the last time they went out was on New Years' eve. They had enjoyed a *'couple of drinks'* with dinner to celebrate the New Year and had returned home by mid night. This was at least 6 weeks before the interview.

Of the other friends who are very salient to her, persons 710 and 711, have a similar drinking behaviour. Ruth recalled that both girls have *'the same thoughts on drinking as she'*. Ruth spent a year with them in relation to Erasmus. She did not mention any occasions or episodes which suggest that they might have socialized in drink related ways during this time. It appears that most of their activities did not involve alcohol.

“We did a lot of things together. I was new to the place so they showed me around. We did homework together, we’d have classes together, and we’d have dinner. During the week we’d go to the cinema and on the weekends if we had time we’d go shopping”

Person 76 who is a friend Ruth made on Facebook drinks more frequently than her. She described during the interview that he goes out with his mates every weekend and ‘*sees drinking to get drunk as more acceptable than she or her school friends would*’. Although Ruth has never drunk with him, she feels that he drinks in moderation.

Persons 78 and 79 are her classmates in college. Ruth does not have much idea about their drinking behaviours because she never drinks with them. As commented in chapter 7, Ruth has only been on a night out with them once. It was a class night out in the first year. She described that they have their own friends from home with whom they go drinking on the weekends. Ruth does not see them outside college. Similarly, Person 79, who Ruth knows from the dance class drinks at the weekends with her own friends. Ruth has never gone out with her but she feels that person 79 does not like the idea of drinking with an intention to get drunk.

Ruth’s survey response suggests that she perceives her proximal peers to drink less than once a month, have 1-2 drinks on an occasion and never drink to drunkenness. It appears from her interview that these perceptions correspond closely with those of her school friends and the two friends she made on Erasmus. It is clear from her interview that her own behaviour is very similar to theirs’. It is also apparent that whatever little Ruth drinks, it is with these people especially persons 74 and 75 who are her best friends. These friends have known her from the time when she didn’t drink at all. They developed similar drinking attitudes together and started reinforcing them in their day to day interaction. It is also possible that Ruth’s drinking

behaviour is also influenced by her parents however it appears from her interview that she and her parents *'do not talk much about drinking'*. Ruth is in the final year of college and yet her friendship with her class mates is restricted to the class room. The most salient peers in her network are embedded in the clique (boxed in pink), which exists outside college.

8.4 Cross Case Analysis

A detailed and tabulated cross case analysis follows. It presents participants' responses to key survey items against their network features and themes identified across the cases as well as the number of occasions these were evidenced. A check (✓) in the following tables indicates occurrence of a theme whereas a shaded cross (X) indicates absence of a theme.

<i>Cross case analysis 1 of 3</i>		Survey Measures			Network Measures				Interview Themes							
		Age	Years spent in DIT	Living arrangement	Average age of network	Network Size	Effective Size	Structural typology	Most or all of the salient friends							
									exist outside college (26)	live in the same general area as ego (15)	are embedded in a dense subgroup (26)	went to the same school as ego (21)	socialize in several ways with ego (25)	regularly interact with ego (25)	provide social companionship (25)	exchange emotional support with ego (26)
1	Mary	20	3	With parents	25.5	32	20.3	OLC	✓	✓	✓	✓	✓	✓	✓	✓
2	Emma ^{1,3}	20	3	Shared	22.3	20	12.8	OLC	✓	X	✓	X	✓	✓	✓	✓
3	Helen	20	3	With parents	23.7	20	11	OLC	✓	X	✓	✓	✓	✓	✓	✓
4	Ruth	22	4	With parents	27.4	11	6.6	CN	✓	✓	✓	✓	✓	✓	✓	✓
5	Linda ²	19	3	With parents	26.2	20	10	C/P	✓	✓	✓	✓	✓	✓	✓	✓
6	Edel	19	2	With parents	21	13	5.2	OLC	✓	✓	✓	✓	✓	✓	✓	✓
7	Pam ³	19	2	With parents	22.3	17	10.9	OLC	✓	X	✓	✓	✓	✓	✓	✓
8	Sue ¹	18	<1	Shared	19.6	7	2.4	OLC	✓	✓	✓	✓	✓	✓	✓	✓
9	Debbie ^{1,3}	21	3	Shared	22.5	17	9.4	OLC	✓	X	✓	✓	✓	✓	✓	✓
10	Meg	19	2	With parents	21.7	19	8.6	OLC	✓	✓	✓	✓	✓	✓	✓	✓
11	Fay ¹	21	3	Shared	25.7	20	10.5	G	✓	✓	✓	✓	✓	✓	✓	✓
12	Bella ³	21	4	With parents	24.8	10	2.4	OLC	✓	✓	✓	✓	✓	✓	✓	✓
13	Katie	19	2	Shared	21.3	18	6.2	G	✓	X	✓	✓	✓	✓	✓	✓
14	Amy ²	20	1	With parents	28.2	20	12.3	OLC	✓	X	✓	✓	✓	✓	✓	✓
15	Lisa	20	3	With parents	18.6	24	8.1	G	✓	✓	✓	✓	✓	✓	✓	✓
16	Tom	21	4	With parents	23.3	23	10.6	OLC	✓	✓	✓	✓	✓	✓	✓	✓
17	Peter ^{1,2}	20	1	Shared	27.9	13	8.7	OLC	✓	X	✓	X	✓	✓	✓	✓
18	Sam	23	3	With parents	25.4	26	12.8	OLC	✓	✓	✓	✓	✓	✓	✓	✓
19	Alex	20	3	Shared	20.6	5	2.6	SC	✓	X	✓	X	✓	✓	✓	✓
20	John	22	4	With parents	25.6	23	6.3	OLC	✓	✓	✓	✓	✓	✓	✓	✓
21	Adam	20	<1	With parents	23.2	18	3.7	G	✓	✓	✓	✓	✓	✓	✓	✓
22	Brian ¹	22	3	Shared	21.9	14	4	G	✓	X	✓	✓	✓	✓	✓	✓
23	Cormac	21	2	Shared	26.3	21	15.5	OLC	✓	X	✓	✓	X	X	X	✓
24	Gary	23	4	Shared	25	12	7	C/P	✓	✓	✓	X	✓	✓	✓	✓
25	Rob	21	3	With parents	24.6	17	10.8	OLC	✓	X	✓	X	✓	✓	✓	✓
26	Ken ²	20	1	With parents	25	17	4.2	G	✓	✓	✓	✓	✓	✓	✓	✓

¹ Cases where ego shares accomodation with 1 or 2 salient friends
² Cases where a salient friend is a boyfriend/girlfriend known in contexts outside of college/school
³ Cases where a college friend is also salient
SC: Small clique, OLC: Overlapping cliques, G: Group, C/P: Core and periphery, CN: Contextualized network

Personal Networks, Normative Perceptions and Drinking Behaviours

Cross case analysis 2 of 3	Survey Measures				Interview themes											
	Personal Consumption*				Drinking Norms among salient friends**								Age of first drink preceded a salient friendship (9)	Change in drinking behaviour after befriending a salient peer ² (3)	Ego feels compelled/encouraged to drink similarly when in the company of a salient peer ² (10)	Ego rejected the norms of a friend(s) after a period of conformance (3)
	Frequency of drinking	No. of drinks	Frequency of drunkenness	Age of first drink	Salient friendships preceded age of first drink (23)	Drinking behaviour homophily with ego (26)	Ego started drinking with salient peers (21)	Drinking norms developed over several years of shared experiences involving alcohol (22)	Ego mainly drinks with salient peers (25)	Drinking norms are mutually reinforced through behaviour (25)	Conformance to group norms is expected and/or encouraged (20)					
1	Mary	Once/wk	5-6	Once/wk	16	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
2	Emma	Once/wk	7-8	Once/wk	16	✓	✓	X	X	✓	✓	X	✓	X	✓	X
3	Helen	Once/wk	5-6	Once/wk	15	✓	✓	X	✓	✓	✓	X	X	X	X	X
4	Ruth	< once/m	1-2	Never	17	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
5	Linda	Twice/wk	5-6	Once/wk	17	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X
6	Edel	Once/wk	5-6	Once/wk	16	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
7	Pam	Once/wk	7-8	2-3 days/m	16	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X
8	Sue	Twice/wk	9-10	Once/wk	13	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
9	Debbie	Twice/wk	5-6	Once/wk	16	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X
10	Meg	2-3 days/m	3-4	Never	≥ 18	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
11	Fay	3-4 days/wk	≥ 15	Twice/wk	14	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
12	Bella	Once/wk	7-8	Once/wk	13	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X
13	Katie	Twice/wk	7-8	Once/wk	13	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X
14	Amy	2-3 days/m	3-4	Once/m	14	X	✓	X	X	✓	✓	X	✓	✓	✓	X
15	Lisa	Twice/wk	9-10	Twice/wk	13	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
16	Tom	Twice/wk	≥ 15	Twice/wk	16	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
17	Peter	2-3 days/m	3-4	< once/m	16	X	✓	X	X	✓	✓	X	✓	✓	✓	✓
18	Sam	Once/wk	≥ 15	Once/wk	15	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓
19	Alex	2-3 days/m	1-2	< once/m	16	X	✓	X	X	✓	✓	X	✓	X	✓	X
20	John	Once/wk	9-10	Once/wk	16	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
21	Adam	2-3 days/m	3-4	Once/m	17	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
22	Brian	Once/wk	≥ 15	Once/wk	15	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
23	Cormac	Once/m	3-4	Once/m	17	✓	✓	✓	✓	X	X	X	X	X	X	X
24	Gary	Twice/wk	9-10	Once/wk	13	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
25	Rob	Once/wk	11-12	Once/wk	16	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
26	Ken	2-3 days/m	1-2	< once/m	15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

¹ Drinking Cohort: Red (heavy), Yellow (moderate), Green (light), Gender: Pink (female), Blue (male), ² Corresponds to instances when a salient relationship followed age of first drink
*Frequency of drinking and drunkenness: typical month, No. of drinks: typical occasion, **Parents were not found to be influential in any ego network

Cross case analysis 3 of 3	Survey Measures				1, 2 and 3 reflect that proximal peers drink* ¹	Interview themes			Survey Measures		Interview themes		
	Perceived descriptive norms (proximal peers) *					Drinking behaviour of most salient peers			Perceived Injunctive norms (Proximal peers)	Salient peers see drinking to get drunk as			
	1** Frequency of drinking	2** No. of drinks	3** Frequency of drunkenness	Drinking jargon ² used in the interview reflects		Examples, episodes and instances ³ recalled in the interview reflect	QF** of drinking (where mentioned) corresponds closely to 1, 2 and 3 (18)	Approval of drinking to get drunk ***		'the thing to do' (23)	'not to be judged' (3)	'a stupid thing to do' or 'waste of money' (4)	
1	Mary	Twice/wk	5-6		Twice/wk Once/wk				Heavily				Heavy drinking
2	Emma	Twice/wk Once/wk	7-8	Twice/wk Once/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	X	X	
3	Helen	Twice/wk	5-6	Twice/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	X	X	
4	Ruth	< Once/m	1-2	Never	Lightly	Light drinking	Light drinking	✓	Disapproved	X	X	✓	
5	Linda	Twice/wk	7-8	Twice/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	X	X	
6	Edel	Once/wk	5-6	Once/wk	Heavily	Heavy drinking	Heavy drinking	not mentioned	Approved	✓	X	X	
7	Pam	Twice/wk Once/wk	9-10 7-8	2-3 days/m Once/m	Heavily	Heavy drinking	Heavy drinking	not mentioned	Approved	✓	✓	X	
8	Sue	Twice/wk	9-10	Twice/wk	Heavily	Heavy drinking	Heavy drinking	not mentioned	Approved	✓	X	X	
9	Debbie	Twice/wk	5-6	Twice/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	X	X	
10	Meg	2-3 days/m	3-4	Never	Moderately	Moderate drinking	Moderate drinking	✓	Disapproved	X	X	✓	
11	Fay	3-4 days/w	≥ 15	Twice/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	X	X	
12	Bella	Once/wk	7-8	Once/wk	Heavily	Heavy drinking	Heavy drinking	not mentioned	Approved	✓	X	X	
13	Katie	Twice/wk	9-10	Twice/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	X	X	
14	Amy	2-3 days/m Never	3-4 0	Once/m Never	Moderately	Moderate drinking	Moderate drinking	not mentioned	Approved	✓	X	X	
15	Lisa	Twice/wk	9-10	Twice/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	X	X	
16	Tom	Twice/wk	≥ 15	Twice/wk	Heavily	Heavy drinking	Heavy drinking	not mentioned	Approved	✓	X	X	
17	Peter	2-3 days/m	3-4	2-3 days/m	Moderately	Moderate drinking	Moderate drinking	✓	Disapproved	X	X	✓	
18	Sam	Once/wk	≥ 15	Once/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	X	X	
19	Alex	2-3 days/m < Once/m	3-4 1-2	2-3 days/m < once/m	Moderately Lightly	Moderate drinking	Moderate drinking	✓	Approved	✓	✓	X	
20	John	Twice/wk	11-12	Once/wk	Heavily	Heavy drinking	Heavy drinking	not mentioned	Approved	✓	X	X	
21	Adam	2-3 days/m	3-4	2-3 days/m	Moderately	Moderate drinking	Moderate drinking	✓	Approved	✓	X	X	
22	Brian	3-4 days/w Twice/wk	≥ 15	3-4 days/w Twice/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	✓	X	
23	Cormac	2-3 days/m	3-4	2-3 days/m	Moderately	Moderate drinking	Moderate drinking	✓	Approved	✓	X	X	
24	Gary	Twice/wk	9-10	Twice/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	X	X	
25	Rob	Twice/wk Once/wk	13-14	Once/wk	Heavily	Heavy drinking	Heavy drinking	✓	Approved	✓	X	X	
26	Ken	Once/wk 2-3 days/m	7-8 3-4	Once/wk Never	Heavily Moderately	Moderate drinking	Moderate drinking	not mentioned	Disapproved	✓	X	✓	

* where perceived norms of close friends and best friend differ, both are given (1st row: close friends, 2nd row: best friend)

**Frequency of drinking and drunkenness: typical month, No. of drinks: typical occasion, QF: Quantity/Frequency

¹ Categorization based on the drinking intensity criteria as outlined in Chapter 5, Table 4

² Heavy: *Hammered/messy/wasted/plastered*, Moderate: *tipsy/giddy/buzzing from alcohol/able to hold a conversation/react normally to situations*, Light: *drink only socially*

³ Heavy drinking: *getting sick/falling over/slurred speech/getting into fights/having blackouts/not remembering the night*, Moderate drinking: *enjoying the night/ not getting injured, sick, lost or violent/not being a burden on others by having to be looked after or being brought home*, Light drinking: *just having 1 or 2 social drinks such as with dinner or at a party before heading home*

***Survey responses strongly agree/agree were grouped into 'approved', neither agree nor disagree into 'neither' and strongly disagree/disagree into 'disapproved'

The first spread sheet clearly depicts that the most salient peers were always found to exist outside college settings and that they were embedded in dense sub groupings often comprising long standing friendships dating back to school years. In most cases, these salient friends lived in the same general area as the participants and/or shared an accommodation with them. Further, these friendships featured regular interaction, reciprocal exchange of social companionship and emotional support and socialization in varied ways. The only exception was Cormac who described that his closest friends with whom he went to school now live in other towns. Cormac works long hours most days of the week as well as attends college. He does so to support himself financially. It is because of these reasons that he gets very little time to '*socialize*' or '*keep in touch*' with his friends. The themes related to regular interaction, socialization in varied ways and provision of social companionship were therefore not reflected in Cormac's interview. Although Cormac does not interact with his friends regularly, he does rely on them for emotional support. It is also interesting to note that 21 of 26 participants had spent 3 or more years in DIT, yet their salient subgroups mostly comprised friends from outside DIT and interaction with college friends remained limited to college settings, college nights out or exchange of instrumental support. In only a few cases, a college friend was found to be salient in addition to older friends from school/home. These included the networks of Emma, Debbie, Pam and Bella each of whom had one or two friend(s) from college who was (were) salient to them.

The second spread sheet depicts participants' responses to personal consumption items on the web survey against interview themes related to the development and dissemination of drinking norms in their networks. It provides a summary of evidence supporting the influence of the

most salient peers on participants' personal consumption. As is evident from the tabulated findings, drinking behaviours of the most salient peers and the participants were found to be homophilous (similar). This finding was consistent across all networks examined in this study. Further, in majority of cases, salient friendships preceded age of first drink and participants' earliest experiences involving alcohol occurred in the company of their school friends. Drinking norms in these cases developed over several years during which participants shared alcohol related experiences with their salient friends. Most participants described that they mainly drink with their salient friends; that group norms related to alcohol are mutually reinforced through behaviour in social situations and that conformance to alcohol related group norms is expected and encouraged among their salient friends. These findings reflect that tacit pressures to follow the norms of the group do exist within most networks. Further, parents were not found to influence drinking behaviours of the participants. This was consistent across all ego networks.

The cases where the theme '*salient friendship preceded age of first drink*' did not occur included the networks of Amy, Peter and Alex. For Amy and Peter, the most salient peer was a relatively recent girlfriend and boyfriend respectively whereas for Alex the most salient peers were friends he had recently made during his study period outside of Ireland. In cases where a salient friendship followed age of first drink, it was noted that the participants either changed their drinking behaviours after befriending such peer(s) and/or described feeling compelled and encouraged to drink similarly when in the company of such friend(s). In these instances, peer influence offers a more likely explanation of similarity in drinking behaviours than peer selection. Some of these cases such as the networks of Linda, Peter and Ken are discussed in detail in section 8.3. Therefore, while the design of this study does not preclude the possibility

of a reverse causal explanation, it adds weight to the presented results. In some cases, participants described rejecting the norms of some friends after having conformed to them for a certain period of time. These cases (Sam, Peter and Ken) are discussed in section 8.3.

Table 38, presented in section 8.2 identified the salient network members whose drinking behaviours corresponded closely to participants' survey reports of perceived norms (proximal peers). The third spreadsheet of cross case analysis demonstrates how this correspondence was established for both descriptive and injunctive norms. Specifically, it provides survey measures of perceived descriptive and injunctive norms, categorizes them in accordance with the drinking intensity criteria presented in chapter 5 (Table 4) and presents this information against comparable and related themes found in the interviews. As described in section 8.2 the participants used various colloquial terms and drinking jargon in describing their friends' drinking levels and in recalling specific examples and episodes. The themes used in this analysis were therefore largely derived from this knowledge. The tabulated findings reflect consistency in perceived norms of proximal peers reported in the web survey and those of the most salient peers as it appears from the interviews.

8.5 Linking the Outcomes of Web Survey and SNA

The use of SNA in combination with the web survey uncovered important findings in this study. On one hand, the analysis of networks and interviews complemented the findings of the web survey by demonstrating agreement with them and offering probable explanations. On the other hand, this combination extended and enriched the quantitative findings by providing a novel perspective on norm salience and bringing to light important aspects of participants'

networks which could not have been explored and uncovered following a survey based methodology alone. Further, this approach also uncovered some unexpected findings which open up new fields of inquiry within normative research. These aspects are discussed next.

First, SNA and the qualitative analysis validated the web survey in that a very close correspondence was found between the perceived norms of proximal peers in the survey and those of the most salient peers in the ego networks. In general, these peers shared strong and long standing friendships with the participants based on mutual trust, companionship and reciprocal exchange of emotional support. These peers also scored high on numerical scores of tie strength. The literature on saliency emphasizes that it is crucial to understand how students decide which of their friendship groups to draw from when answering items querying normative perceptions in surveys (McAlaney et al., 2011). This information is directly related to the effectiveness of SN interventions. Given that the ties identified as being the ‘most salient’ were very significant in the social lives of the participants and contributed to their social and emotional well being, it is highly likely that the participants were thinking of these individuals when conceptualizing proximal peers in the web survey. These findings suggest that individuals are likely to think of specific rather than generic peer groups when they respond to normative items on SN surveys.

Second, participants’ self reported drinking behaviours as reported in the web survey were found to be very similar to the drinking behaviours of their most salient peers. In general, this similarity in drinking behaviour appeared to be due to peer influence rather than selection. This is in agreement with the web survey which found perceived drinking of proximal peers to be closest to and predictive of participants own drinking. This finding that our networks influence

and shape our behaviour is also backed by recent network research (Christakis and Fowler, 2009; Rosenquist et al., 2010) which provides evidence of influence up to three degrees. This research was based on the Framingham Heart Study data base which contains detailed information on over 12,000 individuals monitored over more than three decades since 1971. The researchers found that a person was 50 percent more likely to drink heavily if a person they are directly connected with also drinks heavily and 36 percent more likely to drink heavily if a friend of a friend drinks heavily. The impact extended up to three degrees of separation: our friend (one degree), our friend's friends (two degrees), our friend's friends' friends (3 degrees).

Third, one of the key findings from the web survey as discussed in chapter 6 was that proximal peers (close friends and best friends) were found to be better predictors of personal drinking behaviour than distal peers and that parents were not found to be a significant source of influence. Qualitative analysis of the interviews complements these findings by providing evidence that participants' drinking behaviours were primarily influenced by friends who were socially salient to them in several ways and that parents were not the primary influence. Further, SNA and qualitative interviews extended this finding by identifying who these salient peers were, where they were situated in the networks and how they influenced participants' drinking behaviours. SNA combined with qualitative interviews allowed examining how drinking behaviours and attitudes developed and sustained over the years in participants' networks, and how the members currently socialize. The results provided useful and consistent evidence that the structure of individuals' networks was related to the drinking behaviours and attitudes of their inhabitants and provided useful information about the development, reinforcement and transmission of drinking norms. In general, it was found that the participants

developed their perceptions of what is normative drinking behaviour within tightly knit sub groups and that it was within these sub groups that they regularly reinforced these norms in social situations. It was demonstrated with the aid of examples and network visualizations that the most salient peers were embedded in cohesive sub groups which existed outside college settings. For example, the participants whose networks were shaped like a ‘group’ described the ‘group’ as the central and the most dominant element of their social lives. The most salient and influential nodes were found to be always embedded in the ‘group’. Similarly, in networks shaped like core/periphery, the most salient and influential peers were always rooted in the ‘core’. The ‘overlapping cliques’ type networks were different in that, the most salient peers were scattered in different cliques, each clique being distinct in its relevance to the participant. However, it was noticed that the most salient and influential peers were almost always embedded in a clique which existed outside college settings and generally comprised older friends.

