



UNIVERSITY OF
LIVERPOOL

**That could have been the best night ever -
Developing knowledge on how regret
influences alcohol beliefs and behaviour**

Thesis submitted in accordance with the requirements of the University of Liverpool
for the degree of Doctor in Philosophy by Joel Crawford

February 2023

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Abstract

Young adults (18 to 30 years old) often report drinking to excess and as a result frequently experience regrettable health and social consequences. Nonetheless the relationship between experiencing regrettable consequences and future consequences is unclear, with past studies showing that experiencing regret does not consistently lead to reduced consumption. In addition, it is unknown if young adults experience regret from missing opportunities to drink socially, and if so, how this experience informs future consumption. This thesis had four aims: (1) to investigate why experiencing regret consequences fails to consistently impact future consumption; (2) to explore if regret is experienced from missing opportunities to drink socially and if so, (3) to investigate how this experience of regret impacts drinking intentions and alcohol consumption and (4) to test if this experience can be manipulated.

In Chapter one, theories of regret and health behaviour are discussed and applied to alcohol consumption. Chapter two outlines the methods used in the thesis. Chapter three reports the results of a qualitative study, the results of which suggest that regret fails to influence risk perceptions of alcohol and future drinking decisions, as post-consumption regrets are an expected part of a drinking episode, hence they do not readily influence future drinking plans or consumption. In addition chapter one also suggests that regret is experienced from missing opportunities to drink socially, labelled as the Fear of Missing Out (FoMO). Chapter four sought to explore experiences of FoMO within a further qualitative study. Results indicated FoMO is underpinned by the perception of missing out on social benefits, resulting in negative states such as worry and anxiety. Coping behaviours to manage these states are discussed. In Chapter five presents results of an ecological momentary assessment study that demonstrated FoMO is associated with intentions to drink and alcohol consumption in ecologically valid settings. Chapter six presents an experimental manipulation of FoMO; results suggest FoMO can be differentiated from other forms of regret and that it is most keenly felt when missing opportunities for social gains in alcohol contexts. Chapter 7 draws together findings from across the thesis and makes suggestions for future research in this area.

Overall, thesis findings highlight how and why regret fails to impact future decision-making with regard to alcohol consumption, presents novel findings on how FoMO is related to consumption and drinking intentions and shows that FoMO fluctuates over time and can be experimentally manipulated.

Dissemination

I submit this thesis in partial fulfilment of the condition for a PhD by published papers. The research chapters (three to six) take the form of journal article manuscripts in accordance with the guidelines for the University of Liverpool. These have either been published before submission (chapter three), or are prepared for publication (chapters four, five and six). As requested, specific details of each article submission (including contributions of authors) are presented at the beginning of each chapter.

Declaration

This thesis is entirely my own work. No portion of the thesis has been submitted either partially or otherwise in support of any other degree or qualification at this or any other institution.

Acknowledgements

Firstly and chiefly, I can't fully express my gratitude to Richard Cooke, who has been my supervisor for the last six years! It has been a long road from when I started my Masters until now. I can only thank you for seeing my potential and instilling a belief in me that I can achieve at the highest level. I have learnt so much from you and developed my abilities beyond what I ever thought was possible, from when I decided to undertake a psychology degree in my late twenties. Even after you left Liverpool for a much-deserved professorship, you continued as my supervisor when you had every right to move on – again I can only thank you for sticking by me and showing your commitment to my personal success. I've really enjoyed getting to know you over the years even if the majority of our chats have been online!

I'd also like to thank my secondary supervisors, Andy Jones, and Abi Rose for providing fresh insights into my work and for being there whenever I needed some additional expert advice.

To those I shared offices with, Lewis, Sarah, Carlee, Jasmine, and Tyler (sorry if I've left anyone out) it was great getting to know you all and sharing this wonderful experience! I really enjoyed all of our chats – they were a pleasant distraction from my typing.

Lastly but by no means least Hector and Madeleine.

Hector – although you can't read (I don't know any chihuahua's that can!), you have been my wee buddy throughout, your cheery disposition was a tonic at times when I felt stressed, and you were always willing to accompany me for a walk when I needed to clear my head. Good boy!

Madeleine – thank you for seeing my potential from day one! You have been a constant source of support and have never faltered in your belief in me to succeed. Even though English is your second language you provided a soundboard for my writing, so part of this work is yours too. I promise for the rest of our marriage you never have to discuss multi-level modelling with me again! Thank you for helping make all this possible – I dedicate this work to you!

Chapter One

General introduction

Alcohol use, prevalence, and consequences

Alcohol is a psychoactive substance that has been consumed across various cultures for many centuries. Across the world an estimated 2.3 billion people are current drinkers, consuming alcohol within the last 12 months, with more than half of the populations in the Americas, Europe and Western Pacific consuming alcohol weekly. On average current drinkers consume 32.8 grams of pure alcohol daily (World Health Organisation - WHO, 2018). Alcohol consumption is the third largest risk factor for mortality and disability, globally it accounts for 5.3% of all mortality and 5.1% of the global burden of disease and injury, measured in disability-adjusted life years (DALYs) (WHO, 2018).

In the UK, 57% of adults consume alcohol weekly and 24% exceed the government's low risk drinking guideline of 14 units per week (Public Health England, 2018). Further evidence suggests 16.6% of the adult UK population consume alcohol at a hazardous level (Adult Psychiatric Morbidity survey, 2014), as defined by the WHO's Alcohol Use Disorders Identification Test (AUDIT) (Saunders et al., 1993). Consuming alcohol in this fashion, especially in one or two sessions (i.e., heavy episodic drinking or binge drinking) is predictive of an increased risk of alcohol-related injury (Antai et al., 2014). Furthermore these consumption patterns are associated with experiencing other negative health consequences such as alcohol poisoning and blackouts (Rehm, 2011; Wetherill & Fromme, 2016).

Alcohol consumption has been identified as a causal factor in over 200 diseases, illnesses, injuries, and related health conditions (WHO, 2018). For example chronic use of alcohol is related to various non-communicable diseases, such as liver cirrhosis (Rocco et al., 2014), cardiovascular disease (Piano, 2017) and cancers, e.g. liver, colon, rectum, larynx and breast cancer (de Menezes et al., 2013). In addition to physiological health issues, chronic consumption has been linked to mental and behavioural disorders such as depression and alcohol dependence (Boden & Ferguson, 2011). People diagnosed with an alcohol use disorder (AUD) are 3.7 times more likely to have major depressive disorder (McHugh &

Weiss, 2019). Moreover alcohol consumption has been linked to increased risk of suicidal behaviour (Conner et al., 2014). Acute alcohol consumption is also linked to various health consequences, such as alcohol poisoning, alcohol induced amnesia and accidents/injuries (Rehm, 2011; Wetherill & Fromme, 2016). According to the WHO (2018), 40% of global alcohol-related disability adjusted life years, i.e. years lost due to ill health, are attributable to injuries, and in 2016, 900,000 deaths were due to alcohol-related injury.

The links between consumption and injury are well established, and evidence highlights a clear dose-response relationship (Rehm, 2011). Alcohol directly impacts the psychomotor system, with negative effects typically occurring when blood alcohol concentration (BAC) reaches .04 to .05%. Epidemiological findings suggest consuming this level of alcohol has a detrimental effect on psychomotor function (Brumback et al., 2007), other findings also indicate a lower BAC increases the risk of injury compared to zero consumption (Taylor et al., 2010). The injury risk posed from alcohol consumption is mediated by how often individuals' drink; those drinking less frequently are more likely to be involved in an accident at a certain BAC compared to regular drinkers. This is potentially due to decreased tolerance levels (Gmel, et al., 2010). Nonetheless the lifetime risk of injury from regular consumption of moderate amounts (i.e., up to 36 grams of pure alcohol: National Institute of Alcohol Abuse and Alcoholism (NIAAA), 2010) is considerable (Rehm, 2011).

Such research findings have been used to derive low-risk drinking guidelines. For example Rehm et al., (2009) demonstrated that consuming more than one standard drink per day (i.e. 14 grams of pure alcohol) is associated with increased net-risk of mortality and morbidity in Western nations. The NIAAA translated such findings into a low-risk drinking guideline of no more than 14 standard drinks per week for men and seven standard drink per week for women. Furthermore the NIAAA advises to reduce the occurrence of acute consequences, men should not drink more than four standard drinks per day and three for women (NIAAA, 2010). In the UK, epidemiological evidence of a dose-response relationship prompted the government to revise and update drinking guidelines in 2016. Specifically adults are advised not to exceed 14 units of alcohol (1 unit = 8 g of pure alcohol) per week, but also to spread their drinking evenly over three days or more (Chief Medical Officer, 2016).

Young adults and alcohol

Young adulthood (18 to 30 years old) is a time associated with change, in which individuals will experience stressors from various domains of life, for example decisions regarding their

living arrangements, higher education, embarking on a career path/employment, accessing licenced night life economies, initiation and experimentation with illicit drugs, and altered states of intoxication. Additionally they will often face issues with choices and meanings related to their sexuality and identity (Conroy & Measham, 2019). Although these pressures are not unique to young adults, the instability caused by the variety and novelty of these pressures suggest young adults alcohol use may be unique in terms of the wider context of the volatility and demands placed on them. Furthermore young adults face pressures to conform or resist cultural perspectives of what 'being' a young adult should or should not entail. For example over the last few decades alcohol has become intertwined with notions of being young, empirical evidence suggests alcohol is perceived as social imperative for many young adults (de Visser et al., 2013; Dresler & Anderson, 2017; Lyons et al., 2018).

Perceptions such as these are potentially driven by various influences, such as marketing forces, which have capitalised on this symbolic power in specific settings such as hospitality and leisure (Hastings et al., 2010; Rowley & Williams, 2008), further exacerbated by the rise of social media in recent years, in which young adults are exposed to more alcohol-related events, advertisements and influencers (Hendriks et al., 2020). When adolescents transition into young adults, they are now able to experience first-hand the role alcohol plays in their lives, beyond the experimental stage (Davies et al., 2018). For example many young adults will decide to leave the protective influence of the familial home and local community for work, travel, university or to live with a partner or friends. During these times they may begin to form and solidify particular understandings about the role alcohol plays in their lives, e.g. the use of alcohol in forming and strengthening social bonds/identities (de Visser, et al., 2013; Dresler & Anderson, 2017; Lyons et al., 2018). The notions formed during this stage of life can have a profound impact on how alcohol is viewed and used (or not used) for later life (Conroy & Measham, 2019). Therefore it is of vital importance to study and develop understandings of what drives alcohol consumption during this stage of life.

Expectancy-value theories of health

A range of psychological constructs have been shown to drive alcohol consumption, typically framed within the context of theories that seek to explain why individuals engage with health behaviours, such as expectancy-value theories of health, that assess human social behaviour (e.g. Health Belief Model, Rosenstock, 1974; Theory of Planned Behaviour, Ajzen, 1991; Prototype Willingness Model, Gibbons & Gerrard, 1995). Expectancy-value models of health

suggest engagement with a health behaviour is determined by a subjective cost-benefit analysis, in which we consider and evaluate the pros and cons of the given behaviour (van der Pligt & de Vries, 1998).

Expectancy-value models such as the Health Belief Model (HBM; Rosenstock, 1974) and Protection Motivation Theory (PMT; Maddux & Rodgers, 1983) suggest heightening perceptions of risk through an increased sense of threat and sense of vulnerability to harm promotes behaviour change. If we are confronted with the dangers of consuming alcohol, for example from an alcohol warning label then our perception of threat and our vulnerability to experiencing the harms should increase. This in turn will heighten perception of risk and engender change, i.e., moderation of drinking (Maddux & Rodgers, 1983; Rosenstock, 1974). Therefore the HBM/PMT suggests drinking decisions are driven by a cost-benefit analysis of perceived threats (i.e., cons) and the appeal to avoid negative consequences (i.e., pros). Meta-analytic evidence highlights risk perceptions have a small but significant association between behavioural intentions (i.e., our intent towards behavioural performance) and health behaviour (Brewer et al., 2007; Floyd et al., 2000). In relation to alcohol the evidence is less clear, constructs of perceived threat and vulnerability have been associated with alcohol consumption (Minugh et al., 1998; Von Ah et al., 2004), however a meta-analysis from Sheeran et al. (2014) highlights that heightening risk appraisals including perceived threat had no significant effect on changing intentions to consume alcohol or consumption behaviour. Nonetheless the analysis included a limited number of studies assessing alcohol consumption ($k = 8$), hence further tests may be warranted to ascertain whether heightening risk appraisals outlined in the HBM and PMT influence drinking behaviours.

Although the evidence for the HBM and PMT regarding drinking behaviours is limited, additional expectancy-value theories that incorporate other psychological constructs have been shown to have predictive validity for drinking behaviours. The Theory of Planned Behaviour (TPB; Ajzen, 1991), is one such theory which suggests that our decision to engage with a behaviour such as alcohol consumption is predicted by our intention to engage with the behaviour. The TPB proposes that intentions are underpinned by three constructs: (1) attitudes, our positive or negative evaluations of the behaviour, (2) subjective norms, our perceptions of others' approval/disapproval of the behaviour, and (3) perceived behavioural control (PBC), our perceptions of control over behavioural performance. PBC reflects both internal and external control factors such self-efficacy (i.e., confidence that we can perform a behaviour) and perceived control (i.e., how much control we have over behavioural

performance) (Ajzen, 1991). Ajzen (1991) suggests PBC is also a direct predictor of behaviour, in that perceived control reflects actual control over behaviour. According to the TPB the decision to consume alcohol is informed by a cognitive appraisal process in which we assess the pros and cons of consumption, based on how we perceive it will make us feel, our belief about what others think of our drinking, and if we feel we have agency in performing the behaviour, hence we are seen as a rational actor when deciding to drink.