Fourth, the web survey found that DIT students misperceive and more specifically overestimate the drinking of other students on campus and that perceived norms predict personal consumption. On its own, this finding justifies the use of SN marketing campaigns in DIT to reduce alcohol consumption rates on campus. However, the analysis of networks and interviews suggests otherwise and emphasizes that establishing misperceptions should not be the only basis for a SN marketing campaign and that norm salience is a key factor in this equation. Given that the most salient and influential peers were found to exist outside of DIT, this study does not support SN marketing campaigns in DIT as these mostly address the norms of a ‘typical student’ rather than those of a more intimate group of friends.

Last, the qualitative interpretation of interviews provided useful information about network dynamics. It was found that sometimes individuals rejected the drinking norms of friends because they no longer found them preferable or appropriate. As a consequence of this mismatch between drinking behaviours, friendships in a network sometime decay and even diminish altogether. Although relatively uncommon, this phenomenon does occur and requires further understanding.

The implications of these findings are discussed in the next chapter.

9 Discussion of Results

9.1 Introduction

This chapter addresses the research objectives set out in chapter 5, section 5.2, in light of the key findings. It also highlights the implications of these findings and their contributions to SN theory. In doing so, the research objectives are revisited and their origin and rationale restated. The evidence regarding each research objective is presented. The implications and theoretical contributions of the findings are discussed next. The limitations of this study are then acknowledged and some useful recommendations for future research follow.

9.2 Summary of Evidence Against Research Objectives

9.2.1 Research Objectives 1 and 2

The first two objectives of this research stemmed from the apparent inadequacy of existing policies in Ireland to reduce alcohol consumption and related harm and the need to consider alternative strategies such as the SN marketing campaigns to deal with this problem. However, there is an apparent lack of published empirical work examining the potential of SN theory in Ireland. In order to justify the use of SN marketing campaigns to reduce alcohol consumption in any population of interest, an important first step is to establish that misperceptions of alcohol related norms exist in the population. In line with this rationale, the first objective of this study was

1. To investigate the extent of misperception among Irish students regarding peer drinking norms

The campus norm was found to be clearly inclined towards heavy drinking with the average consumption figures showing that DIT students drink approximately 5 days a month, consume nearly 9 drinks on a typical occasion and get drunk every week. As hypothesized, the findings indicated an overall misperception of the campus norm. Specifically, students overestimated the drinking of most students at DIT perceiving them to drink more often (80% of the sample overestimated the norm), consume higher quantities of alcohol (60% of the sample overestimated the norm) and drink to drunkenness more frequently (85% of the sample overestimated the norm) than they themselves. The results demonstrated that DIT students on average perceive other DIT students to drink almost twice as often as them in a typical month, consume at least 1 additional drink on a typical occasion and get drunk twice as frequently as them in a typical month. Further, students also estimated their proximal peers to drink more alcohol more frequently than their own selves. These perceptions rose as the social distance from the individuals increased, with the perceived norms of proximal peers being closest to students' own drinking behaviours. These findings were consistent across all campuses of DIT and across gender. These were also consistent for abstainers who comprised 4% of the sample.

Related to the first objective, the second objective of this research was

2. To examine the association of normative perceptions of prevalence with students' own drinking behaviour

As hypothesized, an overall positive and statistically significant correlation was found between individuals' own drinking behaviours and their perceptions of the behaviour in peers. The

strength of this association was found to be stronger for proximal peers than distal peers and among proximal peers, stronger for best friend than close friends. Hierarchical multiple regression analysis revealed that higher perceptions of prevalence of drinking (permissive descriptive norms) predicted higher personal consumption after several known confounding factors were accounted for. This effect was stronger for proximal peers than distal peers. Parental alcohol use however, correlated positively but weakly with personal consumption and did not significantly predict the latter. Overall, regression models were able to explain 41.4% of the variance in frequency of drinking (typical month), 73% of the variance in number of drinks (typical occasion) and 52.6% of the variance in frequency of drunkenness (typical month).

9.2.2 Research Objective 3

The literature reviewed in chapter 3, section 3.9, drew attention to an overall lack of research examining the potential of injunctive norms in inducing behaviour change and identified it as one of the key weaknesses of SN theory. It is unclear from the existing research whether descriptive or injunctive norms are more likely to change behaviour and should therefore be preferred in SN marketing campaigns. In line with this, the third objective of this research was

3. To study the relative impact of injunctive and descriptive norms on drinking behaviour

The findings demonstrated that descriptive norms have a stronger effect on personal consumption than injunctive norms. Specifically, it was found that the perceptions of descriptive norms were more strongly correlated with personal consumption than those of

injunctive norms and that this was consistent across all reference groups examined in the study²⁹. Similarly, hierarchical multiple regression analysis revealed that while perceived injunctive norms of proximal peers, predicted personal consumption of alcohol, these effects were not significant once the perceived descriptive norms were introduced into the regression model³⁰. Further, the addition of perceived injunctive norms to regression models did not improve the explained variance in dependent variables as much as the addition of perceived descriptive norms did (chapter 6, section 6.4).

9.2.3 Research Objectives 4 and 5

One of the primary considerations for the success of any SN marketing campaign is to target those reference groups which are the most salient and relevant to the population of interest. As discussed in chapter 3, section 3.9.3, a key challenge faced by SN research relates to identifying the most salient reference groups for a population and understanding how individuals visualize these groups. SNA is a trans-disciplinary field which uses sophisticated mathematical techniques embedded in graph theory to study relational data. The fourth and the fifth objectives of this study were aimed at addressing this gap of norm salience via SNA and were stated as

4. *To identify and locate the salient peers in personal networks of students using social network analysis*

²⁹ The only exceptions were the perceived injunctive and descriptive norms of parents which correlated positively but weakly with personal consumption.

³⁰ The only exception was the perceived injunctive norms of proximal peers and mother when they predicted one's frequency of drunkenness. These effects were significant even after controlling for perceived descriptive norms

5. *To examine the association of personal networks with normative perceptions and drinking behaviour*

Research objective 4 was addressed by examining the composition and structure of ego networks in parallel with a numerical and qualitative assessment of tie strength. Research objective 5 was addressed by integrating survey and interview data to examine the correspondence between self reported personal consumption/perceived norms as reported in the survey and the drinking behaviours of network members as transpired from the in depth interviews.

Compositional analysis revealed that in general, the networks comprised a higher percentage (more than 70%) of peers from outside college than from within college. Five distinct typologies were identified based on structural variations in the networks which were explained with the help of network visualizations in chapter 7. A key finding which emerged from the analysis of network structures combined with an assessment of tie strength and a qualitative interpretation of the interviews was that the strongest and the most salient ties existed outside college settings generally embedded in cohesive and intimate sub groups. Synonymous with Granovetter's (1973) indicators of tie strength, these ties generally comprised long standing friendships based on regular interaction, intimacy, mutual trust and exchange of social companionship and emotional support.

As hypothesized, the integration of qualitative and quantitative data revealed that the drinking behaviours of salient network members (based on interviews) corresponded closely with both self reported drinking behaviours of the participants and their perceptions of the behaviour in proximal peers (based on survey). This reinforces the results of the web survey which found

the perceived norms of proximal peers to be closely related to students' own drinking behaviours. Further, it appeared that the similarity in drinking behaviours of the participants and their salient peers was attributable to the influence of these peers rather than the reverse causal explanation which implies self selection into networks with similar drinking behaviours. Finally, the structure of individuals' networks was found to provide useful information about how norms developed, sustained and transmitted in networks. Specifically, the study provided strong and consistent evidence that participants' perceptions of what is normative drinking behaviour were largely developed within cohesive sub groups of strong and intimate ties mostly comprising school friends and that it was within these sub groups that they regularly reinforced these norms in social situations. This was exemplified with a discussion of specific cases and cross case analysis in chapter 8, section 8.3 and 8.4.

Further, these friends were found to be more salient and influential than family. This supports classic research on college drinking which argues that there is a pronounced shift in influence from parents to peers at the onset of college (White et al., 1991). Subsequently, peers become increasingly important as youngsters become relatively independent from parental oversight and control (Brown et al., 1997). This is also in agreement with the web survey which found the perceived norms of proximal peers to be more influential than parental norms.

9.3 Implications and Theoretical Contributions

9.3.1 First Evidence of Alcohol Related Misperceptions in Ireland

One of the contributions of this study is that it provides the first evidence which documents misperceptions of alcohol related norms in Ireland and establishes their impact on personal

consumption. In doing so, it extends and supports the research which has already validated SN marketing theory in other heavy drinking cultures which are similar to Ireland (McAlaney and McMahon, 2007). SN marketing campaigns induce behaviour change by reducing misperceptions related to the problem behaviour (Berkowitz, 2004). Therefore, a primary prerequisite of any SN marketing campaign aimed at reducing drinking rates is to first establish if misperceptions of peer drinking norms exist in the population and then reduce these misperceptions via intervention. As commented in chapter 3, section 3.8.4, SN theory is often criticized in relation to its applicability in situations where a majority of the population exhibits heavy drinking behaviour thus making it normative. The proponents of SN approach argue that even in such situations, individuals will overestimate peer drinking and that consequently misperceptions will still hold. Although misperceptions of alcohol related norms have been documented in other heavy drinking environments like the UK (McAlaney and McMahon, 2007) which is culturally similar to Ireland, local evidence was still required in order to justify a SN campaign in Ireland and establish base line statistics for campaign evaluation. Further, this step was also a pre requisite to exploring the issue of norm salience which was the key focus of this study.

9.3.2 Integration of Norm Salience and SNA

A unique aspect of this study was the integration of norm salience and SNA. It is the first study to have utilized ego network analysis to examine the SN theory in context of college drinking. In doing so it provides a unique perspective on norm salience based on structural configurations and functioning of networks.

To date, most SN marketing interventions have utilized the ‘typical or average college student’ as a normative referent (Perkins, 2003b; Lewis and Neighbors, 2006b). The present study provides evidence that the ‘typical or average student’ may not always be an ideal normative referent. The finding that the most salient and relevant ties of participants existed outside DIT embedded in cohesive subgroups often comprising older friends from school implies that a SN marketing campaign targeting the norms of a ‘typical or average student’ may not be successful in DIT. This finding calls in question the applicability of SN marketing campaigns to reduce alcohol consumption in Ireland particularly in DIT. It also has important implications for current practice and policy on SN approach.

Misperceptions alone are not conclusive

The study contributes to theory by providing evidence that establishing misperceptions of alcohol related norms is not conclusive evidence on which to base a SN marketing campaign to reduce drinking rates in a college population. Even when students misperceive the norms of other students on campus, a SN based campaign may not be justified as was found to be the case in DIT. This is because norm salience is an equally important consideration which must be addressed in parallel for improved institutional and policy measures. This implies that practitioners of SN theory should preferably reassess their procedures to ascertain that socially salient referent groups are being targeted in campaigns. As commented in chapter 3, section 3.9.3, while SN theory acknowledges the importance of salient norms in influencing behaviours (Berkowitz, 2004), in practice, interventions are impeded by challenges in addressing this key issue appropriately (McAlaney et al., 2011). This in part reflects why most studies have primarily focussed on documenting misperceptions alone. The present study

demonstrates that the integration of SNA and norm salience is a useful way to address this gap in literature. Incorporating SNA in the planning stages of a campaign to determine salient referent groups can be an effective strategy towards improved policy making.

Accessing groups outside of college

The present study also contributes to SN theory by raising several practical questions in relation to accessing salient referent groups when they inhabit networks outside of college settings as was found to be the case in DIT. For example, if these groups were to be targeted with a norm change strategy such as personalized normative feedback, what would be the best way to access these peers, ascertain their consumption levels and establish that misperceptions exist within these groups? Similarly, what kind of normative messages would be most appropriate for such tightly knit groups? Finally, why would the target audience believe in the content of normative feedback over their own experiences with their friends? These issues pose serious difficulties for the implementation of a SN campaign to target these groups. There is another potential barrier which policy makers must be aware of. Normative belief interventions operate on normative misperceptions. The extent of overestimations decrease as does the social distance between an individual and referent group as has been shown to be the case in DIT. Researchers warn that there may come a point in which a referent group is so close to an individual that normative belief interventions based on that referent group would have a negligible effect (McAlaney et al., 2011). This implies that SN campaigns may not be an appropriate strategy in such situations.

Phenomenon of commuter colleges: Focussing campaigns on pre college years

The present study's findings related to norm salience stand in contrast to the majority of normative intervention research conducted in the US, which has primarily focused on the 'typical student' and found it to be a successful strategy in reducing problem behaviours. It is highly likely that this deviation is related to the differences in residential arrangements at the American and the Irish colleges and that the study may have uncovered a phenomenon which is especially applicable to commuter colleges. This is a key contribution which can have important implications for policy making. Most of the colleges in the US academic system offer on-campus accommodation for students generally referred to as 'dorms' or 'residential halls'. In addition, most of these colleges are based away from major cities constituting what can be described as self contained cities boasting a vibrant campus life. Perkins (2003a), explains that the socialization in residential colleges is extremely '*peer intensive*'. Reflecting on the above, it is only natural for these students to develop close and intimate ties with each other because they live together, interact frequently in a variety of ways and lack frequent contact with other reference groups such as previous circles of friends and family. On the other hand, the majority of Irish colleges have very limited on-campus accommodation with some like DIT offering no such option. As a result, most college students in Ireland and specifically those studying at DIT reside in self catering accommodation or live with their families and commute to college every day from their homes. While the American colleges lie on one end of the spectrum secluded from the major cities and constituting a thriving campus life, DIT lies on the farthest extreme with no on-campus accommodation and therefore relatively fewer opportunities to develop intimate ties with in-college peers and several campuses scattered across the city with very little interaction between them. It is a natural rather than a scientific

observation that the social circles of students in such situations will generally comprise friends from their area/locality with whom they spend most of their free time. Further, the major colleges of the country are based in Dublin which is the centre of social activity in Ireland. Since most of the Irish students go to colleges in Dublin, they do not have to reduce communication with older friends who probably also go to a college in Dublin. The opportunities to interact and develop deep friendships with college peers are thus markedly reduced.

The above observations are supported by SN literature. Berkowitz (2004) reflects that when most students in a college live off campus, they may differ from the on-campus students in terms of the saliency of campus norms. Given that this study may have reflected a trend especially prominent in commuter campuses, it may be time to re-examine how policy is being framed and to attempt alternative approaches to target such populations with socially salient normative content. One possible solution can be to shift focus of interventions on pre college years. The present study demonstrated that the development, reinforcement and transmission of drinking norms primarily occurred in cohesive sub groups comprising friends with whom the participants had gone to school and with whom they continued to drink regularly. Schools may therefore be the most suitable and practical environments to maximize access to these sub groups via SN marketing campaigns. This approach may also be beneficial in addressing some of the practical concerns discussed under the preceding heading. Institutional and policy measures may potentially benefit from this approach as it offers the opportunity to attempt to curtail unhealthy drinking behaviours in adolescent groups before they transform into irrevocable and binding group norms. Recent SN research in Europe (Balvig and Holmberg, 2011) and Australia (Hughes et al., 2008) also proposes similar suggestions. Balvig and

Holmberg (2011) argue that targeting school children with SN interventions to reduce smoking can prevent the onset of smoking before it turns into problem behaviour. In contrast, when interventions are focussed on college students, the risk behaviours which are sought to be modified are already well established among those participating. Reflecting on the above, this may be an even greater concern in situations where alcohol becomes legally available at a younger age (18 years in most of the Europe compared to 21 in USA) and most youngsters begin drinking even earlier than the legal drinking age as is the case in Ireland.

9.3.3 Descriptive norms vs. Injunctive norms

The present study is one of the few studies to directly compare the two types of norms in terms of their influence on drinking behaviour. It strengthens SN theory by providing evidence that perceptions of descriptive norms have a markedly stronger effect³¹ on personal consumption than those of injunctive norms and should therefore be the preferred target for SN marketing interventions. This means that while targeting misperceptions of descriptive norms is an effective strategy to induce behaviour change, targeting only the perceptions of injunctive norms may not be as successful. Further, the finding that injunctive norms of only the proximal peers were found to have any significant effect on personal consumption implies that individuals are largely unaffected by injunctive norms of distal peers and that SN campaigns based on injunctive norms of distal referents are not likely to succeed. Past research has pointed out that one of the primary motivations to conform to injunctive norms is the fear of negative evaluation and that social approval is particularly sought for maintaining group

³¹ Based on the assumption that perceptions preceded drinking behaviour

memberships (Borsari and Carey, 2001). It is only natural then that within proximal groups, individuals might feel more motivated and even compelled to conform to injunctive norms because of the fear of social exclusion or negative evaluation. The problems associated with accessing these proximal groups and the possibility that SN campaigns will have a negligible impact when the deviance between personal behaviours and perceived norms of such peers is little further complicate addressing injunctive norms of proximal groups in practice.

9.4 Other Findings and Their Contributions

The study demonstrated that some participants distanced themselves from certain friends because they no longer deemed their drinking behaviours acceptable and/or appropriate. As described with the help of specific examples in chapter 8, section 8.3.1, these individuals described feeling that their reputation or health would have been at stake had they maintained close ties with such friends. This finding implies that friendships do deteriorate and decay as a result of people rejecting the drinking norms and practices of their peers if they don't find such norms preferable or apt. It contributes to SN theory by drawing attention towards a relatively uncommon but important phenomenon which suggests that just as people select friends based on similar drinking behaviours (Mundt et al., 2012), they also sometimes reject friends based on dissimilar drinking behaviours. This merits further consideration and opens up a new field of inquiry within normative research.

Another finding that emerged from the analysis of network structures was the identification of 'overlapping cliques', which was found to be the most common structural configuration in this study. As described in chapter 7, such networks featured multiple cliques which overlapped

through common nodes or cross clique friendships. The identification of this typology contributes to network literature by extending and adding to the previous research by Bellotti (2008) which examines structural variations in ego networks and reports the occurrence of four network types namely, small cliques, groups, core/periphery and contextualized.

9.5 Limitations

The following factors must be considered when evaluating the results of this study.

1. **Causality:** This study was cross sectional in nature making it difficult to derive causal inferences. Although, it was assumed on the basis of theory and past longitudinal research (Fearnow-Kenny et al., 2001) that normative perceptions cause personal consumption, the research design does not preclude an alternative reciprocal relationship. As described previously, the design of this study allowed assessing if relationships in the networks preceded or followed participants' age of first drink. Further, the qualitative nature of in depth interviews allowed examining the contexts in which relationships formed and flourished. These aspects of the study strengthen the analysis and suggest peer influence as a more plausible explanation for similarity in drinking behaviours of the participants and their networks compared to selection.
2. **Self Reports:** As is often the case with alcohol related research, the results of this study are based entirely on self reports, the validity of which is a known issue of long standing debate in substance use research (Midanik, 1988). However, there is evidence that self reports in college samples can be reasonably reliable and valid (Johnston, 2001). This issue was discussed in detail in chapter 5, section 5.5.1 in relation to web surveys.

3. Generalizing the results: This study was based on a student sample which naturally limits the applicability of findings to the general population. However, such a sample makes it easier and practical to compare the results with existing normative belief research, which originates almost exclusively from the American college system. Findings from the web survey may be generalized to undergraduate student population at DIT. However, they might not accurately reflect consumption behaviours and normative beliefs prevalent at other colleges in Ireland.

It must also be acknowledged that the network results are not *statistically* representative of the population. They must therefore be interpreted with caution and the design of this research replicated on a wider scale to validate the results. However, this is the first study to examine, SN theory in relation to college drinking using ego network approach combined with in depth interviews. The over arching aim of utilizing network science in this study was to understand the theoretical aspects of the phenomenon of norm salience rather than achieving statistical representativeness. Further, as described in section 9.2.3, DIT has a commuter campus without any live-in accommodation, at the extreme end of the spectrum from many American colleges which feature on-campus residence halls and a thriving campus life. It is possible that network results and related qualitative explanations which emerged in this study reflect a phenomenon which is especially relevant to commuter colleges. To the extent that this is a phenomenon of commuter colleges, the results may be tentatively and naturalistically generalized.

4. The structural typologies derived in this study are not exhaustive of all possible typologies. Ideally, a statistically representative survey can identify other types of networks and assess their distribution and impact in the population. However,

generating such detailed ego network data from a statistically representative sample remains prohibitively costly in terms of time and money.

5. It must also be acknowledged that ego network studies view networks from the eyes of participants. It is generally not possible to collect network data from all alters which is why the connections examined in this study are based entirely on how the participants perceived their ego networks rather than individual reports from each network member.
6. From a network perspective, a whole network study would have allowed mapping a complete network of students at DIT based on self reports. This would have provided maximum coverage of the population. However, an inherent limitation of such an approach would have been its inability to capture relationships extending beyond the college settings which in this study were found to be salient. The incorporation of whole network approach in intervention work may be more beneficial in situations where salient referent groups lie within college boundaries as has been explained in sec 9.6 (Point 4).
7. Including multiple institutes in this study would have allowed examining if misperceptions of alcohol related norms and explanations related to norm salience are also reflected in other Irish third level institutes.
8. This study was based on undergraduate students at DIT. It would have been interesting to examine if the networks of post graduate students have a similar or different functioning.
9. Finally, social networks are dynamic and fluid. They change over time. A longitudinal study collecting network data at multiple time points would have allowed examining

how the composition and structure of networks, their functioning and the norms they foster change and evolve over time.

9.6 Recommendations for Future Research

This section draws attention to some important theoretical and practical aspects which future research may wish to explore.

1. The one unexpected finding which emerged from the analysis of networks in this study is that the peers who were the most salient in determining participants' drinking behaviours were found to exist outside college settings. This finding implies that a SN marketing campaign targeting a 'typical student' may not be an effective strategy within DIT to reduce drinking levels. As explained in section 9.2.3, this may be a phenomenon which is especially relevant to commuter campuses like DIT and many other colleges in Ireland. Future research should begin by examining the extent to which this phenomenon is consistent in bigger samples. Ideally, a representative sample of full time undergraduate students at DIT is recommended to validate these results. The present study might be regarded as a valuable exploratory investigation which clearly showed the benefit of combining network analysis with in depth interviews. However, given the constraints of time and money, it can be impractical to conduct a large scale representative study which collects such detailed ego network data via in depth interviews. Future research may address this problem by utilizing web based methods and tools for collecting ego network data and exploring attributes of relationships and drinking behaviours. The use of web based methods in SNA is growing (Coromina and Coenders, 2006). There is mixed evidence about the potential of these methods. While some researchers report that the

quality of ego network data collected via web methods seems to compare well with that of traditional modes (Coromina and Coenders, 2006), others argue that the quality of data may suffer due to respondents answering in a time saving and almost ‘mechanical’ manner (Matzat and Snijders, 2010). Studies that have used such methods include Marin (2004), Manfreda et al (2004), Coromina and Coenders (2006), Vehovar et al (2008), Matzat and Snidjers (2010) and Tubaro et al (2012). These studies reflect that careful pretesting of the survey instrument, visual design, use of graphic stimuli to prevent invalid entries, format of the name generators and possibilities of dynamic interaction between the respondent and the questionnaire are some of the challenges associated with web based network studies. Further, this body of research suggests that the number of alters (network members to be named) should be limited in some substantial manner in web based methods as it lengthens the survey and increases the risk of respondents dropping out. In response to these concerns, a forthcoming publication (Tubaro et al., 2012) suggests the use of participant generated web based sociograms in internet surveys. The study reports on the potential of an interactive graphical interface which enables the participants to draw their own personal networks with simple and intuitive tools. The authors report that the method reduces respondent burden and the risk of drop out.

2. It will be beneficial if other Irish colleges with commuter campuses replicate the current study to validate and cross examine the findings among their students. It will help in establishing figures that most closely represent the drinking patterns of Irish students. It will also help to confirm the DIT finding, that misperceptions of alcohol related norms exist among students. In addition, if the other institutions also find that the most salient relationships exist beyond the college frontiers, then this will reinforce the findings of this

study and endorse the conclusion that SN marketing campaigns focusing on a ‘typical student’ are not an effective strategy within Irish colleges to reduce alcohol consumption.

3. Another potentially interesting area to be explored by future SN research in Ireland relates to assessing the applicability of SN marketing interventions to second level (school) students in Ireland. The results of this study indicate that the most salient peers existed in cohesive structures outside college. These structures often comprised people who went to the same schools and lived in the same general area. It is possible that socially salient referent groups for school students will comprise on-campus peers. Thus, SN marketing interventions targeting ‘typical student’ as a normative referent may be more useful in changing perceptions of drink related norms in Irish school students. This is an important hypothesis based on the main findings of this study and should be investigated further because it would have important implications for SN research in Ireland. It is crucial that a research focusing on populations of school children address related ethical concerns. For example, children under 18 years of age are not legally competent to provide consent to participate in a research. This necessitates obtaining appropriate consent from first the school authorities and then the parents or guardians. Clearly laying out the purpose of the investigation and the involvement of children in the outcomes of research in a manner which is appropriate to the participants is also paramount. Last, compliance with legal requirements of child protection and safeguarding children during research are also central to the ethics of conducting such a study.
4. The approach taken by the present research shows the real benefit to be gained from incorporating network science in SN marketing interventions to reduce alcohol

consumption and future researchers should follow this lead. This recommendation is especially relevant to those institutions where salient reference groups reside within college settings and campus wide normative marketing campaigns are hence deemed suitable. As described earlier, this is not the case with DIT based on the results of this study. The incorporation of network science in the existing line of standard and more customary intervention work can be achieved via the whole network approach which is well suited for campus wide programmes. Indeed, the idea of utilizing the whole network approach in interventions targeting norm change has generated increased interest in academic research circles. A recent study (Paluck and Shepherd, 2012) examining the descriptive norm for peer harassment in a high school setting reports on the first randomized experiment to assign individuals to treatment based on their position in the school's complete social network. As elaborated in chapter 4, section 4.5.4, they used a survey and SNA to map the entire social network of a school in Connecticut. Widely known people and clique leaders were identified as social referents. A widely known individual was conceptualized as a person who had many ties to individuals across the network whereas clique leaders were defined as those who had a large number of ties within a clique. A subset of these social referents was assigned to a randomized intervention which involved these people demonstrating their opposition to peer harassment in the school assembly. The results showed that these social referents were able to significantly change the perception that peer harassment was typical. This shows that SNA is a cutting edge and novel approach in SN research. However, the SN literature on college drinking reflects a lack of similar studies and this is a gap where future research should contribute. If network ties can be discerned on a campus wide scale, the influential individuals or those most at risk for being affected

by normative pressures can be targeted by virtue of their network positions. It can also enable researchers to design interventions which target groups of inter connected people. This is because network science allows one to identify centrally located hubs that have access to most of the larger network (Valente, 1996; Valente, 2003; Valente et al., 2004). For example, the usual approach to reduce drinking on a campus is to either broadcast feedback to everyone or work with a small group that is felt to be at risk because survey data identified them to be heavy or problem drinkers. An alternative strategy can be to identify hubs in the social network comprising people who might or might not be drinkers and target them with corrective normative feedback. This can have important implications because research confirms that people can be influential in the spread of norms even if they do not exhibit the behaviour themselves. They can still be the carriers of the idea and thus promote it unintentionally (Valente, 1996; Valente, 2003; Valente et al., 2004). Encouraging results have been documented with the use of this strategy in promoting better diets and safer sex previously (Buller et al., 1999; Sikkema et al., 2000). A further benefit of incorporating network science in normative research at campus level is that it will allow us to study the change in student networks over time and the implications this has on peer drinking norms. The elaborate knowledge of connections at campus level will allow for comparing and monitoring the network dynamics, patterns of drinking and the relation between them at later points in time. This will improve programme monitoring and implementation by offering improved and specifically tailored follow up normative feedback embedded in longitudinal research. The above discussion highlights some of the avenues that the future SN research can explore and benefit from.

5. A relevant and interesting area of research is that of network dynamics. Networks are vibrant and change perhaps is the only constant in them. They grow, shrink and even die with time. Norms are no different. They too change as we age, move up in college, befriend new people or let go of older ones. The present study demonstrates that sometimes individuals rejected the drinking norms of their friends because they no longer found them acceptable and in line with their own behaviours and attitudes. Though these friends still formed part of the participants' networks, the participants made a conscious decision to distance themselves from them. The occurrence of this phenomenon may be relatively uncommon but the fact that it exists and that it is practiced opens up a new field of inquiry.
6. Finally, the majority of past SN studies have been cross sectional in nature. It is recommended that the increased use of longitudinal research will provide increased methodological rigor to SN marketing interventions. This will provide the benefits of observing and measuring changes over time, adapting the interventions accordingly and making stronger causal interpretations.

9.7 Conclusions

In conclusion, norm salience is an important consideration in the applicability, planning and success of SN marketing interventions. However, the complexities associated with examining socially salient environments of target audiences render it an under researched area. Consequently, most studies tend to focus on documenting misperceptions of alcohol related norms as the basis of implementing a norm change strategy to reduce drinking rates among college students. The integration of norm salience and SNA in this study improves our understanding of how norms function and impact individuals' behaviours. The results suggest that evidencing misperceptions may not always be a conclusive rationale justifying a SN campaign and that establishing the salience of normative referents to be targeted is equally important. It is possible that the results of this study are especially relevant to commuter colleges like DIT where salient social groups exist outside college, embedded in cohesive, intimate and long standing sub groups of school friends. In such colleges, a 'typical or average student' may not be an ideal referent and policy measures may benefit by shifting the focus of SN campaigns to pre college years and school settings. This may be a better approach to target socially proximal groups who may be harder to access in college populations. The standard adage is in this regards very much the case – further research is needed and recommended.

In terms of the aetiology of personal drinking behaviours, the results of this study support previous research on the importance of perceived peer norms. However, SN interventions have mostly focussed on changing perceptions related to the norms of prevalence. The present study supports this to be an effective strategy and suggests that perceptions of descriptive norms have a stronger impact on personal consumption compared to those of injunctive norms.

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Appendix 1: Alcohol in Ireland: Consumption, Harm and Policy

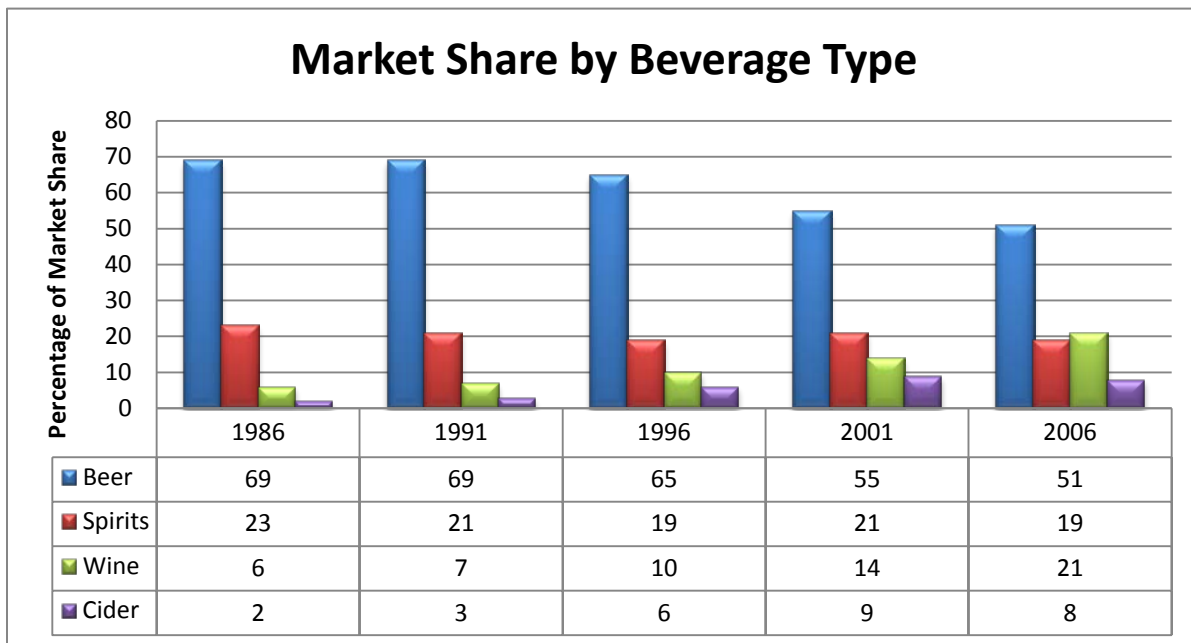


Figure 1: Market Share by Beverage Type (Hope, 2007)

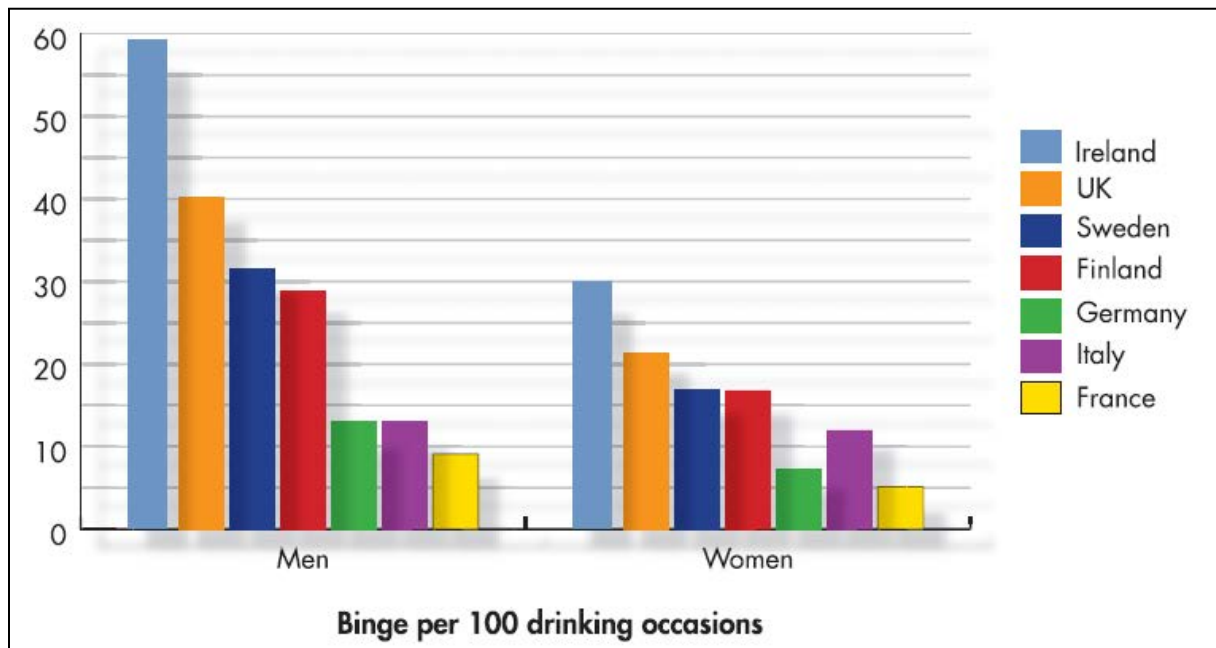


Figure 2: Binge Drinking¹ - European Comparison (Ramstedt and Hope, 2005)

¹ Binge drinking conceptualized as consumption of alcoholic beverages corresponding to at least one bottle of wine, 25 centilitres of spirits or 4 pints of beer, or more, during one drinking occasion in the past 12 months

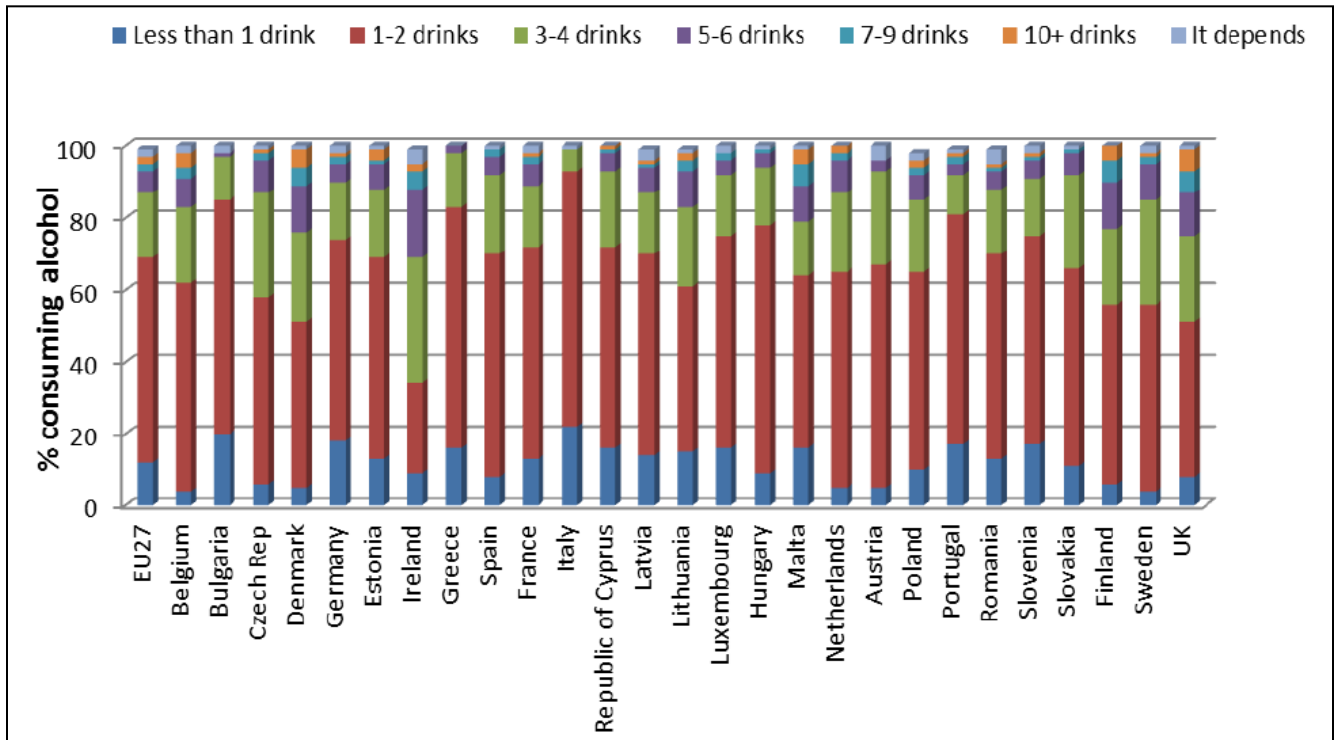


Figure 3: Alcohol consumption in a single sitting (EC, 2011)

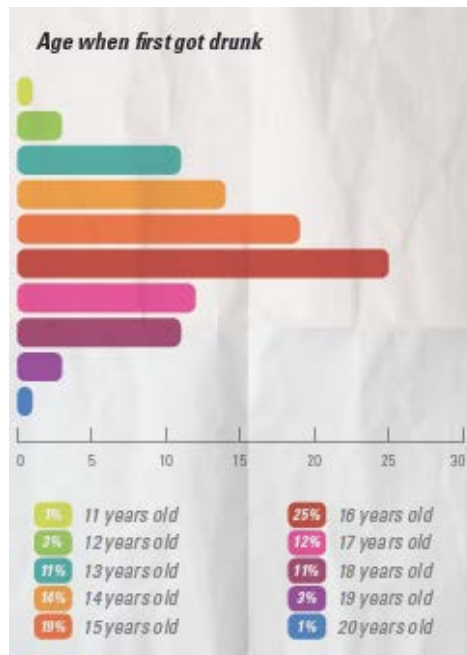


Figure 4: Age of drinking onset in Ireland (Unicef, 2011)

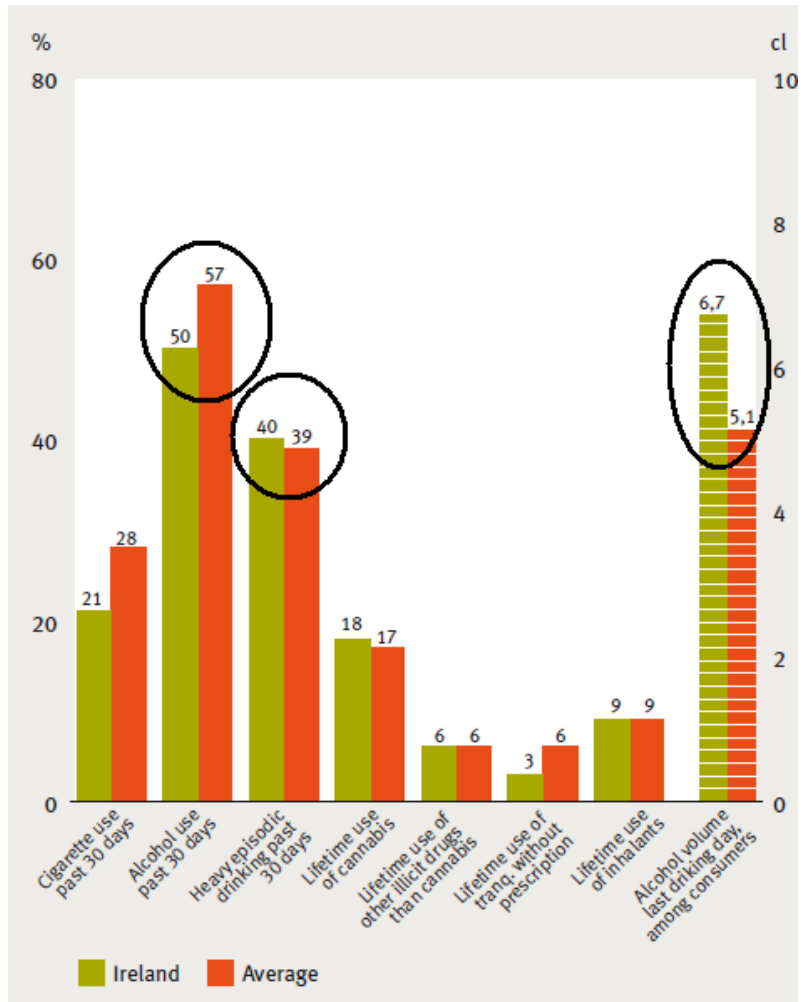


Figure 5: Summarized results from ESPAD (2011) (Hibell et al., 2012)