A meta-analysis by Cooke et al. (2016) assessed the efficacy of the TPB for predicting consumption. They report a large size relationship between attitudes and intentions ($r_+ = .62$), a medium size relationship between subjective norms and intentions ($r_+ = .47$) and a large size relationship between intention and consumption ($r_+ = .54$). This suggests that attitudes and subjective norms may inform drinking intentions as outlined in the TPB but also that intentions predict drinking behaviour. However the results for PBC predicting drinking intentions are less clear, although Cooke et al. (2016) report a medium size relationship ($r_+ = .31$) they also highlight that many studies reported negative relationships between PBC and intentions, meaning higher intentions to drink were associated with lower PBC. This dichotomy of results was not present in either the attitude-intention or subjective norm-intention relationships, but it also contradicts the tenets of the model. Furthermore Cooke et al. (2016) report that PBC failed to predict consumption behaviour, with the results highlighting a null and negative relationship ($r_+ = -.05$). The conflicting results for PBC can be resultant of individuals overestimating how much control they actually have (Cooke et al., 2016).

The evidence suggests that intentions may be the principal driver of alcohol consumption, however individuals often fail to act on their intentions. For example Sheeran (2002) reports that intentions account for 28% of the variance in a range of behaviours (including alcohol consumption), although this is a sizeable contribution in explaining behavioural performance it suggests a large proportion of variance is left unexplained. The issue of the intention-behaviour gap (Webb & Sheeran, 2006) may be problematic for explaining what drives alcohol consumption, as engagement with drinking can often be the result of reactions to environmental or situational stimuli, in addition to goal-directed or planned behaviour (Thaler & Sunstein, 2009). Therefore dual process models have been proposed to account for a reactive or automatic pathway for behaviour along with the reasoned and planned pathway.

One such model that accounts for the dual pathways to behaviour is the Prototype Willingness model (PWM; Gibbons & Gerrard, 1995). As with existing expectancy-value models, the PWM suggests engagement with health behaviour is driven by planned behaviour in which our attitudes and subjective norms inform our intentions and subsequent behaviour, i.e., the subjective cost-benefit analysis of behavioural outcomes. However the PWM aims to extend the notion of planned behaviour by accounting for the unsolicited engagement in health-risk behaviour when faced with a risk-conducive situation (Gibbons & Gerrard, 1995). This is especially apparent in young adults who may find themselves in these situations with alcohol, for example when they first attend university (Davies et al., 2018).

The PWM is composed of two constructs, prototypes and willingness. Prototypes are a schema of the typical person who we associate with a behaviour, for example young people report having a clear idea about the typical person within their age group who engages in risk-taking, often described as popular, care-free, and confident (Gerrard et al., 2006). The PWM suggests these powerful images of a prototype influence behaviour through social comparison, if we evaluate the image as favourable (prototype favourability) and if we judge the prototype as similar to ourselves (prototype similarity), then we are more likely to engage with the behaviour (Gibbons & Gerrard, 1995). Conversely if we evaluate the image as negative and not consistent with our self-image then we are less likely to engage with the behaviour. The consideration of the value and similarity of the prototype may be important for young adults, who are in a life stage associated with change, wherein they face choices over their identity and self-image (Conroy & Measham, 2019). Subscribing to a certain prototype and adopting their characteristics, may help solidify choices for embracing a certain self-image or identity (Gerrard et al., 2006). The model suggests that when presented with a risk-conducive situation, the prototype images influence our actions by informing willingness to engage in the behaviour, i.e., our openness to risk opportunity (Gibbons & Gerrard, 1995). Gibbons et al. (1998) suggest that willingness differs from intentions as an individual may not intend to engage with a behaviour but may do so if the opportunity arises; intentions require careful consideration of the behavioural outcomes, whereas willingness operates with little or no consideration of the outcomes. Hence willingness represents the reactive or automatic pathway to behaviour.

A meta-analysis from Todd et al. (2016) assessed if the PWM predicts health behaviour, reporting that the PWM constructs accounted for 20.5% of the variance in behaviour. This provides support for the notion of a reactive pathway for behavioural performance (Gibbons

& Gerrard, 1995). Regarding alcohol specifically, Todd et al. (2016) found this behaviour was best predicted by the PWM out of all the health behaviours included in their analysis, with 42.5% of the variance in drinking behaviour explained by the PWM constructs. A medium-sized relationship was reported for prototype and willingness ($r = .406$), along with prototype and drinking behaviour ($r = .376$), whilst there was a large-size relationship between willingness and behaviour ($r = .535$). These findings suggest the PWM has good predictive validity for alcohol consumption.

Todd et al. (2016) also assessed the comparison between the reasoned pathway of behaviour (attitudes, subjective norms, intentions) with the reactive pathway (PWM constructs of prototypes and willingness), reporting that when controlling for the impact of intention on behaviour, willingness only explained an additional 1.4% of the variance in alcohol consumption behaviour. This finding suggests that models focusing on the reasoned pathway to behaviour have equal validity in predicting alcohol consumption. Ajzen (1991) suggests that intentions and willingness are both underpinned by behavioural expectation (i.e., subjective probability that a behaviour will be performed), hence neither construct may make a unique contribution to the prediction of behaviour in the same model. This suggestion is consistent with Todd et al. (2016) who reported that intentions and willingness are highly correlated ($r = .749$) for alcohol consumption. Furthermore Davies et al. (2017) report that willingness better predicted alcohol consumption for adolescents (aged 11 to 17), whereas intentions better predicted adult consumption (aged 18+), therefore planned behaviour may better explain adult drinking behaviour.

In framing psychological drivers in the context of health behaviour theories, it has identified that how an individual interacts with alcohol, along with how they react to environmental cues influences and informs their alcohol-related cognitions and subsequent behaviour. Therefore psychological constructs are assumed to exert their influence on consumption by informing a weighing of the pros (e.g. lowering of inhibitions) and cons (e.g. health risks) of drinking behaviour, whilst also influencing how we react to environmental cues, for example if we find certain prototypes are favourable and similar to our self-image.

Nonetheless it is less clear if individuals actually employ this reasoning or react this way when deciding to drink. For example young adult men display ambivalence towards the negative outcomes of drinking (e.g. hangovers, vomiting), reflecting that they are the price of a good time (i.e. the positive outcomes such as social bonding) (de Visser & Smith, 2007).

Furthermore, Cooper et al., (2015) report that the positive motives for drinking (e.g. increased confidence, relaxation) are more readily endorsed than the negative motives (e.g. reducing negative affect). This questions whether individuals consider the cons or weigh them against the pros when faced with the decision to drink. Additionally evidence suggests young adults often focus on maximising the benefits of consumption by reaching an optimal state of intoxication, i.e. they reach the ‘sweet spot’ (Graber et al., 2016) or get ‘a buzz’ (Beccaria et al., 2015). Hence, they may be motivated to achieve benefits by reaching a subjective level of intoxication based on their past experiences of how they react to alcohol. This suggests that other motivational factors not outlined in expectancy-value models may help explain young adults’ drinking decisions.