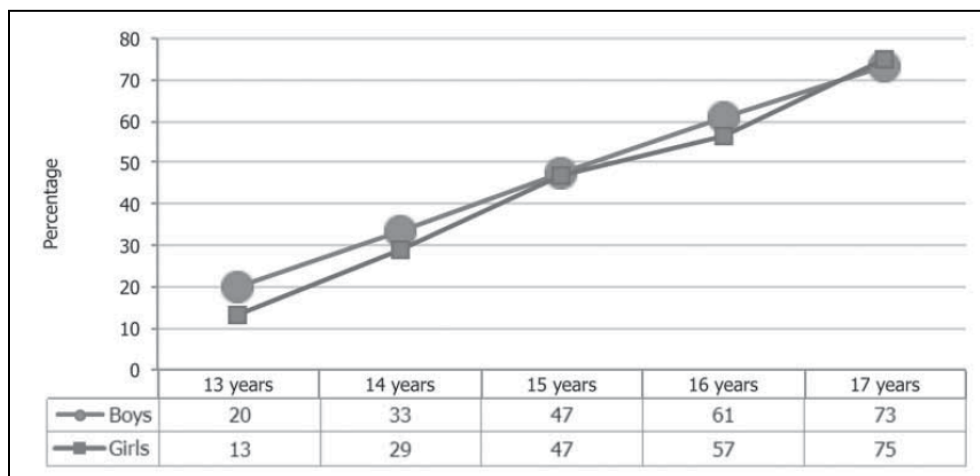


Figure 6: Proportion of school children reporting having ever been drunk by age and gender (Doyle et al., 2009)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Consumption –litres/adult	11.1	11.4	12.1	12.5	13.1	13.7	14.1	14.3	14.2	13.3	13.5	13.4	13.3	13.4	12.4	11.3
Alcohol Morbidity (HIPE)																
patient contacts		9254	10646	11263	12266	13535	14499	15823	17757	17541	17378		17053	18024	18400	
Acute		4711	5431	5276	5111	5932	6951	7585	8836	8841	8257	ICD-10 intro	3650	3637	3319	
Chronic		3829	4446	5051	6060	6424	6230	6641	7237	7071	7370		10096	10750	11247	
Liver disease		705	756	914	1078	1158	1306	1684	1676	1616	1745		3290	3629	3827	
Detox in-patient		28	21	55	197	243	185	288	381	503	567					
Alcohol mortality per 100,000 pop (adult)		3.8	4.8	6.3	6.4	6.2	5.9	7.6	6.5	5.3	7.1					
Acute		0.3	0.9	1.1	1.0	0.9	0.7	1.3	1.2	0.5	0.5					
Chronic		2.1	1.6	1.5	2.2	1.9	2.4	2.2	1.8	1.7	2.3					
Liver disease		1.2	1.3	2.1	2.0	2.4	2.2	3.3	2.9	2.6	3.5					
Alcohol problems, per 100,000 pop (NDTRS)											168.3	176.0	182.9	222.6	243.3	
Road deaths (total)	404	437	453	472	458	413	415	411	376	335	374	396	365	338	279	239
Social problems*																
Drunkness offences	5299	3183	6049	7724	9334	11009	14687	17804	22701	21818	11707	13036	11890	10476		
Public order	8153	10209	16384	25755	27945	30993	37749	42754	56822	53488	26964	29752	35329	40824		
Assaults	7992	8601	9272	9694	11516	11311	11996	14437	16629	13136	12441	12518	13650	15105		

Figure 7: Alcohol consumption and related harm indicators in Ireland (Hope and Butler, 2010)

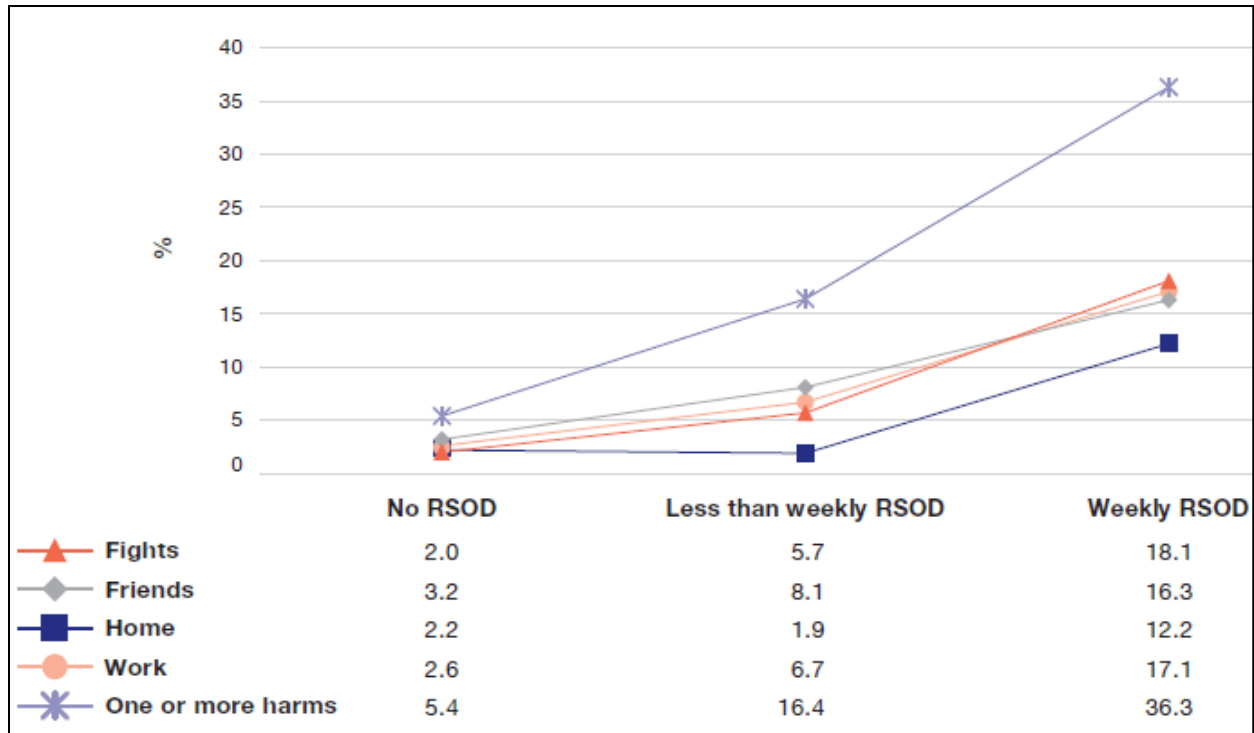


Figure 8: Harm to self by drinking patterns (Mongan et al., 2009)

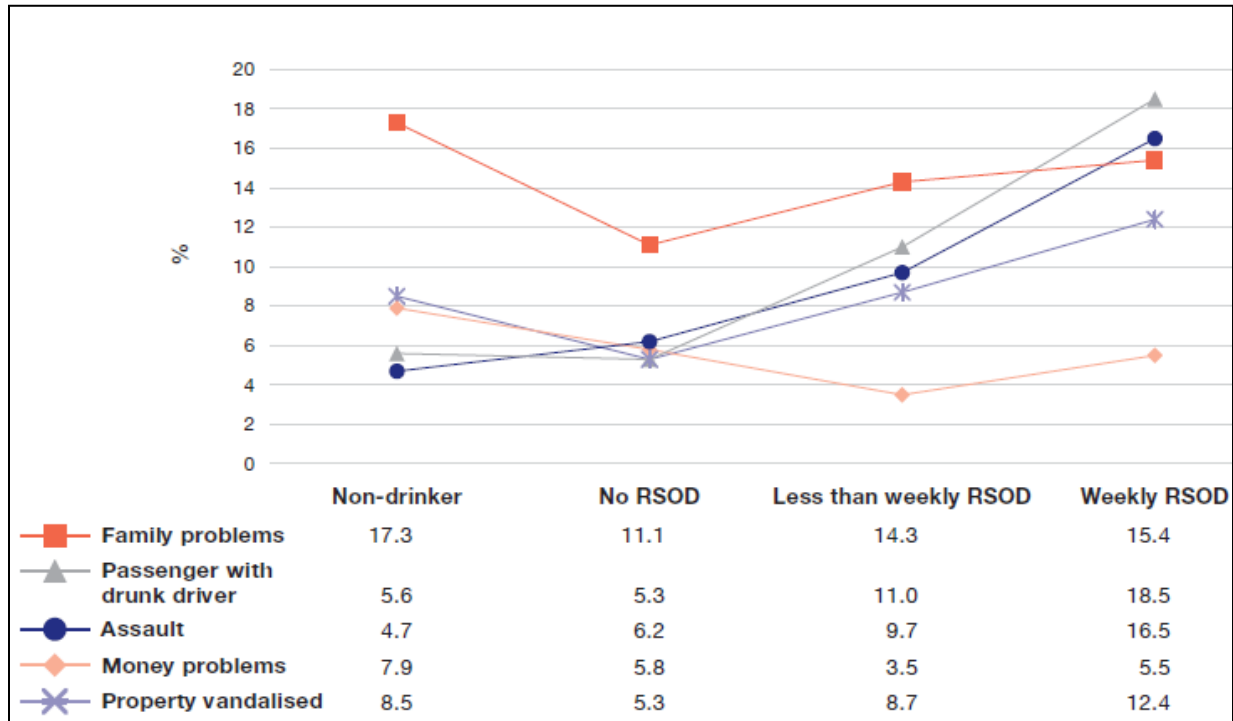


Figure 9: Harm to others by drinking patterns (Mongan et al., 2009)

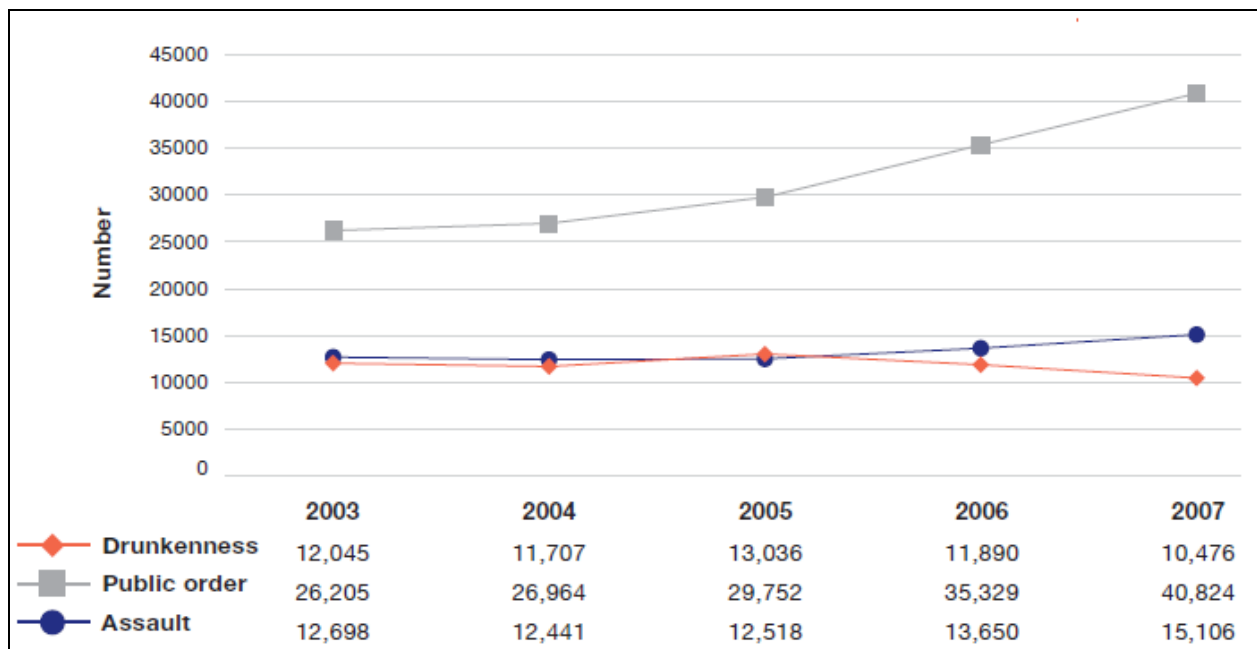


Figure 10: Trends in drunkenness, public order and assault offences among minors (Mongan et al., 2009)

	€million	% of total costs
Cost to the health care system of alcohol related illnesses	€1,200	32
Cost of alcohol related suicides	167	5
Cost of alcohol related road accidents	526	14
Cost of alcohol related crime	€1,189	32
Cost of output lost due to alcohol related absence from work	330	9
Cost of alcohol related accidents at work	197	5
Cost of alcohol related premature mortality	110	3
Total	€3,719	100

Figure 11: Costs to society of problem alcohol use in Ireland (Byrne, 2010)

1990	Minister of Health requested the development of a National Alcohol Policy
1994	BAC reduced to 0.80mg
1994-01	No increase in alcohol taxes
1996	National Alcohol Policy Published by Government
2000	Intoxicating Liquor Act 2000 - Longer opening hours - Free movement of Licences - Lifting of restrictions for granting certain licences - Temporary closure for selling to minors (under 18 years of age)
2002	Tax increase on cider (Dec 01 Budget) Strategic Task Force Interim Report
2003	Tax increase on spirits (Dec 02 Budget) Intoxicating Liquor Act (2003) - Revert to earlier closing time on Thursday nights - Temporary closure for serving to drunken customers - Ban on happy hours - Ban on children from pubs after 9 pm (extended to 10 pm later) Proposed legislation to restrict alcohol marketing Establishment of Central Copy Clearance Ireland (CCCI)
2004	Strategic Task Force on Alcohol Second Report
2005	Alcohol marketing legislation shelved in favor of industry self regulation ASAI Voluntary Code of Practice came into effect - covers alcohol advertising on TV, radio, cinema and outdoor/ambient media - 33% audience profiling system introduced AMCMB established to oversee implementation/adherence to voluntary codes
2006	Mandatory alcohol testing (similar to Random breath testing) Below unit cost selling of alcohol allowed (Abolition of Groceries Order)
2008	Report of the Government Alcohol Advisory Group Intoxicating Liquor Act (2008) - Earlier closing time for off-licences - Tougher public order provisions - Court procedure to secure a new wine-only off-license - New grounds for objection to granting of an off-license allowing Gardai and public to intervene - New conditions attaching to the granting of a special exemption order - Regulation to restrict promotions, changed to Industry self regulation Revised Voluntary Code of Practice - Audience Profile cut off reduced to 25% - Ban on alcohol advertising during breakfast time (6 to 10 am) Tax Increase on wine
2009	Excise duty reduced by almost 20% on all alcoholic products (Budget 2010) RRAI established RRAI Code of Practice on the Display and Sale of Alcohol Products in Mixed Trading Premises came into effect
2011	RRAI code under review following the third compliance report

2012	Steering Group report provided recommendations on National Substance Misuse Strategy <ul style="list-style-type: none"> - Maintain high excise duties - Introduce a legislative basis for minimum pricing per gram of alcohol - Introduce a Statutory Code of Practice on the sale of alcohol in off license sector - Strengthen legislation on distance sales - Develop a system to monitor the enforcement of the intoxicating liquor legislation - 9pm watershed for all alcohol advertising on TV and radio - Prohibit all outdoor advertising - Age authentication controls on websites advertising alcohol - Phase out drink industry's sponsorship of sports and other large events by 2016. - Introduce a 'social responsibility' levy through which the drinks industry would contribute to the cost of social marketing and awareness campaigns relating to social and health harms caused by alcohol
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Table 1: Alcohol Policy Activity in Ireland: 1990-2012 (Hope and Butler, 2010; DoH, 2012)

Byrne, S. (2010). Costs to Society of Problem Alcohol Use in Ireland. Health Service Executive. Dublin.

DoH (2012). Steering Group Report on a National Substance Misuse Strategy.

Doyle, P., M. Molcho and S. Gabhainn (2009). HSBC Ireland: Age related patterns in alcohol consumption and cannabis use among Irish children between 1998-2006: Short report. Galway, Health Promotion Research Centre: National University of Ireland.

EC (2011). "Youth attitudes towards drugs: Eurobarometer."

Hibell, B., U. Guttormsson, S. Ahlstrom, O. Balakireva, T. Bjarnason, A. Kokkevi and L. Kraus (2012). "The 2011 ESPAD report: substance use among students in 36 European countries."

Hope, A. (2007). Alcohol consumption in Ireland 1986-2006. Report for the Health Service Executive-Alcohol Implementation Group, Dublin: Health Service Executive.

Hope, A. and S. Butler (2010). "Changes in consumption and harms, yet little policy progress. Trends in alcohol consumption, harms and policy: Ireland 1990-2010." Nordic Studies on Alcohol and Drugs **27**(5): 479-496.

Mongan, D., A. Hope and M. Nelson (2009). Social consequences of harmful use of alcohol in Ireland. HRB Overview Series 9. Dublin: Health Research Board.

Ramstedt, M. and A. Hope (2005). "The Irish drinking habits of 2002-Drinking and drinking-related harm in a European comparative perspective." Journal of Substance Use **10**(5): 273-283.

Unicef (2011). Changing the Future : Experiencing Adolescence in Contemporary Ireland, Report 3: Alcohol and Drugs Report

Appendix 2: Variable details

Variable	Rationale for inclusion	Source	Original Study	Amended version for present study	Rationale for Ammendments
Age	Control variable	McAlaney and McMahon (2007)	How old are you? 18-20, 21-24, 25-34, 35-44, 45-54, 55-64 65 or above	How old are you? _____	Pilot analysis revealed that using a specific value for age such as an open ended numerical variable will be more practical and realistic for analysis.
Gender	Control variable	McAlaney and McMahon (2007)	Are you male or female? Male Female	—	—
Year in college	Control variable	Delaney et al (2008)	What year of the course are you currently in? 1, 2, 3, 4, 5, 6+	How many years have you been in DIT? Less than 1 year, 1 year, 2 years, 3 years 4 years, 5 or more years	Ammendments based on pilot feedback. The original question did not capture the total number of years spent in DIT for students who might have changed courses.
Age of first drink	Control variable	Real and Rimal (2007) Rimal and Real (2005)	The original study provided the following response options to age of drinking onset. younger than 11 years between 11 and 12 years between 13 and 14 years between 14 and 15 years between 16 and 17 years never	How old were you when you had your first drink? (other than just a sip)? Never had a drink 11 years or younger, 12 years, 13 years 14 years, 15 years, 16 years, 17 years 18 years or above	Explanatory line 'other than just a sip', specific ages and the option '18 or above' in response options provided based on feedback from cognitive interviews.
Money available for drinking	Control variable	Darmody et al (2005)	During term time, approximately how much do you spend on average each month on alcohol? _____	How much money is available to you in a typical week for drinking? (related costs such as food and taxis available) I don't drink, € 20 or less, € 21-40, € 41-60 € 61-80, € 81-100, € 101-120, € 121-140 More than € 140	Ammendments (question wording, weekly instead of monthly expenditure and addition of explanatory line) based on feedback from cognitive interviews
Living Arrangement	Control variable	Jones et al (1992)	The original study provided the following response options for living arrangements living in a hall, not living in a hall but living alone or with non relatives, living with family or spouse	Which of the following best describes your living arrangement? I am living with parents, I am living independently and alone, I am living in a shared accomodation, I am living with partner and/or dependent others (children)	Ammendments (response options) based on feedback from cognitive interviews. The final response options reflect various living arrangements in an Irish context (no residential halls)
Drinking group size	Control variable	Demers et al (2002)	The original study provided the following response options to group size one, 2-3, 4-9, 10 or more	How many people do you usually drink with on a typical occasion? I don't drink, alone, 1, 2-3, 4-5, 6-7, 8-9, 10 or above.	Ammendments (response options 'I don't drink' and 'alone') based on feedback from cognitive interviews

Appendix 2: Variable details

Variable	Rationale for inclusion	Source	Original Study	Amended version for present study	Rationale for Ammendments
Communication about alcohol	Control variable	Dorsey et al (1999) Real and Rimal (2007)	Dorsey et al (1999) assesed frequency of communication about 6 topics with friends, family members, RA's and professors 1- safer sex practices, 2- effects of drinking too much alcohol, 3- unwanted sexual advances caused by drinking, 4- binge drinking, 5- physical violence, injuries or fights, 6- feeling sick as a result of drinking Real and Rimal (2007) asked 1. Over the past 2 weeks, how often have you talked with your friends or siblings about your drinking alcohol? 7 point measure (never to more than 6 times) 2. How often do you normally talk with your friends or siblings about alcohol consumption? 10 point measure (never to all the time)	Pilot questionnaire tested a version of Dorsey et al (1999) (Refer to section in chapter 5). The final questionnaire used the following ammended version from Real and Rimal (2007) 1. How frequently does alcohol/drinking come up in your conversation with others? Several times a day, 2-3 times a day, about once a day, a few times a day, once a week, never 2. How often in a typical week does alcohol/drinking come up in your conversation with others? very frequently, frequently, occasionally, rarely, very rarely, never * Explanation added: Think about casual and informal conversations you have with people on day to day basis. For example, After a night out with friends, setting status messages or exchanging comments on facebook or bebo, exchanging emails or text messages, twitter, over dinner at home etc	Ammendments (question wording and response options) based on feedback from cognitive interviews and pilot survey. Dorsey et al (1999) utilized a pen/paper survey in contrast to a web survey employed in this study. The web format of the original set of questions was found to cause confusion in participants which often led to incomplete/unanswered responses. The explanation was added to clarify the meaning of conversation.
Nationality	Filter variable to identify non Irish students (not relevant for this study) in the final sample	Delaney et al (2008)	which of the following best describes your situation? Irish national, Foreign national studying for a full qualification in Ireland, Foreign national studying as part of an exchange program	-	-
Full/Part time	Filter variable to identify part time students (not relevant to this study) in the final sample	McAlaney (2007)	Are you currently a full time/part time student? Full time, Part time	Are you a fill time/part time student at DIT? Full time, Part time	ammendment (question wording) based on feedback from cognitive interviews.
Under/post grad	Filter variable to identify post graduate students (not relevant to this study) in the final sample	McAlaney (2007)	The measure on 'year in college' also included this aspect in the original study	Please choose the one that applies to you. I am an undergraduate student, I am a post graduate student	-
Campus	Filter variable used later for campus wise analysis of data	-	-	Which DIT campus are you based at? DIT Mountjoy Square, DIT Cathal Brugha, DIT Bolton Street, DIT Aungier Street, DIT Kevin Street, DIT Rathmines Road	-

Appendix 2: Variable details

Variable	Rationale for inclusion	Source	Original Study	Amended version for present study	Rationale for Ammendments
Frequency of Drinking (Typical month)	Dependant Variable, Personal consumption measure	McAlaney and McMahon (2007)	How many days in a typical month do you normally drink alcohol? Never or very rarely, less than once a month, once a month, 2-3 days a month, once a week, twice a week, 3-4 days a week, 5-6 days a week, everyday	How often in a typical month do you normally drink alcohol? Never, less than once a month, once a month, 2-3 days a month, once a week, twice a week, 3-4 days a week, 5-6 days a week, everyday	Ammendments (question wording and response option 'never' instead of 'never or very rarely') based on feedback from cognitive interviews
Perceived frequency of drinking of most students in DIT (typical month)	Perceived descriptive norms used as independent variables, measure perceived frequency of drinking (typical month) in peers from different social groups	McAlaney and McMahon (2007)	How many days in a typical month do you think most of your closest friends/average student your age at your University/average person your age in the UK normally drink alcohol? Never or very rarely, less than once a month, once a month, 2-3 days a month, once a week, twice a week, 3-4 days a week, 5-6 days a week, everyday	How often in a typical month do you think most students in DIT/your close friends/your best friend/your mother/your father/ normally drink(s) alcohol? Never, less than once a month, once a month, 2-3 days a month, once a week, twice a week, 3-4 days a week, 5-6 days a week, everyday. * an additional response option 'Not Applicable' provided for questions related to mother and father and an explanatory line added 'Please select the last option if the question is not applicable to you' * choice of distal and proximal social groups based on feedback from cognitive interviews	Ammendments (question wording and response options 'never' instead of 'never or very rarely' and 'Not applicable' in questions related to mother and father) based on feedback from cognitive interviews. The explanatory line 'Please select the last option if the question is not applicable to you' based on pilot feedback
Perceived frequency of drinking of close friends (typical month)					
Perceived frequency of drinking of best friend (typical month)					
Perceived frequency of drinking of mother (typical month)					
Perceived frequency of drinking of father (typical month)					