Motivational drivers of alcohol

Once such model that focuses on the motivational determinants of alcohol consumption is the Incentive Motivation Model (Cox & Klinger, 1988), which suggests we are motivated to seek positive incentives and avoid negative ones. When applying this to alcohol, motivations to drink are linked to the incentives from drinking behaviour, how this interacts with other domains in life, and the change in affect resulting from the motivation. The affective change alluded to in the model refers to the change in affect we could experience from pursuing the positive incentives and avoiding the negative ones. Hence the model primarily focuses on the motivational effects of alcohol with an emphasis on weighing the affective outcomes of drinking against the affective outcomes of not drinking alcohol and positions the individual as the main protagonist of their drinking behaviour (Cox & Klinger, 1988).

The model suggests motivation to engage with alcohol consumption is underpinned by two tenets, firstly we are motivated to seek outcomes from drinking for internal reasons (e.g. I drink because I want to) and external reasons (e.g. drinking in response to others). Secondly if we perceive drinking can achieve an approach positive goal (e.g. feeling more confident) or an avoid negative goal (e.g. stress relief) then drinking is likely to follow as the incentive to drink outweighs the incentive not to drink. Alternatively we may perceive that drinking leads to an approach negative goal (e.g. vomiting) or an avoid positive goal (e.g. saying or doing something embarrassing), then the incentive to avoid alcohol outweighs the incentive to drink (Cox & Klinger, 1988).

Cooper (1994) merged the two tenets of the incentive motivation model to create four drinking motives; conformity (reflecting external and negative motivations), coping

(reflecting internal and negative motivations), enhancement (reflecting internal and positive motivations) and social (reflecting external and positive motivations). Cooper (1994) developed the Drinking Motives Questionnaire-Revised to assess these motives, which has been used in the literature to predict consumption but also identify which motives are prevalent (Bollen et al., 2021; Cooper et al., 2015; Kuntsche et al., 2005).

A review by Kuntsche et al. (2005) highlights that young adults most commonly report social motives for drinking, and that social motives are associated with moderate drinking. Further to this a review by Cooper et al., (2015) found that social motives had a medium-size relationship with consumption. Bollen et al. (2021) were able to demonstrate that social motives were more frequently reported by young adults pre-COVID-19 lockdown, however during the lockdown, i.e., when opportunities to drink in social settings were limited or not available, social motives predicted lower consumption. Therefore young adults may drink to achieve outcomes that have a positive benefit for the individual but also for others around them; for example drinking to increase confidence, to have fun and lowering of inhibitions in social settings (de Visser, 2021). Considering this, alcohol consumption can be viewed as an inherently social behaviour, performed to achieve social gains such as bonding and creating group identities (de Visser et al., 2013; Griffin et al., 2018). Due to the pro-social effects of alcohol, young adults perceive that drinking in a social setting affords a greater opportunity to bond with peers than other social activities, and they consider drinking as a social imperative (de Visser et al., 2013; Dresler & Anderson, 2017; Frank et al., 2020). This suggests that social motives for consuming alcohol may play a large role when young adults decide to drink.

Using the precepts regarding incentive motivation we can place social factors into this context, for example an individual may be motivated to pursue the social benefits of alcohol consumption, as they enable them to garner positive affect from the feeling of social inclusion, attained from bonding and creating group identities with peers (Dresler & Anderson, 2017; Griffin et al., 2018). Furthermore by engaging in drinking they are limiting or minimising potential for negative affect from feelings of social exclusion/isolation by missing out on the opportunity to bond and create social identities via social drinking (Conroy & de Visser, 2013; Frank et al., 2020). This can potentially explain how social factors exert their influence on drinking decisions, i.e. young adults are motivated to garner positive affect from feelings of inclusion whilst minimising negative affect from the feeling of social exclusion. In the pursuit of social benefits young adults engage with unique drinking

patterns, although this group is less likely to drink, when they do consume alcohol, it tends to be heavier than any other age group (ONS, 2018). Evidence suggests that nearly one fifth of all mortality in 16- 24-year-olds is directly attributed to alcohol (Jones & Bellis, 2013), and 50% of alcohol-related death in 20 - 24-year-olds is from alcohol poisoning, higher than any other age group (ONS, 2018). Furthermore evidence highlights that two-thirds of university students in Ireland and the UK (typically aged 18 to 24) consume alcohol at a hazardous rate and 20% consume alcohol at rate that indicates possible dependence on the AUDIT (Davoren et al., 2016). Interestingly when young adults are asked to gauge their drinker typology, 42% class themselves as social drinkers, denoted by less frequent, moderate drinking at social events, whilst only 16% class themselves as heavy drinkers (Davoren et al., 2016). The disparity between actual consumption and perceptions of consumption patterns could be due to social desirability or impression management bias, wherein individuals underestimate their consumption (Davis et al., 2010), but also a lack of knowledge of the low-risk drinking guidelines: de Visser and Birch (2011) demonstrated nearly two thirds underestimated the alcohol unit content of poured drinks, whilst less than half had correct knowledge of the low-risk drinking guidelines. Furthermore a culture of drinking may exist for young adults in the UK, wherein alcohol consumption is an expected part of social functions and seen as a normalised practice (Davies et al., 2018; de Visser et al., 2013; de Visser & Smith, 2007). This potentially explains why young adults may inadvertently drink to excess and may be a reason why they are prone to experience the consequences of acute alcohol consumption (Jones et al., 2020; Rehm, 2009; Wetherill & Fromme; 2016).

When young adults drink to excess they often report reaching a 'tipping point' wherein they exceed their subjective tolerance level and experience a subsequent loss of control (Davies et al., 2020). This lack of control may be due to alcohol impacting the psychomotor system (Taylor et al., 2010). Alternatively, the loss of control could be due to alcohol impairing executive cognitive function, whereby preservative error is exacerbated, and planning is diminished (George et al., 2005). This suggests that the loss of control experienced from excess consumption can occur both cognitively and/or physiologically. During this diminished, inebriated state wherein judgement is impaired, young adults often report engaging with a set of behaviours that are deemed regrettable; for example embarrassing oneself, vomiting, risky sexual practice, illicit drug use (Davies & Joshi, 2018; Dunne & Katz, 2015; Jones et al., 2020).

Regret

Regret is one of the most common emotions experienced in day-to-day life. We often reflect on the outcomes from our past deeds and wish we had acted differently. The self-focused thoughts of ‘what could have been’ drive the emotion regret (Gilovich & Medvec, 1994). Emotions are characterised by a generalised experience of feeling good or bad, paired with a cognitive attribution about what caused the affective state (Barrett, 2006), suggesting emotions are a combination of affect and cognition. In this sense regret incorporates both negative affect and counterfactual thinking (i.e., contemplating on what might have been) (Gilovich & Medvec, 1994). When comparing our current situation with a more favourable outcome, we engage with upward counterfactual thinking (i.e., thinking about alternative courses of action to improve outcomes). This pattern of thought encompasses self-blame and by attaching agency to the undesirable outcome, negative affect is experienced, and regret occurs (Gilovich & Medvec, 1994, 1995).

Regret can be experienced from our actions (i.e., action regret) or from our inactions (i.e., inaction regret; Gilovich & Medvec, 1994). Furthermore we can anticipate experiencing regret in the future from potential actions and resultant outcomes (Richard, van der Pligt & de Vries, 1995). Anticipated regret (AR) primarily is a cognition, however the experience of anticipating a future negative outcome has been shown to elicit affect in the present (Coricelli et al., 2007). Regret is variable, with some instances feeling much more intense than others (Gilovich et al., 1998). Over the last few decades, researchers have produced theories to predict what drives the intensity of regret, each with a unique view.

Regret theories

The temporal theory of regret (Gilovich & Medvec, 1994, 1995) suggest regret intensity is driven by the *nature* of the regrettable decision, i.e., due to our action or inaction. Regret following inaction (i.e., failing to act) is deemed as more intense with the passage of time whereas regret following action (i.e., acting) lessens with time. Gilovich and Medvec (1994, 1995) suggest the temporal disparity in regret intensity between inaction and action regrets, is a consequence of the fact that it is easier to deal with something you did, for example apologising to a friend for embarrassing drunken behaviour, than to deal with something you did not do, for example missing a friend’s birthday party.

A further theory of regret is decision-justification theory (Connolly & Zeelenberg, 2002), which suggests regret is driven by the underlying *belief* about the consequences from making

a particular decision. The theory proposes a key aspect of experiencing regret is the outcome of the decision: regret is more intense if the outcome from our decision results in a worse set of circumstances, than the outcomes of alternative choices, for example, a hangover would have been less severe if we had stopped drinking when feeling tipsy. Furthermore, the theory suggests how keenly we experience regret is dependent on how justifiable we deem our actions, a decision resulting in a poor outcome, will cause less regret if we justify making the decision; a drunken altercation can be justified if we perceive we have been provoked, and hence less regret would be experienced.

An alternative theory is the belonging theory of regret (Morrison et al., 2012), which suggests the *context* of the regrettable decision drives regret intensity. Morrison et al. (2012) highlight that regret is most intense in domains related to our sense of social belonging (e.g., friendships, family), compared to less social contexts (e.g., work, education). Therefore we are more likely to experience regret when a poor decision places a direct threat to our sense of belonging, for example a drunken argument that causes a falling out with a friend, compared to missing a lecture due to a hangover. In sum, each of these regret theories suggest how the nature, reasoning, and the context of decision-making impact regret intensity. Evidence suggests that when regrets are more keenly felt they have bigger impact on decision making and behaviour (Zeelenberg & Pieters, 2007).

Regret and behaviour

“Fully experiencing regrets may be the miracle ingredient to transforming them” – Landman (1993).

As the Landman (1993) quote suggests, the experience of regret affords us an opportunity to learn from our mistakes, whereby we can identify and enact behaviours that enable us to avoid repeating the same mistake again (Epstude & Roese, 2008). Nonetheless regret can have paradoxical effects on decision-making and subsequent behaviour. In one instance excessive rumination on past regrettable experiences and/or the possibility of experiencing regret in the future can result in sub-optimal decision making (Ratner & Herbst, 2005; Reb & Connolly, 2009). For example we can become averse to risk and miss opportunities for gains (Kahneman & Tversky, 2013). On the other hand the experience of regret can be beneficial for decision making, by informing careful and thorough decisions, which often translate into behavioural intentions (a well-known precursor to behaviour: Ajzen, 1991) (Reb & Connolly 2009). Regret is typically experienced when we attach agency to negative or undesirable

outcomes, hence individuals will act to ameliorate experiences of regret and to lessen the potential of self-blame from poor decision making in the future (Zeelenberg & Pieters, 2007). Empirical evidence highlights individuals who experience regret are more likely to identify and act on poor decisions from their past (Zeelenberg & Pieters, 1999).

In the health domain, research into the impact of regret on health behaviour has largely focused on AR (Brewer et al., 2016; Ravis, Sheeran & Armitage, 2009; Sandberg & Connor, 2008). This is due to the nature of contemplating future outcomes, in which we engage in a subjective cost-benefit analysis, in which we assess the likelihood of experiencing adverse health outcomes from our actions (van der Pligt & de Vries, 1998). Two meta-analyses have assessed the relationship between AR and health behaviour. First, Sandberg and Conner (2008) assessed extending the TPB with AR for the prediction of behaviour. They report medium-sized relationships between AR and behavioural intention ($r_+ = .47$, $k = 25$, $N = 11\,254$) and between AR and behaviour ($r_+ = .32$, $k = 8$, $N = 2035$). Although the eight independent studies found a significant association between AR and behaviour, Sandberg and Conner (2008) suggest potential moderation effects were evident, i.e., the homogeneity statistic showed variation in the reported correlations. This suggests AR's relationship with behaviour is inconsistent. Second, Brewer et al., (2016) assessed the relationships between AR, intention and behaviour, as well as evaluating the different types of regret i.e., anticipated action regret and anticipated inaction regret. Overall, AR was associated with intentions ($r_+ = .50$, $k = 80$) and behaviour ($r_+ = .29$, $k = 48$). Anticipated action regret was proposed to discourage behavioural performance, e.g., AR of alcohol consumption (if it caused liver disease) discourages drinking whereas anticipated inaction regret was proposed to encourage behavioural performance, e.g., AR of not consuming alcohol (if it caused social alienation) encourages drinking. Support for these proposals was found in results: Anticipated action regret was negatively associated with intention ($r_+ = -.45$, $k = 28$) and behaviour ($r_+ = -.28$, $k = 19$), while anticipated inaction regret was positively associated with intention ($r_+ = .52$, $k = 52$) and behaviour ($r_+ = .29$, $k = 29$). The findings suggest inaction regret may have a larger impact on behavioural intentions than action regret, however there is little difference between the two forms of regret in their associations with health behaviour.

Regret and Alcohol

In assessing how regret may influence alcohol perceptions and behaviours, we can consider how the construct impacts appraisal of risk when faced with the decision to consume alcohol.

According to expectancy-value models of health behaviour our decision to engage with a health behaviour such as alcohol consumption is based on an appraisal of risk for experiencing adverse outcomes (van der Pligt & de Vries, 1998), for example hangovers, accidents and injuries, unsafe sex (Davies & Joshi, 2018). When faced with the decision to consume alcohol we engage with cognitive appraisal processes that focus on expectations of experiencing an outcome through an action or behaviour (e.g. perceived likelihood) and an evaluation of perceived consequences (e.g. perceived severity) (van der Pligt & de Vries, 1998). Evidence suggests that for health behaviours heightening risk appraisals has a small, but significant, impact on both intentions, $d+ = .31$ ($k = 217$), and behaviour $d+ = .23$ ($k = 93$) (Sheeran et al., 2014). Furthermore the impact of risk appraisals on intentions and behaviour is heightened when combining perceptions of threat with affective reactions such as AR. This has led to the suggestion that AR is a novel risk appraisal (Sheeran et al., 2014). Applied to alcohol consumption, anticipating the regret from potential negative states caused by our drinking behaviour (e.g. hangovers, vomiting) heightens the perceived severity of the consequences, along with the perceived fear of them and increasing our susceptibility of experiencing them post-consumption. This evaluation should prompt the formation of negative intentions to consume alcohol.