Appendix 2: Variable details

Variable	Rationale for inclusion	Source	Original Study	Amended version for present study	Rationale for Ammendments
Number of drinks (typical occasion)	Dependant Variable, Personal consumption measure	McAlaney and McMahon (2007)	How many drinks would you normally drink during a night out in a pub/club? 0, 1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14, 15 or more	<p>As you are probably aware, different alcoholic drinks have different quantities of alcohol. For the purpose of the following questions (17-23), please estimate 1 pint of beer or cider as the equivalent of 2 drinks and all other drinks (glass of wine, spirits or shots) as the equivalent of 1 drink each.</p> <p>Thus, somebody who has consumed 3 pints of beer and a glass of wine has consumed the equivalent of 7 drinks i.e. each pint is two drinks (3x2) plus 1 glass of wine (1 drink) leads to a total of 7 drinks.</p> <p>Based on the above values, approximately how many alcoholic drinks do you normally drink on a typical drinking occasion? Remember, 1 pint is the equivalent of 2 drinks; all other beverage is the equivalent of 1 drink each.</p> <p>Same response options as in the original study</p> <p>*an additional question assessed number of drinks consumed on a college night. An explanatory line 'A college night is when you have college/classes the next morning' was added.</p>	Ammendments (provision of standard drink measures, question wording and 'college night' context) based on feedback from cognitive interviews and pilot study.
Perceived number of drinks consumed by most students in DIT (typical occasion)	perceived descriptive norms used as independent variables, measure perceived number of drinks (typical occasion) consumed by peers from different social groups	McAlaney and McMahon (2007)	How many drinks do you think most of your closest friends/average student your age at your university/average person in the UK would normally drink during a night out in a pub/club? 0, 1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14, 15 or more	<p>Based on the above values, approximately how many alcoholic drinks do you normally drink on a typical drinking occasion? Remember, 1 pint is the equivalent of 2 drinks; all other beverage is the equivalent of 1 drink each.</p> <p>Same response options as in the original study</p> <p>* an additional response option 'Not Applicable' provided for questions related to mother and father and an explanatory line added 'Please select the last option if the question is not applicable to you'</p>	Ammendments (provision of standard drink measures, question wording and 'not applicable' option for questions related to mother/father) based on feedback from cognitive interviews and pilot study. The explanatory line 'Please select the last option if the question is not applicable to you' based on pilot feedback
Perceived number of drinks consumed by close friends (typical occasion)					
Perceived number of drinks consumed by best friend (typical occasion)					
Perceived number of drinks consumed by mother (typical occasion)					
Perceived number of drinks consumed by father (typical occasion)					

Appendix 2: Variable details

Variable	Rationale for inclusion	Source	Original Study	Amended version for present study	Rationale for Ammendments
Frequency of drunkenness (typical month)	Dependant Variable, Personal consumption measure	McAlaney and McMahon (2007)	how many days in a typical month do you drink enough alcohol to become drunk? Same response options as in the measure for frequency of drinking (typical month) used in the original study	How often in the course of a typical month do you drink enough alcohol to become drunk? Same response options as in the measure for frequency of drinking (typical month) used in the present study	Ammendments (question wording and response option 'never' instead of 'never or very rarely') based on feedback from cognitive interviews
Perceived frequency of drunkenness of most students in DIT (typical month)	perceived descriptive norms used as independent variables, measure perceived frequency of drunkenness (typical month) in peers from different social groups	McAlaney and McMahon (2007)	How many days in a typical month do you think most of your closest friends/average student your age at your University/average person your age in the UK normally drink enough alcohol to become drunk? Same response options as in the measure for frequency of drinking (typical month) used in the original study	How often in a typical month do you think most students in DIT/your close friends/your best friend/your mother/your father/ normally drink(s) enough alcohol to become drunk? Same response options as in the measure for frequency of drinking (typical month) used in the present study	Ammendments (question wording and response options 'never' instead of 'never or very rarely' and 'Not applicable' in questions related to mother and father) based on feedback from cognitive interviews. The explanatory line 'Please select the last option if the question is not applicable to you' based on pilot feedback
Perceived frequency of drunkenness+A33 of close friends (typical month)					
Perceived frequency of drunkenness of best friend (typical month)					
Perceived frequency of drunkenness of mother (typical month)					
Perceived frequency of drunkenness of father (typical month)					

Appendix 2: Variable details

Variable	Rationale for inclusion	Source	Original Study	Amended version for present study	Rationale for Ammendments
Perceived acceptability/approval of drinking to get drunk in most students at DIT	Perceived injunctive norms used as independent variables, measure perceived acceptability/approval in peers from different social groups about drinking to get drunk	Marcoux and Shope (1997) McAlaney (2007)	<p>Marcoux and Shope (1997) asked: How do your parents/friends/older brothers/older sisters feel about kids your age drinking alcohol? very bad idea, bad idea, neither good nor bad idea, good idea, very good idea</p> <p>McAlaney (2007) asked: How do you think your friends/your family/uk society as a whole feel about people your age drinking enough alcohol to become drunk? strongly disapprove, disapprove, neither approve nor disapprove, approve, strongly approve</p>	<p>Most students at DIT think that drinking to get drunk is acceptable strongly disagree, disagree, neither disagree nor agree, agree, strongly agree</p> <p>My close friends/best friend would approve of me drinking to get drunk strongly disagree, disagree, neither disagree nor agree, agree, strongly agree</p> <p>My mother/father thinks that my drinking to get drunk is very unacceptable, unacceptable, neither unacceptable nor acceptable, acceptable, very acceptable</p> <p>* an additional response option 'Not Applicable' provided for questions related to mother and father and an explanatory line added 'Please select the last option if the question is not applicable to you'</p> <p>*an additional set of questions also assessed perceived acceptability/approval of 'drinking to get drunk on a college night' for each peer group. An explanatory line 'A college night is when you have college/classes the next morning' was added</p>	Ammendments (question wording, use of the term 'drinking to get drunk', response options and 'college night' context) based on feedback from cognitive interviews and pilot study. The explanatory line 'Please select the last option if the question is not applicable to you' for questions related to mother/father based on pilot feedback
Perceived acceptability/approval of drinking to get drunk in close friends					
Perceived acceptability/approval of drinking to get drunk in best friend					
Perceived acceptability/approval of drinking to get drunk mother					
Perceived acceptability/approval of drinking to get drunk in father					

Appendix 3: General Characteristics of Pragmatism (Johnson and Onwuegbuzie, 2004) p18

- The project of pragmatism has been to find a middle ground between philosophical dogmatism and skepticism and to find a workable solution (sometimes including outright rejection) to many longstanding philosophical dualisms about which agreement has not been historically forthcoming.
- Rejects traditional dualisms (e.g., rationalism vs. empiricism, realism vs. antirealism, free will vs. determinism, Platonic appearance vs. reality, facts vs. values, subjectivism vs. objectivism) and generally prefers more moderate and commonsense versions of philosophical dualisms based on how well they work in solving problems.
- Recognizes the existence and importance of the natural or physical world as well as the emergent social and psychological world that includes language, culture, human institutions, and subjective thoughts.
- Places high regard for the reality of and influence of the inner world of human experience in action.
- Knowledge is viewed as being both constructed *and* based on the reality of the world we experience and live in.
- Replaces the historically popular epistemic distinction between subject and external object with the naturalistic and process-oriented organism-environment transaction.
- Endorses fallibilism (current beliefs and research conclusions are rarely, if ever, viewed as perfect, certain, or absolute).
- Justification comes in the form of what Dewey called "warranted assertability."
- According to Peirce, "reasoning should not form a chain which is no stronger than its weakest link, but a cable whose fibers may be ever so slender, provided they are sufficiently numerous and intimately connected" (1868, in Menand, 1997, pp. 5–6).
- Theories are viewed instrumentally (they become true and they are true to different degrees based on how well they currently work; workability is judged especially on the criteria of predictability and applicability).
- Endorses eclecticism and pluralism (e.g., different, even conflicting, theories and perspectives can be useful; observation, experience, and experiments are all useful ways to gain an understanding of people and the world).
- Human inquiry (i.e., what we do in our day-to-day lives as we interact with our environments) is viewed as being analogous to experimental and scientific inquiry. We all try out things to see what works, what solves problems, and what helps us to survive. We obtain warranted evidence that provides us with answers that are ultimately tentative (i.e., inquiry provides the best answers we can currently muster), but, in the long run, use of this "scientific" or evolutionary or practical epistemology moves us toward larger Truths.
- Endorses a strong and practical empiricism as the path to determine what works.
- Views current truth, meaning, and knowledge as tentative and as changing over time. What we obtain on a daily basis in research should be viewed as provisional truths.
- Capital "T" Truth (i.e., absolute Truth) is what will be the "final opinion" perhaps at the end of history. Lowercase "t" truths (i.e., the instrumental and provisional truths that we obtain and live by in the meantime) are given through experience and experimenting.
- Instrumental truths are a matter of degree (i.e., some estimates are more true than others). Instrumental truth is not "stagnant," and, therefore, James (1995: 1907) states that we must "be ready tomorrow to call it falsehood."
- Prefers action to philosophizing (pragmatism is, in a sense, an anti-philosophy).
- Takes an explicitly value-oriented approach to research that is derived from cultural values; specifically endorses shared values such as democracy, freedom, equality, and progress.
- Endorses practical theory (theory that informs effective practice; praxis).
- Organisms are constantly adapting to new situations and environments. Our thinking follows a dynamic homeostatic process of belief, doubt, inquiry, modified belief, new doubt, new inquiry, . . . , in an infinite loop, where the person or researcher (and research community) constantly tries to improve upon past understandings in a way that fits and works in the world in which he or she operates. The present is always a new starting point.
- Generally rejects reductionism (e.g., reducing culture, thoughts, and beliefs to nothing more than neurobiological processes).
- Offers the "pragmatic method" for solving traditional philosophical dualisms as well as for making methodological choices.

Johnson, R. B. and A. J. Onwuegbuzie (2004). "Mixed methods research: A research paradigm whose time has come." *Educational researcher* 33(7): 14-26.

Appendix 4: Pilot Questionnaire

Confidentiality

1. This survey is part of an academic research project on drinking habits of young people.
2. Any information that you disclose here in shall be treated as confidential and used only for academic research purposes.
3. It shall not be possible for the researcher to identify the respondents after the completion of this survey either.
4. Please note that you are free to withdraw from this study
 - at any time
 - without giving a reason for withdrawing
 - without affecting your future relationship with DIT
5. If you have any queries or concerns pertaining to this study or wish to discuss it further, please contact Sarah Samdani on sarahsamdani@hotmail.com.
6. Please read each question carefully and answer honestly. Please answer ALL questions on the survey. This survey typically takes about 10 minutes to complete. The asterisk (*) sign against each question indicates that it is required to be answered

Consent Form

1. Have you been made fully aware about the purpose of this study? *
 - Yes
 - No
2. Do you understand that you are free to withdraw from this study? *
 - at any time
 - without giving a reason for withdrawing
 - without affecting your future relationship with the Institute
 - Yes
 - No
3. Have you been informed that any information you reveal in this survey will be treated as confidential and used only for research purposes? *
 - Yes
 - No
4. Do you agree to take part in this online survey? *
 - Yes
 - No

1. Are you male or female? *
 - Male
 - Female
2. How old are you? *
 - 18-21 years
 - 22-25 years
 - 26-29 years
 - 30 years or above
3. Which of the following best describes your living arrangements? *
 - I am living with parents
 - I am living independently and alone
 - I am living in a shared accommodation
 - I am living with my partner and/or dependent others (children)
4. Which of the following best describes your situation *
 - Irish National
 - Foreign National studying for a full qualification in Ireland
 - Foreign National studying as part of an exchange program
5. How many years have you been in DIT? *
 - Less than one year
 - 1 year
 - 2 years
 - 3 years
 - 4 years
 - 5 or more years

6. How much money is available to you in a typical week for drinking (related costs such as food and taxis included)? *

- €20 or less
- €21-40
- €41-60
- €61-80
- €81-100
- €101-120
- €121-140
- More than €140

7. How often on average in a typical month do you normally drink alcohol? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday

8. How often on average in a typical month do you think most students in DIT normally drink alcohol? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday

9. How often on average in a typical month do you think your close friends normally drink alcohol? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday

10. How often on average in a typical month do you think your best friend normally drinks alcohol? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday

11. How often on average in a typical month do you think your mother normally drinks alcohol? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday
- Not Applicable

12. How often on average in a typical month do you think your father normally drinks alcohol? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday
- Not Applicable

13. How many alcoholic drinks would you normally drink on a typical drinking occasion? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

14. How many alcoholic drinks do you think most students at DIT would normally drink on a

typical drinking occasion? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

15. How many alcoholic drinks do you think your close friends would normally drink on a

typical drinking occasion? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

16. How many alcoholic drinks do you think your best friend would normally drink on a typical drinking occasion? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

17. How many alcoholic drinks do you think your mother would normally drink on a typical drinking occasion? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more
- Not Applicable

18. How many alcoholic drinks do you think your father would normally drink on a typical drinking occasion? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more
- Not Applicable

19. How many alcoholic drinks would you normally drink on a typical weekend night? (Thursday, Friday and Saturday night) *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

20. How many alcoholic drinks do you think most students at DIT would normally drink on a

typical weekend night? (Thursday, Friday and Saturday night) *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

21. How many alcoholic drinks do you think your close friends would normally drink on a

typical weekend night? (Thursday, Friday and Saturday night) *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

22. How many alcoholic drinks do you think your best friend would normally drink on a typical weekend night? (Thursday, Friday and Saturday night) *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

23. How many alcoholic drinks do you think your mother would normally drink on a typical weekend night? (Friday and Saturday night) *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more
- Not Applicable

24. How many alcoholic drinks do you think your father would normally drink on a typical weekend night? (Friday and Saturday night) *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more
- Not Applicable

25. How many alcoholic drinks would you normally drink when you have college the next day? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

26. How many alcoholic drinks do you think most students at DIT would normally drink when they have college the next day? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

27. How many alcoholic drinks do you think your close friends would normally drink when they have college the next day? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

28. How many alcoholic drinks do you think your best friend would normally drink when he/she has college the next day? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more

29. How many alcoholic drinks do you think your mother would normally drink when she has work the next day? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more
- Not Applicable

30. How many alcoholic drinks do you think your father would normally drink when he has work the next day? *

- 0
- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 15 or more
- Not Applicable

31. How often on average in a typical month do you drink enough alcohol to become drunk?

*

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday

32. How often on average in a typical month do you think most students at DIT drink enough alcohol to become drunk? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday

33. How often on average in a typical month do you your close friends drink enough alcohol to become drunk? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday

34. How often on average in a *typical* month do you think your best friend drinks enough alcohol to become drunk? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday

35. How often on average in a *typical* month do you think your mother drinks enough alcohol to become drunk? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday
- Not Applicable

36. How often on average in a typical month do you think your father drinks enough alcohol to become drunk? *

- Never
- 1-2 days a month
- 2-3 days a month
- Once a week
- Twice a week
- 3-4 days a week
- 5-6 days a week
- Everyday
- Not Applicable

37. How old were you when you had your first drink? *

- 11 years or younger
- 12 years
- 13 years
- 14 years
- 15 years
- 16 years
- 17 years
- 18 years or above
- Never had a drink

38. How many people do you typically drink with on a weekend night? (Thursday, Friday and Saturday night) *

- Alone
- 1
- 2-3
- 4-9
- 10 or more

39. How many people do you typically drink when you have college the next day? *

- Alone
- 1
- 2-3
- 4-9
- 10 or more

40. Please select all that apply. The people that I typically drink with mostly include my *

- Boy friend/ Girl friend
- Class mates
- Flat mates
- Friends from college
- Friends from outside college
- Work mates
- Neighbors
- Siblings
- Parents
- Other relatives

41. How frequently do you communicate with the people you typically drink with? Please select the appropriate answer for all categories that apply to you. *

	Less than once a month	Once a month	Twice a month	Once a week	Twice a week	3-4 times a week	5-6 times a week	Everyday
Boy Friend / Girl Friend								
Class Mates								
Flat Mates								
Friends from college								
Friends from outside college								
Work Mates								
Neighbors								
Siblings								
Parents								
Other relatives								

42. Think about the past month. Approximately how many times have you spoken with the people you typically drink with about 'safer sex practices'?

Please select appropriate answers for all categories that apply to you *

	Never	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Boy Friend / Girl Friend							
Class Mates							
Flat Mates							
Friends from college							
Friends from outside college							
Work Mates							
Neighbors							
Siblings							
Parents							
Other relatives							

43. Think about the past month. Approximately how many times have you spoken with the people you typically drink with about 'The Effects of Drinking too much Alcohol'?
Please select appropriate answers for all categories that apply to you. *

	Never	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Boy Friend / Girl Friend							
Class Mates							
Flat Mates							
Friends from college							
Friends from outside college							
Work Mates							
Neighbors							
Siblings							
Parents							
Other relatives							

44. Think about the past month. Approximately how many times have you spoken with the people you typically drink with about 'unwanted sexual advances'?
Please select appropriate answers for all categories that apply to you. *

	Never	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Boy Friend / Girl Friend							
Class Mates							
Flat Mates							
Friends from college							
Friends from outside college							
Work Mates							
Neighbors							
Siblings							
Parents							
Other relatives							

45. Think about the past month. Approximately how many times have you spoken with the people you typically drink with about 'binge drinking'?

Please select appropriate answers for all categories that apply to you. *

	Never	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Boy Friend / Girl Friend							
Class Mates							
Flat Mates							
Friends from college							
Friends from outside college							
Work Mates							
Neighbors							
Siblings							
Parents							
Other relatives							

46. Think about the past month. Approximately how many times have you spoken with the people you typically drink with about 'physical violence, injuries or fights caused by drinking'?

Please select appropriate answers for all categories that apply to you *

	Never	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Boy Friend / Girl Friend							
Class Mates							
Flat Mates							
Friends from college							
Friends from outside college							
Work Mates							
Neighbors							
Siblings							
Parents							
Other relatives							

47. Think about the past month. Approximately how many times have you spoken with the people you typically drink with about 'feeling sick as a result of drinking'?
Please select appropriate answers for all categories that apply to you. *

	Never	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Boy Friend / Girl Friend							
Class Mates							
Flat Mates							
Friends from college							
Friends from outside college							
Work Mates							
Neighbors							
Siblings							
Parents							
Other relatives							

48. Most students at DIT think that drinking to get drunk is acceptable *

- Strongly disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly agree

49. My close friends would approve of me drinking to get drunk *

- Strongly disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly agree

50. My best friend would approve of me drinking to get drunk *

- Strongly disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly agree

51. My mother would approve of me drinking to get drunk *

- Very unacceptable
- Unacceptable
- Neither unacceptable nor acceptable
- Acceptable
- Very acceptable
- Not Applicable

52. My father would approve of me drinking to get drunk *

- Very unacceptable
- Unacceptable
- Neither unacceptable nor acceptable
- Acceptable
- Very acceptable
- Not Applicable

Your feedback on this survey will be greatly appreciated. Please take a few minutes to answer the following questions

1. Did you have any difficulty answering the questions on this survey?

2. Were there any particular questions that confused you?

3. Are there any comments or suggestions that you might have about the survey?

Appendix 5: Questionnaire for the Web Survey

DIT Drinking Survey - Your chance to win an Apple iPad!!!

THIS SURVEY IS MEANT ONLY FOR DIT STUDENTS. PLEASE ANSWER ALL QUESTIONS ON THE SURVEY IN ORDER TO ENTER THE DRAW FOR AN APPLE iPad

CONFIDENTIALITY

1. This survey is part of an academic research project on the drinking habits of young people. It will ask you questions about your drinking behavior and what you think about the drinking habits of relevant others such as your close friends, other students at DIT, etc.
 2. This survey is confidential and will be used only for academic research purposes.
 3. Please note that you are free to withdraw from this study at any time and without giving a reason for withdrawing.
 4. If you have any queries regarding this study or wish to discuss it further, please contact Sarah Samdani on sarah.samdani1@student.dit.ie.
 5. Please read each question carefully and answer honestly. There are no right or wrong answers.
 6. Please answer ALL questions on the survey. This survey typically takes about 10 minutes to complete. The asterisk (*) sign against each question indicates that it is required to be answered.
-

Page One

CONSENT FORM

1. Please provide your consent to participate in this survey

- i. I have been made fully aware about the purpose of this study
- ii. I understand that I am free to withdraw from this study at any stage
- iii. I have been informed that any information I reveal during this survey will be treated as confidential and used only for research purposes
- iv. I agree to take part in this online survey

▪ I agree

▪ I do not want to participate

Page Two

2. Are you male or female?*

- i. Male
- ii. Female

3. How old are you?*

4. Which of the following best describes your living arrangements?*

- i. I am living with parents
- ii. I am living independently and alone
- iii. I am living in a shared accommodation
- iv. I am living with my partner and/or dependent others (children)

5. Which of the following best describes your situation?*

- i. Irish National
- ii. Foreign National studying for a full qualification in Ireland
- iii. Foreign National studying as part of an exchange program

6. Are you a full time or a part time student at DIT?*

- i. Full Time
- ii. Part Time

7. Which DIT campus are you based at?*

- i. DIT Mountjoy Square
- ii. DIT Cathal Brugha Street
- iii. DIT Bolton Street
- iv. DIT Aungier Street
- v. DIT Kevin Street
- vi. DIT Rathmines Road

8. Please choose the one that applies to you*

- i. I am an undergraduate student
- ii. I am a post graduate student

9. How many years have you been in the DIT?*

- i. Less than one year
- ii. 1 year
- iii. 2 years
- iv. 3 years
- v. 4 years
- vi. 5 or more years

Page Three

10. How much money is available to you in a typical week for drinking (related costs such as food and taxis included)?*

- i. I don't drink
- ii. €20 or less
- iii. €21-40
- iv. €41-60
- v. €61-80
- vi. €81-100
- vii. €101-120
- viii. €121-140
- ix. More than €140

11. How often in a typical month do you normally drink alcohol?*

- i. Never
- ii. Less than once a month
- iii. Once a month
- iv. 2-3 days a month
- v. Once a week
- vi. Twice a week
- vii. 3-4 days a week
- viii. 5-6 days a week
- ix. Everyday

12. How often in a typical month do you think *most students at DIT* normally drink alcohol?*

- i. Never
- ii. Less than once a month
- iii. Once a month
- iv. 2-3 days a month
- v. Once a week
- vi. Twice a week
- vii. 3-4 days a week
- viii. 5-6 days a week
- ix. Everyday

13. How often in a typical month do you think your *close friends* normally drink alcohol?*

- i. Never
- ii. Less than once a month
- iii. Once a month
- iv. 2-3 days a month
- v. Once a week
- vi. Twice a week
- vii. 3-4 days a week
- viii. 5-6 days a week
- ix. Everyday

14. How often in a typical month do you think your *best friend* normally drinks alcohol?*

- i. Never
- ii. Less than once a month
- iii. Once a month
- iv. 2-3 days a month
- v. Once a week
- vi. Twice a week
- vii. 3-4 days a week
- viii. 5-6 days a week
- ix. Everyday

15. How often in a typical month do you think your *mother* normally drinks alcohol?*

Please select the last option if this question is not applicable to you.