Nonetheless in the alcohol literature, mixed results for the association of regret and consumption have been reported. Stoddard et al. (2012) demonstrated a negative relationship between AR and previous 30-day alcohol use ($r = -.27$). There are also several studies using prospective designs that show an association between regret and drinking intentions: Cooke et al. (2007) demonstrated a large-sized relationship between AR and intentions to limit drinking ($r = .67$), Barratt and Cooke (2018) highlighted a moderate relationship for females ($\beta = .30$), whilst Azjen and Sheikh (2013) assessed the relationship between anticipated affect and intentions (including AR); they report a medium size relationship with intentions ($r = .45$). Although significant relationships between AR and drinking intentions are reported, results for consumption suggest AR has limited validity in prospectively predicting future consumption - Barratt and Cooke (2018) and Cooke et al. (2007) both reported non-significant relationships between AR and behaviour, whilst Azjen and Sheikh did not measure drinking behaviour. The disparity between AR's ability to predict intentions and behaviour may be a result of the design of such studies, i.e. assessing relationships using single measurements, and a weeklong gap between measures of AR and behaviour, mean that fluctuations in regret are not captured. For example the impact of regret on future behaviour

may be more pronounced depending on the frequency and intensity of the regret, and without measuring this, the magnitude of regret for predicting behaviour may not have been fully assessed.

A key issue with the studies assessing the relationship between AR and alcohol is that they do not consider the broader context of what is actually regretted when drinking to excess; Dunne and Katz (2015) report that young adults experience regret from inebriated social behaviours, such as saying something embarrassing, acting out of character or drunk-dialling/texting. They highlight a prevalence rate of 66.1% of these regrettable behaviours but also that alcohol consumption is positively associated with engagement in the behaviours. Young adults often report experiencing regret from engaging in drunken sexual behaviour, for example Orchowski et al. (2012) highlight that 25% regretted engaging in a sexual act when inebriated, whilst Oswald et al. (2005) report that sexual behaviour is often deemed as regrettable due to the effects of alcohol on decision-making. Peterson et al. (2020) report around one third of regretted sex in college students is directly attributable to alcohol consumption.

Davies and Joshi (2018) further investigated what consequences of excess drinking are regretted, resulting in a typology of alcohol-regrets. They report three types of regrets: (1) common regrets, such as vomiting, hangovers, memory loss, wasting time and/or money (2) risky-behaviour regrets such as sexual encounters, illicit drug use, smoking, and (3) serious regrets, including physical/verbal aggression, injuries, drink-driving, pregnancy. Davies and Joshi (2018) report which of the regrets are deemed as the most intense, for common regrets it was wasting time, risky behaviour it was smoking and for serious regrets, unintended pregnancy was judged as most regrettable.

Jones et al. (2020) expanded on the findings of Davies and Joshi (2018) by assessing the regrettable experiences in an ecological valid setting. Using ecological momentary assessment (EMA), Jones et al. (2020) were able to assess the frequency of these regrets, to investigate if consumption predicts these experiences but also if regrettable experiences predict intentions – hence enabling a thorough examination of the relationship between actual regretted experiences and alcohol. Over a two-week period they reported that a hangover was the most frequently experienced common regret, with 79% of the sample regretting a hangover. For risk-behaviour regrets, the most common reported was smoking, with 36% reporting regretting this experience and finally for serious regrets, 37% reported regret over

missing work due to alcohol. These results suggest that the prevalence of alcohol-related regrets is relatively high – supporting previous studies showing similar prevalence of regretted behaviour (Dunne & Katz, 2015; Orchowksi et al., 2012; Peterson et al., 2020)

Jones et al. report that past alcohol consumption (measured in UK units) was a positive predictor of all regrets, serious regrets, and risk-behaviour regrets. However no association was found between consumption and common regrets. For drinking intentions, none of the regret types predicted future drinking intentions, contrasting with results from previous studies that used a single measure of regret (Azjen & Sheikh, 2013; Barratt & Cooke, 2018; Cooke et al., 2007). The results suggest that regret is a common experience following consumption, but also that increased consumption is predictive of increased regrettable experiences. However, experiencing regret was not linked to future plans to drink, suggesting limited predictive validity for future consumption. Furthermore, an EMA study by Epler et al. (2014) found that the experience of a hangover (one of the most frequently reported regrets) delayed future consumption by only six hours, further highlighting how regrettable experience fails to inform future drinking.

The results from Jones et al. (2020) and Epler et al. (2014) suggest the experience of regret post drinking, fails to inform risk appraisals for engaging with future consumption. Nonetheless the prevalence of these behaviours is high and engaging with them places young adults at an increased risk of alcohol-related harm. For example, Jones et al. (2020) report that just under 50% of their sample reported experiencing a blackout (i.e., alcohol induced amnesia). Blackouts are associated with increased mortality and morbidity, along with other negative consequences (see Wetherill & Fromme, 2016 for a review). According to expectancy-value models of health behaviour, such negative experiences should inform risk appraisals for future consumption (van der Pligt & de Vries, 1998). However a factor that may be overlooked by such models is that they fail to account for the social motives and perceived social benefits of engaging with alcohol consumption. It may be the case that such motives are more pertinent than potential consequences in informing drinking decisions, as there may be a greater immediacy for experiencing these benefits compared to the more distal negative consequences, that tend to occur post-consumption. Nonetheless this suggestion has yet to be explored in the literature, hence the aim of the first study in this thesis is to explore why regrettable experiences following excess consumption fails to inform risk appraisals and plans for future drinking.

The first study in this thesis explored a gap in the current alcohol-regret literature. To date, studies have rarely considered if regret is experienced from missing opportunities to drink alcohol, i.e., inaction regret. The Brewer et al. (2016) meta-analysis suggests inaction regret has a stronger association with intentions compared to action regret, supporting notions of what drives regret intensity as outlined by the temporal theory of regret, i.e., over time more regret is experienced from inaction, as we are unable to act to rectify our poor decision-making (Gilovich & Medvec, 1994, 1995). There is a lack of research into the effects of inaction regret on alcohol consumption. Only one study has explored if inaction regret is associated with intentions to drink alcohol in young adults; Azjen and Sheikh (2013) highlighted that anticipated affect (including an item for anticipated inaction regret) had an effect on intentions to drink alcohol ($\beta = -.29$). However, as the regret item was incorporated into a measure of anticipated affect, we cannot be certain of the unique effect of inaction regret on drinking intentions. In addition, Azjen and Sheikh's sample size was small ($N = 49$) and importantly they failed to assess the relationship with consumption. Therefore, the relationship between inaction regret and consumption is unclear. Furthermore, the literature has yet to explore what is regretted when missing opportunities to drink alcohol; however young adults often report a sense of missing out, when they are unable to attend social events, colloquially known as Fear of Missing Out (FoMO) (Przybylski et al., 2013). Currently it is unknown if young adults experience this form of regret from missing alcohol-related social events, the thesis will seek to explore this suggestion.

Fear of Missing Out (FoMO)

With the rise of social media over the last two decades we now have an abundance of social information, enabling us to easily access real-time information about our peers' social lives and activities. The profusion of 'updates' from our ever-widening social circles has led to a (relatively) new phenomenon called *Fear of Missing Out*, informally known as FoMO, typically experienced when we imagine others are having a rewarding experience from which we are absent and is typified by a desire to stay up to date with others' activities (Przybylski et al., 2013). Przybylski et al. (2013) suggest FoMO is underpinned by perceived threats to the basic human needs outlined in self-determination theory; competence (ability to act in our environment), autonomy (the feeling of having personal initiative), and relatedness (feeling close with others) (Deci & Ryan, 1985). Nonetheless, we can consider FoMO to be an affective and cognitive experience, in which we experience negative affect, as a result of a perceived discord between our current and possible experience based on comparisons with

our immediate and wider social environment. In this sense FoMO can be said to have affective and cognitive components (Browne et al., 2018). The affective component typifies the emotions experienced during FoMO, namely regret, anxiety, fear, worry and envy (Przybylski et al., 2013). The cognitive component describes the process of FoMO, namely we engage in social comparison, wherein we compare our circumstances to our social environment and counterfactual thinking, whereby we compare our current state to alternatives, that are deemed superior (Przybylski et al., 2013).

FoMO and Regret

Although the construct labelling indicates ‘fear’ is the driving affective component of FoMO, evidence indicates that anxiety and apprehension are the overriding emotions (Przybylski et al., 2013). Nonetheless the emotions may combine in a sequence that ultimately ends in regret and envy. For example, we may initially experience fear of social exclusion if we decide to stay home in lieu of attending an event with friends, however, this may lead to an apprehension or a lingering anxiety that our friends are having a great time and garnering inclusionary status without us; consequently leading us to experience worry about our standing within our social group (Lai et al., 2016). Therefore, FoMO is a reactionary state based on uncertainty about potential negative future outcomes, hence in this sense FoMO is very similar to regret/AR, i.e., we may worry about the choices we have made, are currently making or future choices, that will result in suboptimal outcomes, which we will come to regret or anticipate regretting in the future. However with FoMO there is an accompanying residual feeling that the missed choice will be more enjoyable than our chosen activity (Milyavskaya, et al., 2018), suggesting we may experience a sense of envy in addition to regret.

In considering the cognitive components of FoMO we can draw a parallel with regret. When experiencing FoMO we engage with a similar if not identical counterfactual thinking process, that drives the experience of regret, i.e., dwelling on thoughts of ‘what could have been’ (Zeelenberg & Pieters, 2007). For example we may choose to stay at home to revise for an exam instead of going out with friends to a social function. In doing so we may construct a counterfactual thought of ‘what could have been’ contrasting it with our reality. The counterfactual thought could be ‘I would have had a so much fun with my friends’, in which we generate a mental simulation of the alternative reality in which we went out with our friends and had fun. This counterfactual thought may lead us to regret missing out. The

feeling of envy may be attributed to the social comparisons we engage with when experiencing FoMO, i.e., we compare our current experiences with peers having alternative experiences. Evidence suggests individuals tend to have a negative bias when comparing their circumstances against others, surmising their lives and experiences are inferior, this is most apparent for social activities (Milyavskaya et al., 2018). Considering both these points, it has been suggested that FoMO is a social construct that is a specific form of regret, rumination and envy based on reactions to social information (Reagle, 2015).

FoMO and Behaviour

Przybylski et al. (2013) conducted the first large-scale study regarding FoMO, resulting in a reliable 10-item scale that assessed the individual difference variable. The scale includes items that assess affect and rumination such as *'I fear others have more rewarding experiences than me'* and *'Sometimes I wonder if I spend too much time keeping up with what's going on'*. In addition the scale also includes items assessing the desire to stay up to date with others' activities, for example *'When I go on vacation, I continue to keep tabs on what my friends are doing'*. Using the scale Przybylski et al. (2013) were able to demonstrate that FoMO was linked to lower life satisfaction, low mood, and higher social media use.

Further research highlights the links between FoMO and problematic social media and smartphone use; individuals high in FoMO spend more time using social media such as Facebook or Instagram and feel a greater need to check and use their smartphone (Beyens et al., 2016; Elhai et al., 2016). Furthermore, evidence indicates a possible relationship between FoMO, social media/smartphone use and mental health/wellbeing; FoMO experienced as a result of exposure to social information from social media has been associated with increased depressive symptoms, decreased life satisfaction, mood and wellbeing (Fioravanti et al., 2021). In addition, FoMO has been linked to increased stress, fatigue and poor sleeping patterns (Milyavskaya et al., 2018); whilst links between FoMO and other behaviours have been established, such as consumer purchasing (Kang et al., 2019), marketing and advertising (Hodkinson et al., 2019) - however within the literature there is a lack of research into social activities 'away-from-the-keyboard' or 'in real life', such as attending alcohol related events such as parties with friends or going out clubbing.

In considering how inaction regret in the form of FoMO may influence drinking decisions we can contrast with how action regret impacts risk appraisals outlined in the expectancy-value models of health. As previously noted, the potential for action regret over negative outcomes

may heighten risk appraisals, in turn leading to the formation of negative intentions to drink. However with inaction regret, i.e. regret over not drinking, there are no potential negative health outcomes, findings suggest even low amounts of alcohol consumption increase the lifetime risk of morbidity and mortality (Rehm et al., 2009). Therefore expectancy-value models may be redundant in providing explanation as to how inaction regret (i.e. FoMO) may influence drinking decisions - as there are no associated negative health consequences from not drinking, there is no associated feelings of regret to heighten risk perceptions.

In lieu of considering FoMO (inaction regret) in the context of expectancy-value models, we can assess different reasons for why FoMO may motivate engagement with drinking. Firstly, consuming alcohol in a social setting may serve to satisfy our basic human needs as outlined in self-determination theory (Deci & Ryan, 1985), we may feel a heightened sense of competence, autonomy and relatedness, especially considering that young adults are often motivated to consume alcohol to enhance social interactions and create strong social bonds (de Visser, 2021). Additionally, as those high in FoMO tend to spend more time on social media and the internet, there is a possibility they are exposed to more alcohol-related events, advertisements and influencers (Hendriks, et al., 2020), this effect may be especially apparent as only positive images of alcohol are posted on social media, with very little focus on the negatives associated with drinking (Lyons et al., 2018). Finally, those high in FoMO may be more willing to engage with drinking, simply to avoid potentially missing out on fun and bonding opportunities, compared to those lower in the trait; social and conformity drinking motives such as *'so you won't feel left out'* have been shown to predict consumption (Cooper, 1994). Moreover the experience of FoMO can give to negative affect over missing out on opportunities for social benefits (Milyavskaya et al., 2018). According to the incentive motivation model, we are motivated to seek positive incentives and avoid negative ones (Cox & Klinger, 1988). In the case of FoMO it may provide a form of aversive motivation, in which we are motivated to avoid the negative affect caused by feelings of social isolation/exclusion and in turn motivated to seek the positive affect from the feeling of social inclusion garnered from attending social events. However this suggestion has yet to be established in the literature.