- i. Never
- ii. Less than once a month
- iii. once a month
- iv. 2-3 days a month
- v. Once a week
- vi. Twice a week
- vii. 3-4 days a week
- viii. 5-6 days a week
- ix. Everyday
- x. Not applicable

16. How often in a typical month do you think your *father* normally drinks alcohol?*

Please select the last option if this question is not applicable to you

- i. Never
 - ii. Less than once a month
 - iii. Once a month
 - iv. 2-3 days a month
 - v. Once a week
 - vi. Twice a week
 - vii. 3-4 days a week
 - viii. 5-6 days a week
 - ix. Everyday
 - x. Not applicable
-

Page Four

As you are probably aware, different alcoholic drinks have different quantities of alcohol.

For the purpose of the following questions (17-23), please estimate 1 pint of beer or cider as the equivalent of 2 drinks and all other drinks (glass of wine, spirits or shots) as the equivalent of 1 drink each.

Thus, somebody who has consumed 3 pints of beer and a glass of wine has consumed the equivalent of 7 drinks i.e. each pint is two drinks (3x2) plus 1 glass of wine (1 drink) leads to a total of 7 drinks.

17. Based on the above values, approximately how many alcoholic drinks do you normally drink on a typical drinking occasion?*

- i. 0
- ii. 1-2
- iii. 3-4
- iv. 5-6
- v. 7-8
- vi. 9-10
- vii. 11-12
- viii. 13-14
- ix. 15 or more

Remember, 1 pint is the equivalent of 2 drinks; all other beverage is the equivalent of 1 drink each.

18. Based on the above values, approximately how many alcoholic drinks do you normally drink on a typical college night? A college night is when you have college/classes the next morning*

- i. 0
- ii. 1-2
- iii. 3-4
- iv. 5-6
- v. 7-8
- vi. 9-10
- vii. 11-12
- viii. 13-14
- ix. 15 or more

Remember, 1 pint is the equivalent of 2 drinks; all other beverage is the equivalent of 1 drink each.

19. Based on the above values, approximately how many alcoholic drinks do you think *most students at DIT* normally drink on a typical drinking occasion?*

- i. 0
- ii. 1-2
- iii. 3-4
- iv. 5-6
- v. 7-8
- vi. 9-10
- vii. 11-12
- viii. 13-14
- ix. 15 or more

Remember, 1 pint is the equivalent of 2 drinks; all other beverage is the equivalent of 1 drink each.

20. Based on the above values, approximately how many alcoholic drinks do you think your *close friends* normally drink on a typical drinking occasion?*

- i. 0
- ii. 1-2
- iii. 3-4
- iv. 5-6
- v. 7-8
- vi. 9-10
- vii. 11-12
- viii. 13-14
- ix. 15 or more

Remember, 1 pint is the equivalent of 2 drinks; all other beverage is the equivalent of 1 drink each.

21. Based on the above values, approximately how many alcoholic drinks do you think your *best friend* normally drinks on a typical drinking occasion?*

- i. 0
- ii. 1-2
- iii. 3-4
- iv. 5-6
- v. 7-8
- vi. 9-10
- vii. 11-12
- viii. 13-14
- ix. 15 or more

Remember, 1 pint is the equivalent of 2 drinks; all other beverage is the equivalent of 1 drink each.

22. Based on the above values, approximately how many alcoholic drinks do you think your *mother* normally drinks on a typical drinking occasion?

*Please select the last option if the question is not applicable to you.**

- i. 0
- ii. 1-2
- iii. 3-4
- iv. 5-6
- v. 7-8
- vi. 9-10
- vii. 11-12
- viii. 13-14
- ix. 15 or more
- x. Not applicable

Remember, 1 pint is the equivalent of 2 drinks; all other beverage is the equivalent of 1 drink each.

23. Based on the above values, approximately how many alcoholic drinks do you think your father normally drinks on a typical drinking occasion?

*Please select the last option if the question is not applicable to you.**

- i. 0
- ii. 1-2
- iii. 3-4
- iv. 5-6
- v. 7-8
- vi. 9-10
- vii. 11-12
- viii. 13-14
- ix. 15 or more
- x. Not applicable

Page Five

24. How often in the course of a typical month do you drink enough alcohol to become drunk?*

- i. Never
- ii. Less than once a month
- iii. Once a month
- iv. 2-3 days a month
- v. Once a week
- vi. Twice a week
- vii. 3-4 days a week
- viii. 5-6 days a week
- ix. Everyday

25. How often in the course of a typical month do you think *most students at DIT* drink enough alcohol to become drunk?*

- i. Never
- ii. Less than once a month
- iii. Once a month
- iv. 2-3 days a month
- v. Once a week
- vi. Twice a week
- vii. 3-4 days a week
- viii. 5-6 days a week
- ix. Everyday

26. How often in the course of a typical month do you think your *close friends* drink enough alcohol to become drunk?*

- i. Never
- ii. Less than once a month
- iii. Once a month
- iv. 2-3 days a month
- v. Once a week
- vi. Twice a week
- vii. 3-4 days a week
- viii. 5-6 days a week
- ix. Everyday

27. How often in the course of a typical month do you think your **best friend drinks enough alcohol to become drunk?***

- i. Never
- ii. Less than once a month
- iii. Once a month
- iv. 2-3 days a month
- v. Once a week
- vi. Twice a week
- vii. 3-4 days a week
- viii. 5-6 days a week
- ix. Everyday

28. How often in the course of a typical month do you think your **mother drinks enough alcohol to become drunk?***

Please select the last option if this question is not applicable to you.

- i. Never
- ii. Less than once a month
- iii. Once a month
- iv. 2-3 days a month
- v. Once a week
- vi. Twice a week
- vii. 3-4 days a week
- viii. 5-6 days a week
- ix. Everyday
- x. Not applicable

29. How often in the course of a typical month do you think your *father* drinks enough alcohol to become drunk?*

Please select the last option if this question is not applicable to you.

- i. Never
 - ii. Less than once a month
 - iii. Once a month
 - iv. 2-3 days a month
 - v. Once a week
 - vi. Twice a week
 - vii. 3-4 days a week
 - viii. 5-6 days a week
 - ix. Everyday
 - x. Not applicable
-

Page Six

30. How old were you when you had your first drink (other than just a sip)?*

- i. Never had a drink
- ii. 11 years or younger
- iii. 12 years
- iv. 13 years
- v. 14 years
- vi. 15 years
- vii. 16 years
- viii. 17 years
- ix. 18 years or above

31. How many people do you usually drink with on a typical occasion?*

- i. I don't drink
- ii. Alone
- iii. 1
- iv. 2-3
- v. 4-5
- vi. 6-7
- vii. 8-9
- viii. 10 or above

32. Please select all that apply. The people that I typically drink with mostly include my*

- i. Boy friend/ Girl friend
- ii. Class mates
- iii. Flat mates
- iv. Friends from college
- v. Friends from outside college
- vi. Work mates
- vii. Siblings
- viii. Parents
- ix. I don't drink

33. How often in a typical week do alcohol/drinking come up in your conversations with others?*

Think about casual and informal conversations you have with people on day to day basis. For example, After a night out with friends, setting status messages or exchanging comments on facebook or bebo, exchanging emails or text messages, twitter, over dinner at home etc

- i. Several times a day
- ii. 2-3 times a day
- iii. About once a day
- iv. A few times a week
- v. Once a week
- vi. Never

34. How frequently does alcohol/drinking usually come up in your conversations with others?*

Think about casual and informal conversations you have with people on day to day basis. For example, After a night out with friends, setting status messages or exchanging comments on facebook or bebo, exchanging emails or text messages, twitter, over dinner at home etc

- i. Very Frequently
 - ii. Frequently
 - iii. Occasionally
 - iv. Rarely
 - v. Very Rarely
 - vi. Never
-

Page Seven

35. *Most students at DIT* think that drinking to get drunk is acceptable*

- i. Strongly disagree
- ii. Disagree
- iii. Neither disagree nor Agree
- iv. Agree
- v. Strongly Agree

36. *Most students at DIT* think that drinking to get drunk on a college night is acceptable*. A college night is when you have college/classes the next morning.

- i. Strongly disagree
- ii. Disagree
- iii. Neither disagree nor Agree
- iv. Agree
- v. Strongly Agree

37. My *close friends* would approve of me drinking to get drunk*

- i. Strongly disagree
- ii. Disagree
- iii. Neither disagree nor Agree
- iv. Agree
- v. Strongly Agree

38. My *close friends* would approve of me drinking to get drunk on a college night*. A college night is when you have college/classes the next morning

- i. Strongly disagree
- ii. Disagree
- iii. Neither disagree nor Agree
- iv. Agree
- v. Strongly Agree

39. My *best friend* would approve of me drinking to get drunk*

- i. Strongly disagree
- ii. Disagree
- iii. Neither disagree nor Agree
- iv. Agree
- v. Strongly Agree

40. My *best friend* would approve of me drinking to get drunk on a college night*. A college night is when you have college/classes the next morning

- i. Strongly disagree
- ii. Disagree
- iii. Neither disagree nor Agree
- iv. Agree
- v. Strongly Agree

41. My *mother* thinks that my drinking to get drunk is* *Please select the last option if the question is not applicable to you.*

- i. Very unacceptable
- ii. Unacceptable
- iii. Neither unacceptable nor acceptable
- iv. Acceptable
- v. Very acceptable
- vi. Not Applicable

42. My *mother* thinks that my drinking to get drunk on a college night is* A college night is when you have college/classes the next morning.

Please select the last option if the question is not applicable to you.

- i. Very unacceptable
- ii. Unacceptable
- iii. Neither unacceptable nor acceptable
- iv. Acceptable
- v. Very acceptable
- vi. Not Applicable

43. My *father* thinks that my drinking to get drunk is* *Please select the last option if the question is not applicable to you.*

- i. Very unacceptable
- ii. Unacceptable
- iii. Neither unacceptable nor acceptable
- iv. Acceptable
- v. Very acceptable
- vi. Not Applicable

44. My *father* thinks that my drinking to get drunk on a college night is* A college night is when you have college/classes the next morning. *Please select the last option if the question is not applicable to you.*

- i. Very unacceptable
- ii. Unacceptable
- iii. Neither unacceptable nor acceptable
- iv. Acceptable
- v. Very acceptable
- vi. Not Applicable

Page Eight

45. Please enter your email address in the space provided.*

Please enter an email address that you can be contacted on.

Your email address will not be passed on to anyone else and you will not be contacted for any promotional schemes or sent any spam mail.

It is being asked so that you might be contacted in case you win the Apple iPad after the raffle. This is subject to presentation of a valid DIT student ID.

You might also be contacted for an interview relating to the second phase of this research. However, you can choose not to participate at that stage if you so wish.

Winning an iPad is not dependent upon taking part in the 2nd phase. You can still say 'No' if you win the iPad.

46. Please enter your Student ID or your DIT email address.*

This survey and the related incentive are meant only for DIT students. Your student number/DIT email address is required as a means to verify that you are a DIT student. It will not be passed on to anyone else including other students, faculty or the administrative staff at DIT.

47. Which course/programme are you enrolled into at DIT? e.g. Bachelor of Engineering (Civil)*

Thank You!

Thank you for taking our survey. Your response is very important to us.

Appendix 6: Results of Independent t-test for Early and Late Respondents

Control variables						
	Timeliness	N	Mean	Std. Deviation	t	Sig. (2-tailed)
Gender	Early	1453	.57	.495	1.856	0.064
	Late	247	.51	.501		
Age	Early	1453	21.10	2.941	-1.17	0.241
	Late	247	21.31	2.521		
Living Arrangement	Early	1453	1.68	1.004	1.86	0.069
	Late	247	1.54	.948		
Year in college	Early	1453	1.59	1.562	-1.16	0.24
	Late	247	2.31	1.656		
Money available for drinking	Early	1453	45.96	34.407	1.406	0.177
	Late	247	52.69	34.667		
Age of first drink	Early	1453	14.63	2.826	-1.17	0.241
	Late	247	15.00	1.571		
Drinking group size	Early	1453	1.64	21.743	-1.175	0.241
	Late	247	4.61	13.536		
Weekly communication about alcohol	Early	1453	2.43	1.253	0.466	0.641
	Late	247	2.39	1.251		
General communication about alcohol	Early	1453	3.24	.974	-0.01	0.992
	Late	247	3.24	.949		

Frequency of Drinking (typical month)

	Timeliness	N	Mean	Std. Deviation	t	Sig.(2-tailed)
Frequency of Drinking (typical month)	Early	1453	4.90	3.740	-.225	.822
	Late	247	4.96	3.259		
Perceived Norm (most students at DIT)	Early	1453	8.53	3.892	.614	.539
	Late	247	8.37	3.744		
Perceived Norm (Close friends)	Early	1453	7.35	4.055	.839	.402
	Late	247	6.50	3.442		
Perceived Norm (Best friend)	Early	1453	6.64	4.626	1.041	.299
	Late	247	5.99	3.843		
Perceived Norm (Mother)	Early	1424	5.15	6.547	-.391	.696
	Late	246	5.32	5.997		
Perceived Norm (Father)	Early	1343	7.03	7.679	-.262	.793
	Late	229	7.17	7.193		

Number of Drinks

	Timeliness	N	Mean	Std. Deviation	t	Sig. (2-tailed)
Number of Drinks (Typical occasion)	Early	1452	8.64	4.687	-1.067	.286
	Late	247	8.98	4.319		
Number of Drinks (Typical college night)	Early	1452	6.22	5.042	-1.464	.143
	Late	247	6.73	4.775		
Perceived Norm (most students at DIT)	Early	1452	9.71	3.782	-.841	.401
	Late	247	9.93	3.858		
Perceived Norm (Close friends)	Early	1452	9.56	4.235	-.665	.506
	Late	247	9.75	4.165		
Perceived Norm (Best friend)	Early	1452	9.00	4.604	-.517	.605
	Late	247	9.17	4.509		
Perceived Norm (Mother)	Early	1404	2.96	2.644	-1.619	.106
	Late	246	3.37	2.614		
Perceived Norm (Father)	Early	1327	4.91	4.092	-1.619	.106
	Late	229	5.39	4.054		

Frequency of Drunkenness (Typical month)

	Timeliness	N	Mean	Std. Deviation	t	Sig. (2-tailed)
Frequency of Drunkenness (Typical month)	Early	1452	3.23	3.137	-1.157	.248
	Late	247	3.44	2.504		
Perceived Norm (most students at DIT)	Early	1452	6.13	3.456	-.284	.776
	Late	247	6.20	3.388		
Perceived Norm (Close friends)	Early	1452	5.05	3.428	.839	.402
	Late	247	4.85	3.158		
Perceived Norm (Best friend)	Early	1452	4.56	3.836	1.041	.299
	Late	247	4.32	3.244		
Perceived Norm (Mother)	Early	1407	1.06	3.167	-1.350	.177
	Late	245	1.36	3.379		
Perceived Norm (Father)	Early	1322	1.94	4.477	-.221	.825
	Late	228	2.01	3.718		

Perceived Injunctive Norms						
	Timeliness	N	Mean	Std. Deviation	t	Sig. (2-tailed)
Most students at DIT think that drinking to get drunk is acceptable	Early	1453	3.89	.872	-.949	.343
	Late	247	3.94	.863		
My close friends would approve of me drinking to get drunk	Early	1453	3.79	.973	-.294	.769
	Late	247	3.81	.914		
My best friend would approve of me drinking to get drunk	Early	1453	3.72	1.074	-.454	.650
	Late	247	3.75	1.001		
My mother thinks that my drinking to get drunk is	Early	1363	2.48	.916	-1.680	.093
	Late	231	2.59	.928		
My father thinks that my drinking to get drunk is	Early	1278	2.61	.972	1.085	.278
	Late	216	2.53	.935		

Appendix 7: Assumption Testing

Quantitative models always rest on assumptions about the way things work, regression models are no exception. As explained in the main document, three sets of regression were performed in this study one for each dependant variable. In each case, after having settled for a set of key variables which were both statistically significant and intuitively meaningful from the knowledge of the problem, the following steps were taken to test the adequacy of the regression assumptions.

1. The assumption of multicollinearity

Multicollinearity is a condition in which the Independent variables (IVs) are very highly correlated (.90 or greater) (Tabachnick and Fidell, 1989). It can be caused by high bivariate correlations. Statistically, multicollinearity is unwanted because calculation of the regression coefficients is done through matrix inversion. Consequently, if it exists the inversion is unstable. Logically, multicollinearity is not wanted because if it exists, then the IVs are redundant with one another. In such a case, one IV doesn't add any predictive value over another IV, but you do lose a degree of freedom. As such, having multicollinearity can weaken the analysis (Tabachnick and Fidell, 1989).

In SPSS, requesting collinearity diagnostics as part of standard regression output returns VIF (Variance inflation factor) and tolerance values. High values of VIF and low tolerance values indicate serious multicollinearity issues. As a rule of thumb, VIF values close to 10 and tolerance values close to 0 are indicative of such a problem. The three tables that follow indicate these values for the full models run for each dependant variable (DV). As can be verified from the table, there were no multicollinearity issues.

Collinearity Diagnostics for DV: frequency of drinking in a typical month		
Block 5	Tolerance	VIF
Gender	0.890	1.124
living in a shared accommodation	0.282	3.541
living with parents	0.276	3.629
Money available for drinking	0.912	1.097
Age of first drink	0.905	1.104
Drinking Group Size	0.894	1.119
Weekly communication about alcohol	0.603	1.659
Communication about alcohol in general	0.608	1.645
Injunctive norm for most students at DIT*	0.721	1.386
Injunctive norm for close friends*	0.347	2.880
Injunctive norm for best friend *	0.358	2.794
Injunctive norm for mother*	0.509	1.964
Injunctive norm for father*	0.415	2.411
Descriptive norm for most students at DIT*	0.802	1.247
Descriptive norm for close friends*	0.608	1.646
Descriptive norm for best friend *	0.648	1.543
Descriptive norm for mother*	0.582	1.720
Descriptive norm for father*	0.590	1.695
Interaction term for close friends (DN*IN)	0.795	1.258
Interaction term for best friend (DN*IN)	0.808	1.237

IN: Injunctive Norm, DN: Descriptive Norm, * variable centered around the mean

Table 1: Collinearity Diagnostics for DV: frequency of drinking in a typical month

Collinearity Diagnostics for DV: No. of drinks on a typical drinking occasion		
Block 5	Tolerance	VIF
Gender	0.758	1.319
Money available for drinking	0.900	1.111
Age of first drink	0.893	1.120
Weekly communication about alcohol	0.627	1.596
Communication about alcohol in general	0.627	1.594
Injunctive norm for most students at DIT*	0.724	1.381
Injunctive norm for close friends*	0.342	2.925
Injunctive norm for best friend *	0.332	3.016
Injunctive norm for mother*	0.498	2.009
Injunctive norm for father*	0.500	2.001
Descriptive norm for most students at DIT*	0.454	2.203
Descriptive norm for close friends*	0.199	5.014
Descriptive norm for best friend *	0.231	4.328
Descriptive norm for mother*	0.703	1.421
Descriptive norm for father*	0.666	1.501
Interaction term for close friends (DN*IN)	0.541	1.849
Interaction term for best friend (DN*IN)	0.552	1.812

IN: Injunctive Norm, DN: Descriptive Norm, * variable centered around the mean

Table 2: Collinearity Diagnostics for DV: No. of drinks on a typical drinking occasion

Collinearity Diagnostics for DV: Frequency of Drunkenness in a typical month		
Block 4	Tolerance	VIF
Age	0.83	1.21
Gender	0.89	1.12
Money available for drinking	0.88	1.14
Age first	0.91	1.10
Weekly communication about alcohol	0.58	1.72
Communication about alcohol in gen	0.61	1.63
Injunctive norm for most students at DIT*	0.73	1.38
Injunctive norm for close friends*	0.34	2.98
Injunctive norm for best friend *	0.35	2.84
Injunctive norm for mother*	0.55	1.82
Injunctive norm for father*	0.55	1.83
Descriptive norm for most students at DIT*	0.70	1.44
Descriptive norm for close friends*	0.43	2.31
Descriptive norm for best friend *	0.51	1.98
Interaction term for close friends (DN*IN)	0.65	1.53
Interaction term for best friend (DN*IN)	0.70	1.43

IN: Injunctive Norm, DN: Descriptive Norm, * variable centered around the mean

Table 3: Collinearity Diagnostics for DV: Frequency of Drunkenness in a typical month

2. The assumption of linearity

Standard multiple regression can only accurately estimate the relationship between the dependent and independent variables if the relationships are linear in nature (Ostrom Jr, 1990). It is imperative to examine linearity as there are many instances in social sciences where non-linear relationships occur. If the relationship between the independent variables (IV) and the dependent variable (DV) is not linear, the results of the regression analysis might *under-estimate* the true relationship. This under-estimation carries two risks: an increased chance of a Type II error for the IV being examined, and in the case of multiple regressions, an increased risk of Type I errors (over-estimation) for other IVs that share variance with the IV being examined.

The literature suggests three primary ways to detect non-linearity (Berry and Feldman, 1990, Cohen et al., 1983, Cohen et al., 2007, Pedhazur, 1997). The first method is related to the use of theory or previous research to inform current analyses. The design of the current study is theoretically informed by past research and the measures used in this study are validated by similar studies such as (Beck and Treiman, 1996, McAlaney and McMahon, 2007, Perkins, 2007, Rimal, 2008, Mallett et al., 2009). Therefore the first method lends adequate confidence in assuming linearity among the variables. However, it is possible that prior researchers might have overlooked the possibility of non-linear relationships. Therefore, a preferable method of detecting non-linearity is the examination of residual plots (plots of the standardized residuals as a function of the standardized predicted values). The residual plots for each DV showing a linear relationship are presented next.

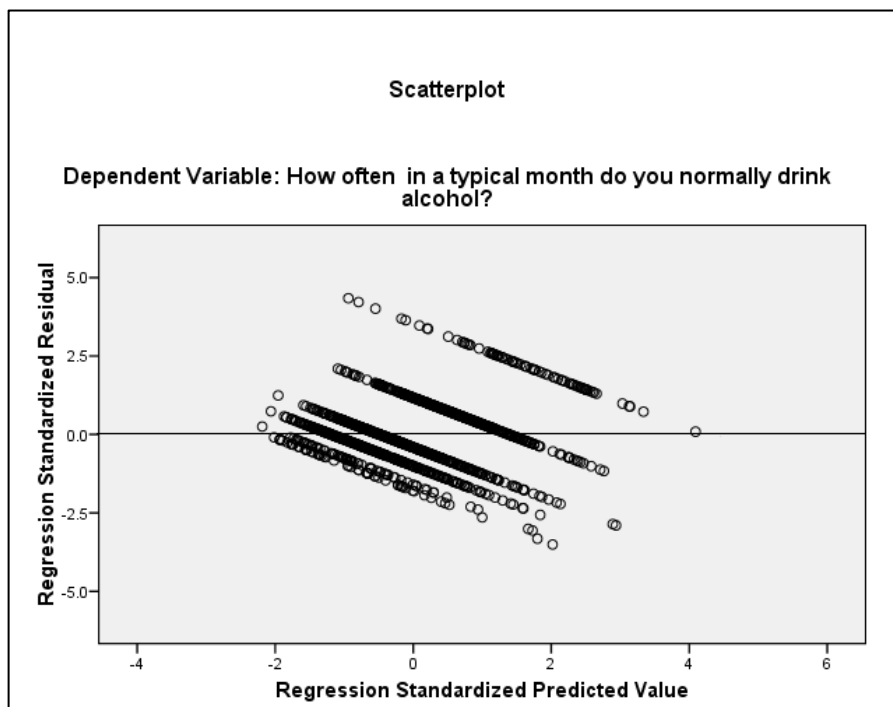


Figure 1: Residual plot for the frequency of drinking in a typical month

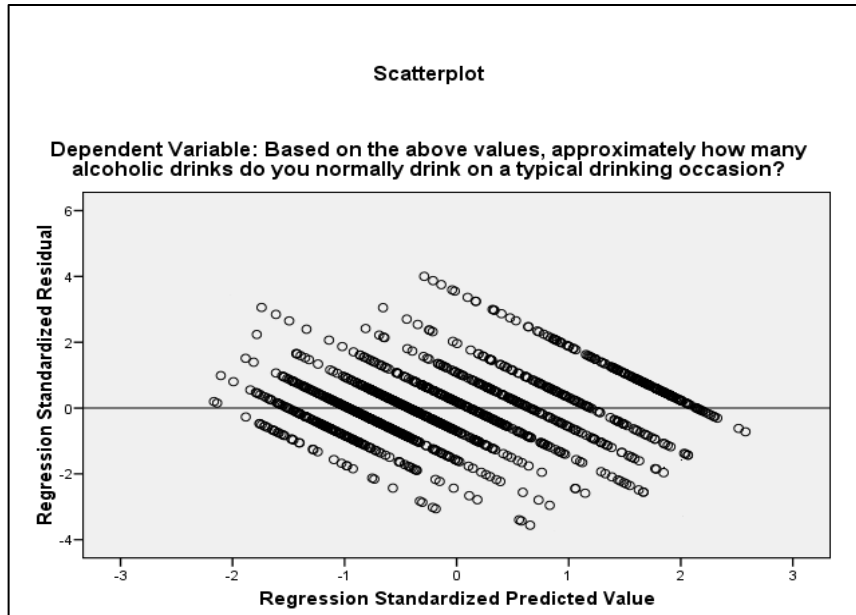


Figure 2: Residual plot for the number of drinks on a typical drinking occasion

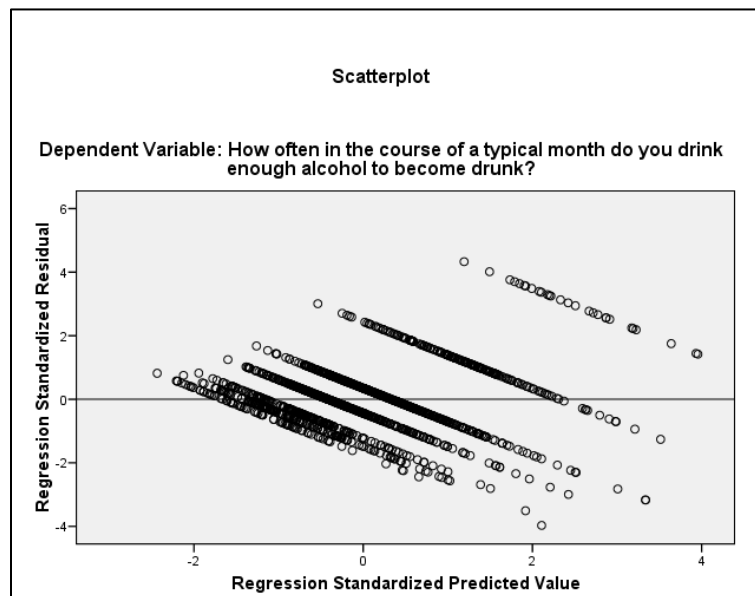


Figure 3: Residual plot for the frequency of drunkenness in a typical month

3. The Assumption of Homoscedasticity

Homoscedasticity means that the variance of the errors is the same across all levels of the independent variables (Ostrom Jr, 1990). When the assumption is violated, it is called

heteroscedasticity. This assumption can be checked by visual examination of a plot of the standardized residuals (the errors) by the regression standardized predicted values as has been done in the preceding section. Ideally, residuals are randomly scattered around 0 (the line of total fit) providing a relatively even distribution. Heteroscedasticity is indicated when the residuals are not evenly scattered around the line. There are many forms heteroscedasticity can take, such as a bow-tie or fan shape. When the plot of residuals appears to deviate substantially from normal, more formal tests for heteroscedasticity should be performed. Possible tests for this are the Goldfeld-Quandt test when the plot resembles a fan shape or the Glejser tests when the plot resembles a bowtie (Berry and Feldman, 1990). That is not the case here. From the plots above one might infer that slight heteroscedasticity is present. However, based on the literature, it is not large enough to cause major distortion of results (Miles and Shevlin, 2001). The literature suggests that when heteroscedasticity is present, the parameter estimates are correct i.e. not biased. It is the standard errors and hence the p values that are incorrect. That being said if there is no skew in the predicted scores, the p values can be considered to be reasonably accurate (Miles and Shevlin, 2001). For confirmation the standardized predicted scores were saved as an output of regression and examined for skewness which was well within the range of +/-2. As a further step, the plots of standardized residuals with key independent variables (namely the injunctive and the descriptive norms) were also examined. The plots suggested that they were not heteroscedastic. According to Berry and Feldman (1990) and Tabachnick and Fidell (1989) slight heteroscedasticity has little effect on significance tests; however, when heteroscedasticity is marked it can lead to serious distortion of findings and seriously weaken the analysis thus increasing the possibility of a Type I error. In fact a number of statisticians have frequently found ANOVA and the procedures of regression to be *robust* to the assumptions of homogeneity

of variance (equal variance) and normality (Box, 1953, Lorenzen and Anderson, 1993, Van Belle, 2008). Allison (1999) quotes

“My own experience with heteroscedasticity is that it has to be pretty severe before it leads to serious bias in the standard errors. Although it is certainly worth checking, I wouldn’t get overly anxious about it” (p 128)

4. The Assumption of nonstochastic X

This assumption implies that the error terms should be uncorrelated with the individual predictors (Ostrom Jr, 1990). This was tested by running correlations of saved standardized residuals with all the predictors in the model for each dependant variable. The resulting correlation coefficients were had zero values indicating no correlation.

5. The Assumption of zero mean

This assumption implies that the mean of the error term should be zero (Ostrom Jr, 1990). This is not a problem because the least squares method of estimating regression equations guarantees that the mean is zero. This was also verified from the residual descriptive for all DVs.

6. The Assumption of normality

One of the assumptions of regression is that residuals should be normally distributed at each value of the dependant variable. There is a lack of consensus on how best to decide whether a variable is normally distributed or not. Statisticians generally use one or more of the following three criteria

- Eye balling the histograms with superimposed normal curves
- Examining the values for skewness and kurtosis with predefined acceptable boundaries
- Employing formal normality tests

A range of formal tests such as the Shapiro-Wilk test and the Kolmogorov-Smirnov test are available for testing normality. While these normality tests are useful they are not infallible. Most of these tests are sensitive to the sample sizes. For large samples, for example 1000 observations or more, most normality tests become very sensitive and might regard a small deviation from normality as being significant (Pedhazur, 1997). Therefore, as the sample size increases so does the likelihood of rejecting a distribution that deviates only slightly from normality. It is to be remembered that true normality is relatively rare in psychology (Micceri, 1989). Researchers also generally agree that the larger the sample size, the less deviations from normality matter (Miles and Shevlin, 2001).

Therefore, the criterion used in this study to assess the normality of residuals relied upon examining the histograms and skew and kurtosis values. Some texts suggest that you divide the skew and kurtosis values by their standard errors to get z-scores and then examine if they fall within the set boundaries. Unfortunately as the standard errors are directly related to sample size in large samples most variables will fail these tests even though the variables may not differ from normality by enough to make any real difference (Harrington, 2008). Given the large sample size of this study, it was decided to be guided by the histogram and the absolute sizes of the skew and kurtosis values (within +/-2) based on suggestions by Kendal and Stuart (1967) and Miles and Shevlin (2001). Absolute values above 2 were decided to likely indicate substantial non-normality.

DV: Frequency of drinking in a typical month

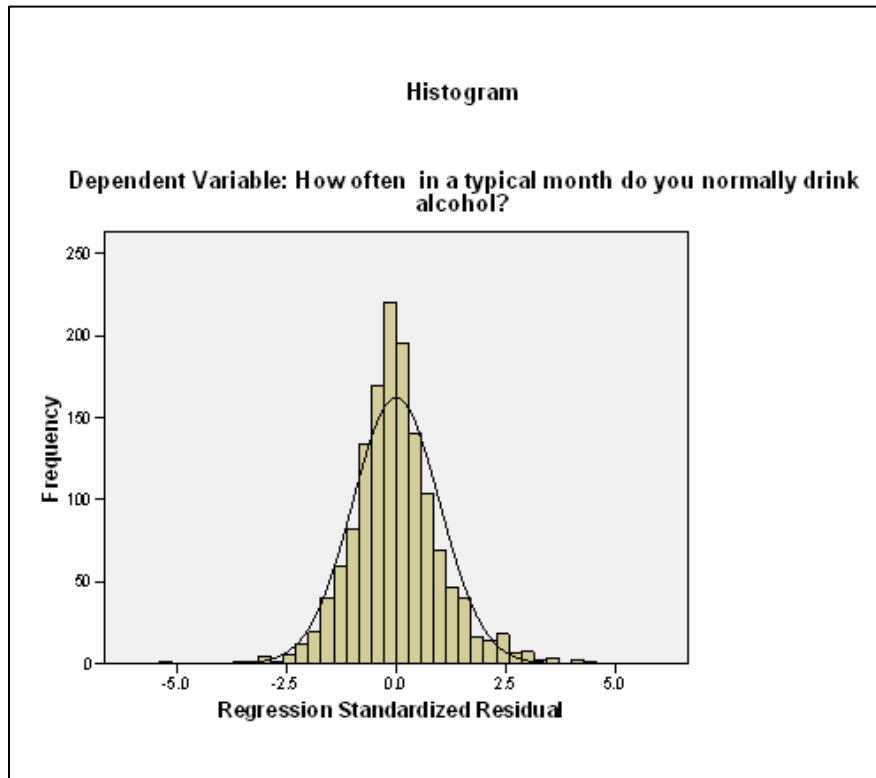


Figure 4: Histogram of standardized residuals (DV: Frequency of drinking in a typical month)

The histogram indicates that the underlying distribution is fairly normal. As a further check for normality, P-P plot and Q-Q plot of normality were plotted. They indicated slight deviation from normality at the upper end. However, the deviation is not huge. These values are not outliers. These are genuine data and it was not deemed wise to remove it or manipulate it in an unreasonable manner.

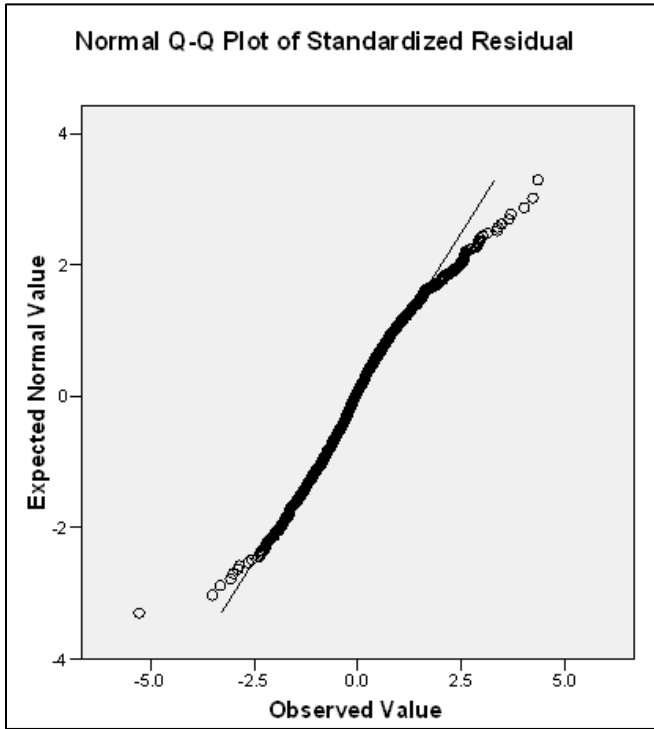
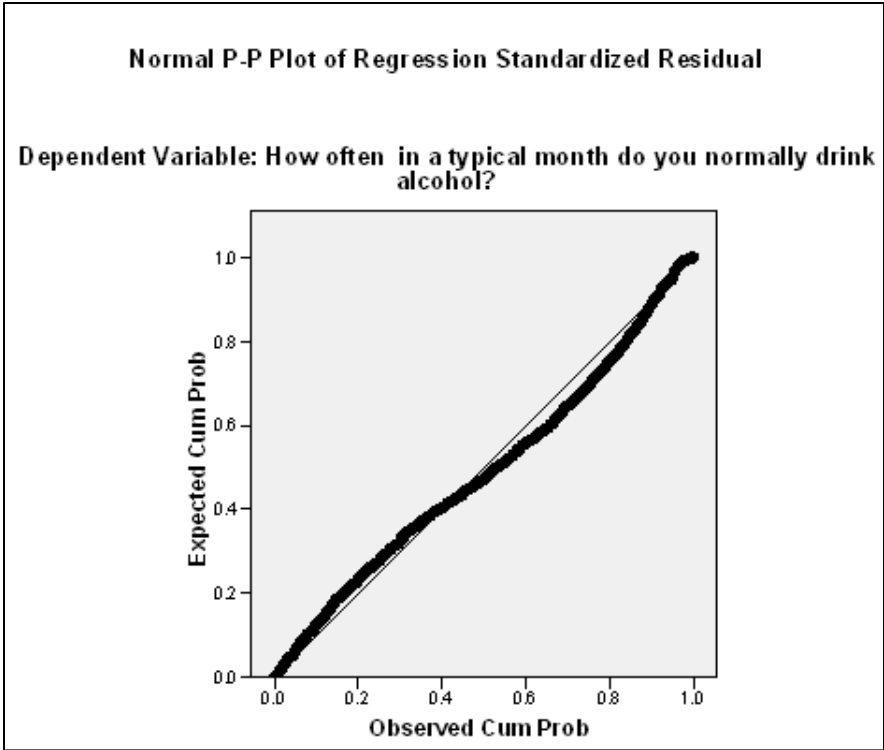


Figure 5: P-P plot and Q-Q plot of standardized residuals (DV: Frequency of drinking in a typical month)

The skewness and kurtosis values of the standardized residuals were 0.3 (Se: 0.064) and 1.8 (SE: 0.127) respectively well within the acceptable range.

In order to further assess this situation and bring the distribution further closer to normality, square root transformation was applied to the DV. This did not bring a significant change in the skewness but brought the kurtosis value down to 1.5. The P-P plot now indicates a very normal distribution

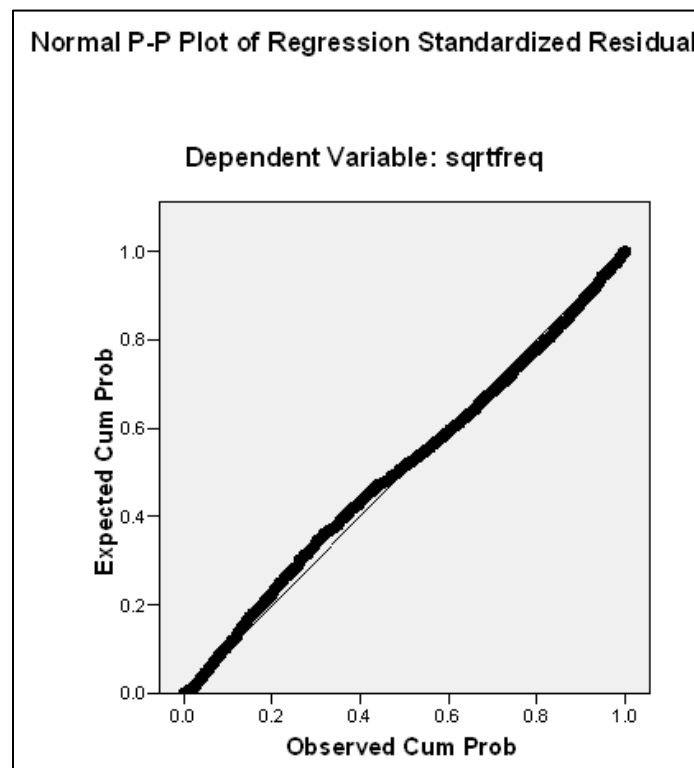


Figure 6: P-P plot of standardized residuals (DV: Square rooted frequency of drinking in a typical month)

There wasn't much difference in the regression results after applying the transformation and therefore non transformed values are reported in the main document for ease of interpretation.

DV: Number of drinks on a typical occasion

The histogram suggests that the underlying distribution is close to normal.

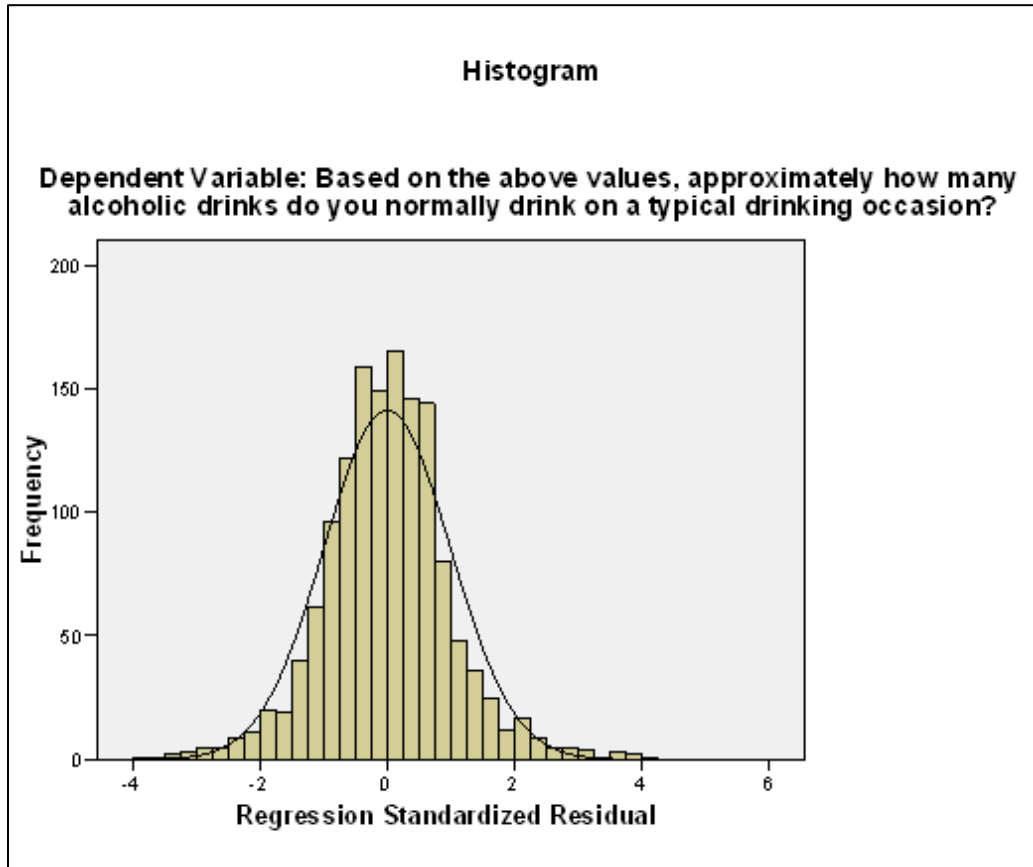


Figure 7: Histogram of standardized residuals (DV: Number of drinks on a typical occasion)

However as a further check, the normal P-P plot of standardized residuals was examined.

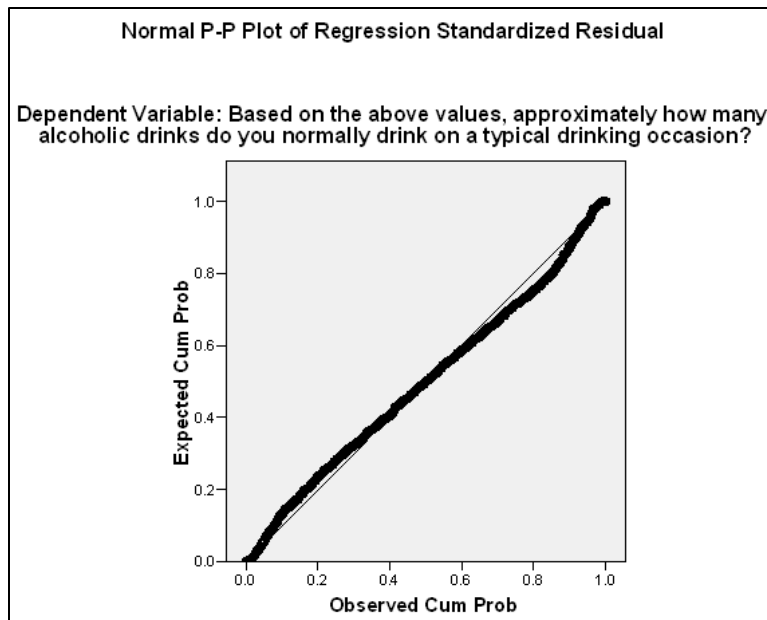


Figure 8: P-P plot of standardized residuals (DV: Number of drinks on a typical drinking occasion)

As can be seen from the plot, it follows the straight line very closely.

Though the histogram and the P-P plot of the standardized residuals looked quite reasonable, the descriptive values for the residuals were also examined for skewness and kurtosis to make sure that the distribution did not deviate substantially from a normal curve. The residuals were not overly skewed (skewness: 0.205, SE= 0.065) however, the kurtosis value slightly exceeded the set criteria of +/-2 (Kurtosis: 2.07, SE=0.128). In order to resolve this issue, the standardized residuals were examined for cases beyond +/-4 standard deviations. 4 such cases were found. These 4 cases were excluded from regression and the model was rerun. Given the same results (except that R square=72.6 for model 2) these cases were kept excluded for the rest of the analysis for this dependant variable. The value for kurtosis was now 1.4 (Se.0.128) and Skewness was 0.09 (SE: 0.064). Both were now within the acceptable range.

DV: Frequency of Drunkenness

Initially, when the standardized residuals were examined, the skewness and kurtosis were noted to be 0.6 (SE: 0.065) and 3.08 (SE: 0.129). The value for kurtosis exceeds the acceptable range of ± 2 . To rectify this, standardized residuals outside ± 4 standard deviations were excluded. There were 6 such cases. Model 2 was rerun and it was noticed that removal of these cases improved the R square value by 2.5%. The reexamination of the standardized residuals revealed that the skewness and kurtosis values were now 0.3 (Se: 0.065) and 1.6 (SE: 0.129) respectively. The histogram of standard residuals follow.

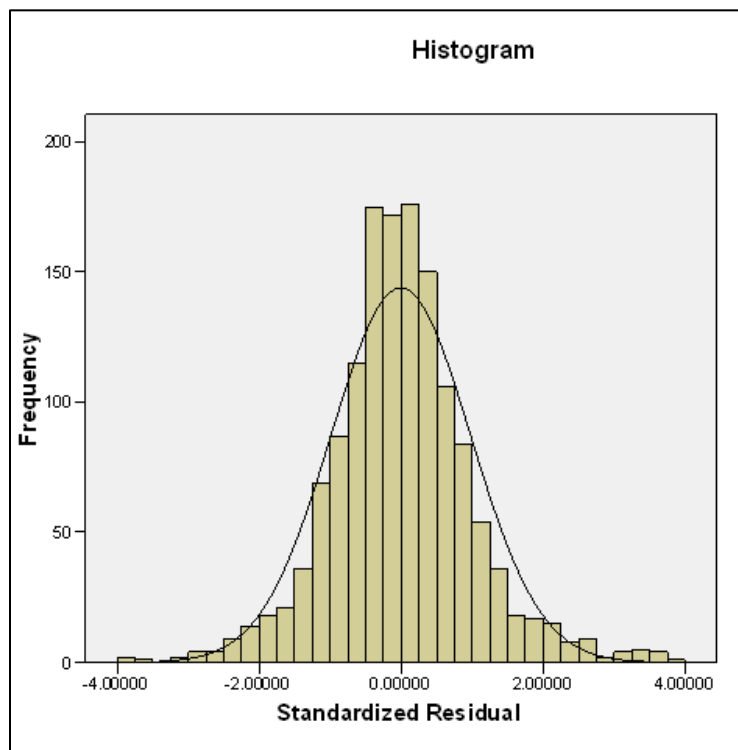


Figure 9: Histogram of standardized residuals within ± 4 st deviations (DV: Frequency of drunkenness in a typical month)

A square root transformation of the dependant variable was also attempted to bring down the value of kurtosis further. The values for skew and kurtosis were now -0.4 (SE: 0.065) and 0.5

(Se: 0.130) respectively. Given the same results and negligible increase in R square (0.9%) the untransformed values for regression coefficients are reported in the main document for ease of interpretation. The histogram, P-P plot and Q-Q plot for the residuals of the transformed DV are presented next.

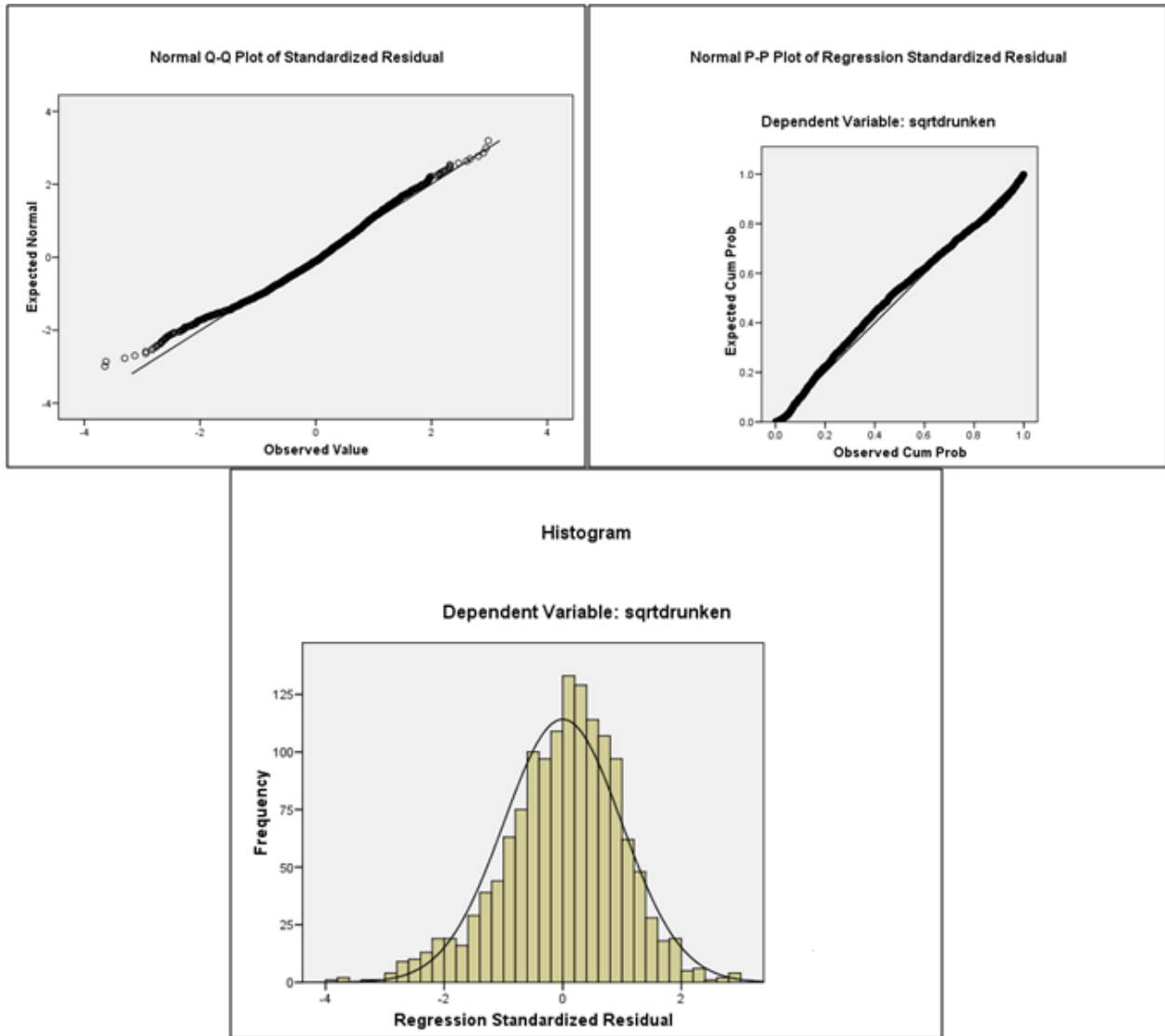


Figure 10: P-P plot, Q-Q plot and histogram of standardized residuals (DV: Square rooted frequency of drunkenness in a typical month)

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Appendix 8: Interview Guide

Opening Statement: Now that we have a list of names here, I want you to tell me about these people. You may start from anywhere you like and take your time. I'll listen first and try not to interrupt you. I might take some notes

Areas to be Explored

Relationships with network members

1. Formation of Relationship

Cue: Tell me about how you got to know each other

Cue: Can you talk about your experiences with ____

Probes:

- Can you tell me more about it?
- Can you talk about these common contacts (if ego mentions having common friends)
- Can you elaborate with an example?

2. Strength of Relationship (Formation, Duration, Communication, Intensity, Shared activities, Meaning of important matters and Exchange of support)

Main Cue: Can you talk about your relationship with ____?

Sub cues: Can you talk about how long have you known this person?

Can you talk about how close you feel towards this person? (Probe for examples)

Can you talk about how you communicate?(Probe for examples)

Can you talk about what activities you do together?(probe for examples)

Can you talk about what you mean by the important matters you discuss with ____

(Probe to explore if the exchange is reciprocal)

3. Ways of Socializing (Where and how)

Cue: Tell me what you do when you are together

Probe

- Can you tell me what usually happens at these occasions?
- Can you recall one of these occasions?
- Can you tell me where and when it usually happens
 - Weekends/weekdays, after classes, scheduled/unscheduled, common meeting places e.g. club meetings, society events etc., birthdays, class events, family events, others?

Drinking behavior of network members

1. Low, moderate or heavy

Cue: Some people drink a lot, others not so much, what are your thoughts about the drinking behavior of these people?

Probes:

- Can you tell me more about it?
- Can you tell me what you mean by that?
- Can you elaborate with an example?
- Can you think of an occasion when you felt that happened?
- How do you feel is he/she different/similar to you (if ego mentions being similar or different)

2. Development and practice of drinking behaviors

Cue: Tell me about the time when you started drinking with these people.

Probes:

- Can you elaborate with an example to help me understand?
- Do you recall an occasion when that happened?
- Can you describe how you felt at the time?
- Can you tell me what you mean by that?

3. Where, Why and How?

Probes:

- Can you talk about where it used to happen? (home, pubs/clubs, at a friend's place, sporting events/concerts, elsewhere)
- Tell me about what would usually happen at such an occasion?
- Drinking contexts: Parties, class nights out, club or society meetings, sporting events, general meet ups with friends, family events, special occasions
- Can you tell me more about these _____?

4. Approval/Disapproval towards drinking to get drunk

Cue: How do you think she/he feels about drinking to get drunk

Probes:

- Can you tell me more about it?
- Can you give an example of an occasion when....
- Can you tell me similar episodes when it happened?

5. Normative pressures to drink/feeling motivated or encouraged

Cue: Can you talk about your experiences of drinking with ____

Probes

- What happens when you drink together? How often?
- In what ways do you think he/she encourages you (ask if ego says he feels encouraged)
- Can you tell me what you mean by that?
- How do you feel about it?
- Why do you think it happens?
- Can you recall an occasion when that happened?

6. Family history of alcoholism, health issues, moral/religious issues

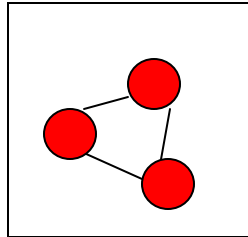
Probe

- Can you tell me what happened?
- Can you give an example or tell an episode when it happened?
- Can you tell me more about it?
- Can you tell me what you mean by that?
- How do you think he/she feels about it?
- How do you feel about it?(if the alter is a parent/sibling or someone very close)

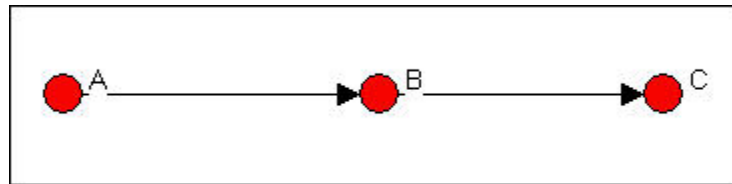
Appendix 9: Glossary of Common Terms used in Social Network Analysis

1. *Nodes or Actors*: Network members that can be distinct individuals (for example clients of a health service, residents of a neighbourhood), events, memberships or collective units (for example health organizations within a community).
2. *Ties*: Linkages between actors within a network. These can be informal (friendships) or formal (an organization funding another).
3. *Ego*: The focal individual or node whose personal network is under examination.
4. *Alters*: The nodes or actors an ego is directly connected to in an ego network.
5. *Role Relationships*: The relationship that an alter shares with the ego such as friend, parent, sibling, class mate, flat mate, cousin etc.
6. *Multiplexity*: When actors have multiple ties. (For example, a friend can be a neighbour and a class mate).
7. *Name Generators*: Asking a focal actor for the names of people to whom he or she is connected in a particular way.
8. *Name Interpreters*: Questions designed to elicit information about the named actors, their attributes, relations to focal actor and to other named alters.
9. *Graph*: Visual representation of actors showing actors as 'nodes' and relational ties as 'lines'.
10. *Sociogram*: A drawing that permits visualizing a personal network containing each alter's name and the ties among them.

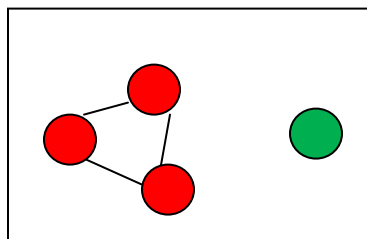
11. *Clique*: Maximum number of actors who have all possible ties present among themselves, such as the network below



12. *Liaison/Broker*: An actor who lies between a direct between two others such as node B in the example below



13. *Isolate*: An actor who is not connected to any other actor in a network such as the green node in the example below



Appendix 10: Tie Strength Scores

1.

<i>Respondent: Mary (Female, 20 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	31, 32, 33, 34, 35, 36
5	37, 38, 312, 313, 315, 317
4	39, 310, 311, 314, 316, 318, 319
3	320, 321, 322, 323, 324, 325, 326, 328
2	327, 329, 330, 331, 332

2.

<i>Respondent: Emma (Female, 20 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	41, 43, 44, 414
5	42, 411, 412, 415, 416
4	45, 46, 47, 48, 49, 410
3	413, 418, 419
2	417, 420

3.

<i>Respondent: Helen (Female, 20 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	51, 52, 53, 55, 57, 59, 520
5	54, 517, 519
4	56, 58, 510, 511, 514, 515, 516
3	512, 513, 518

4.

<i>Respondent: Ruth (Female, 22 years old, Low drinking cohort)</i>	
Tie Strength Scores	Alters
6	71, 72, 73, 74, 75, 76, 710, 711
4	77, 78, 79

5.

<i>Respondent: Linda (Female, 19 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	81, 82, 83, 85
5	84, 86, 87, 89
4	88, 812, 813, 816, 819
3	810, 811, 814, 815, 820
2	817

6.

<i>Respondent: Edel (Female, 19 years old, High drinking cohort)</i>	
Tie Strength Score	Alters
6	91, 92
5	93, 94, 96, 97
4	95, 98, 99, 910, 911
3	912, 913

7.

<i>Respondent: Sue (Female, 18 years old, High drinking cohort)</i>	
Tie Strength Score	Alters
6	1101, 1102, 1107
5	1103
4	1105, 1106
2	1104

8.

<i>Respondent: Pam (Female, 19 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	101, 102, 103, 107
5	104, 105, 106, 1014
4	1012, 1016, 1017
3	108, 109, 1011
2	1015
1	1010, 1013

9.

<i>Respondent: Debbie (Female, 21 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	1201, 1202, 1203, 1205
5	1204, 1207, 1208
4	1206, 1210
3	1209, 1211, 1212, 1213, 1216
2	1215
1	1214, 1217

10.

<i>Respondent: Meg (Female, 19 years old, Moderate drinking cohort)</i>	
Tie Strength Scores	Alters
6	1303, 1308
5	1301, 1302, 1303, 1305, 1312
4	1306, 1307, 1309, 1310, 1311
3	1313, 1314, 1315, 1316, 1317, 1318
2	1319

11.

<i>Respondent: Fay (Female, 21 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	1501, 1502, 1503, 1504, 1515, 1517
5	1505, 1506, 1510, 1511, 1512, 1513
4	1507, 1509
3	1508
2	1518, 1519
1	1514, 1516, 1520

12.

<i>Respondent: Bella (Female, 21 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	1701, 1703, 1705
5	1702, 1706
4	1704, 1707, 1708, 1709
3	1710

13.

<i>Respondent: Katie (Female, 19 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	1801, 1802
5	1803, 1804, 1805, 1809
4	1806, 1807, 1808, 1810, 1811, 1812, 1817
3	1816
2	1814, 1818
1	1813, 1815

14.

<i>Respondent: Amy (Female, 20 years old, Moderate drinking cohort)</i>	
Tie Strength Scores	Alters
6	1901, 1902, 1903, 1904
5	1910, 1911, 1912, 1915
4	1905, 1913, 1914, 1918, 1919
3	1906, 1907, 1908, 1909, 1917
2	1916, 1920

15.

<i>Respondent: Lisa (Female, 20 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2618
5	2611, 2617, 2619
4	2610, 2612, 2613, 2620
3	2614, 2616, 2621, 2623
2	2615, 2622, 2624
1	2609

16.

<i>Respondent: Tom (Male, 21 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	11, 12, 14, 15, 18
5	13, 111, 115
4	110, 112, 114, 118, 119, 120, 121
3	16, 17, 19, 113, 116, 117, 122, 123

17.

<i>Respondent: Peter (Male, 20 years old, Moderate drinking cohort)</i>	
Tie Strength Scores	Alters
6	21, 22, 23
5	210, 213
3	24, 211
2	27, 29
1	25, 26, 28, 212

18.

<i>Respondent: Sam (Male, 23 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	61,62, 63, 64, 65, 66, 611, 618
5	67, 68, 69
4	69, 613, 620, 625, 626
3	614, 615, 616, 619, 621, 624
2	610, 622, 623
1	612

19.

<i>Respondent: Alex (Male, 20 years old, Moderate Drinking Cohort)</i>	
Tie Strength Scores	Alters
6	1403
5	1404
4	1402
3	1401
2	1405

20.

<i>Respondent: John (Male, 22 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	1601, 1602, 1603, 1604, 1605, 1609, 1610, 1611, 1615, 1622
5	1606, 1607, 1608, 1612, 1619, 1620
4	1613, 1614, 1616, 1617
3	1618, 1621, 1623

21.

<i>Respondent: Adam (Male, 20 years old, Moderate drinking cohort)</i>	
Tie Strength Scores	Alters
5	2001, 2003, 2005
4	2002, 2004, 2006, 2008, 2009, 2013, 2014
3	2007, 2012, 2015, 2016, 2017, 2018
2	2010, 2011

22.

<i>Respondent: Brian (Male, 22 years old, High drinking cohort)</i>	
Tie Strength Scores	Alters
6	2102
5	2101, 2103, 2106
4	2105, 2107, 2108, 2109
3	2104, 2110, 2111, 2113
2	2112
1	2114

23.

<i>Respondent: Cormac (Male, 21 years old, Moderate drinking Cohort)</i>	
Tie Strength Scores	Alters
6	2201, 2202, 2217
5	2203, 2209, 2213
4	2206, 2207, 2208, 2216, 2218, 2219
3	2204, 2205, 2209, 2210, 2220, 2221
2	2212, 2214
1	2211, 2215

24.

<i>Respondent: Gary (Male, 23 years old, High drinking Cohort)</i>	
Tie Strength Scores	Alters
6	2301, 2304, 2307
5	2308, 2309
4	2310
3	2302, 2312
2	2306, 2311
1	2303, 2305

25.

<i>Respondent: Rob (Male, 21 years old, Heavy drinking cohort)</i>	
Tie Strength Scores	Alters
6	2401, 2402, 2403, 2417
5	2404, 2406, 2407, 2408, 2412
4	2405, 2409, 2410, 2411, 2413, 2415
3	2416
1	2414

26.

<i>Respondent: Ken (Male, 20 years old, Moderate drinking cohort)</i>	
Tie Strength Scores	Alters
6	2501
5	2504, 2512, 2513, 2514
4	2502, 2505, 2506
3	2503, 2508, 2510, 2515
2	2507, 2509, 2511, 2517
1	2516