FoMO and Alcohol

Very little research has been conducted to examine the relationship between FoMO and alcohol consumption, and the evidence regarding its association with drinking is conflicting:

unpublished work from Webb (2016) found no association between FoMO and alcohol-related consequences when accounting for extroversion, neuroticism and Greek letter society membership, whilst Zunic (2017) report FoMO was not associated with consumption using retrospective assessments in individuals aged under 21. Furthermore peer-reviewed research highlights inconsistencies; Riordan et al. (2015) conducted two studies, one using a cross-sectional design and a second prospective diary study. In both studies, FoMO was not associated with drinking quantity and frequency, however from the prospective assessment they were able to demonstrate that higher levels of FoMO had a small-sized association with consuming more alcohol in a single session ($r = .17$). Moreover, for both studies, Riordan et al. (2015) report higher levels of FoMO are associated with experiencing more alcohol-related consequences. In a follow-up study, Riordan et al. (2019) examined the relationship between FoMO and alcohol during orientation week (freshers in the UK), a time when social events/activities are salient for university students. They report FoMO did not predict breath alcohol concentration, number of drinks consumed, or time spent drinking. Nonetheless they report participants who experienced FoMO were more likely to report consuming alcohol (OR = .62, 95% CI, .48-.80, $p < .001$), whilst accounting for age and gender. Furthermore using a retrospective assessment of FoMO's relationship with orientation week drinking, they report FoMO was associated with alcohol consumption and experiencing alcohol-related consequences during orientation week. A further study by Brunborg et al. (2021) examined the relationship between FoMO and binge drinking (i.e. consuming 5 or more standard drinks per session – 12 to 15 grams of pure alcohol per drink) in adolescents, whilst accounting for potential confounds (sensation-seeking, depressive symptoms, and self-regulation). They report FoMO was associated with a greater risk of binge drinking, whilst controlling for the fore-mentioned confounding variables (relative risk ratio = 1.28, 95% CI, 1.14, 1.43, $p < .001$).

The evidence regarding FoMO's predictive validity for alcohol consumption is mixed, existing evidence suggests an association with single-session consumption, consuming any alcohol, risk for binge-drinking and importantly an increased risk for negative consequences. Interestingly the alcohol-related consequences with the strongest relationships with FoMO are the ones typically regretted as outlined by Davies and Joshi (2018), e.g. '*said embarrassing things*' or '*had a hangover morning after*', suggesting FoMO may be a risk factor for experiencing regrettable consequences, i.e. inaction regret may drive the risk of experiencing future action regret. Although this evidence suggests a relationship between

FoMO, consumption and consequences, attempts to predict consumption or plans for future drinking are sparse, and they have resulted in non-significant associations (e.g. Riordan et al., 2019).

A key limitation of current FoMO-alcohol studies may explain why they have been unable to predict consumption; they have all assessed FoMO using a single measure, failing to acknowledge the possibility that FoMO levels may fluctuate (Milyavskaya et al., 2018). Assessing FoMO using a single measure means we have not been able to assess if within-person fluctuations in FoMO influence consumption. For example, the day after a missed event, levels of FoMO may be higher and hence may have a greater impact on future plans and behaviour. The thesis will seek to address this gap and examine the relationship of FoMO as a state variable with alcohol consumption. Considering links between FoMO and an increased risk for harmful drinking patterns and negative consequences, a more robust examination of the relationship with alcohol is warranted.

A further limitation of the literature is it has rarely considered what drives the sense of missing out in this specific context. As suggested by Przybylski et al. (2013), those experiencing FoMO may perceive missing out on rewards from their immediate and wider social environment. Nonetheless research has yet to fully explore what exactly young adults perceive they are missing out on from non-attendance at alcohol-related social events. Considering extant alcohol literature we can speculate that alcohol is invariably a central part of most social gatherings (Davies et al., 2018; de Visser et al., 2013; Rudolfsdottir & Morgan, 2009) and consuming alcohol socially helps young adults to establish social groups and create shared identities (Griffin et al., 2018; Guise & Gill, 2007). Alcohol plays an important role in creating identities and social groups in two ways. First, alcohol consumption enables lowering of inhibitions and enhances the social bonding process through increased trust, intimacy, compassion, and support (de Visser et al., 2013; Dresler & Anderson, 2017). Second, the acts associated with consumption provide the social capital needed to create and strengthen bonds and identities, such as sharing stories, drinking rituals (e.g., drinking games) and caring for drunken peers (de Visser et al., 2013; Dresler & Anderson, 2017). It may be that FoMO from missing opportunities to drink socially is underpinned by a desire to avoid missing out on the social benefits garnered from consuming alcohol socially. Considering that alcohol consumption is deemed as a social imperative for young adults but also that FoMO may provide an aversive form of motivation for future drinking, it is important to explore what underpins this risk factor for excess drinking.

In addition there is a lack of research into the impact of context on FoMO. To date one study has examined contextual effects. Milyavskaya et al. (2018) demonstrated that FoMO is experienced at a similar extent regardless of the type of planned activity (i.e., the activity causing us to miss an alternative), namely seeing a friend, completing an assignment or reading. In addition they were also able to show that social activities such as meeting a friend elicited greater amounts of FoMO compared to a non-social activity such as watching TV. Furthermore they were able to demonstrate FoMO levels were similar when social information about the missed event was prompted either by social media or directly from a friend. Highlighting FoMO can be experienced without social media. Nonetheless the literature has yet to establish the comparative impact of missing out in alcohol-related contexts. Considering that previous evidence indicates alcohol consumption plays a principal role in forming social groups and identities but also that it is perceived to help form closer social bonds than other social activities (de Visser et al., 2013; Griffin et al., 2018) it is important to establish the magnitude of FoMO from missing out on social drinking events. Furthermore by testing if alcohol related FoMO can be manipulated, it would lay the foundation for targeting it in an intervention to reduce excess drinking (along with identifying the underlying perceptions of missing out). Especially as the sense of missing out is completely psychological (Przybylski, et al., 2013), meaning it may be modifiable.

The thesis has four aims: (1) to investigate why experiencing regret consequences fails to consistently impact future consumption; (2) to explore if regret is experienced from missing opportunities to drink socially and if so, (3) to investigate how this experience of regret impacts drinking intentions and alcohol consumption and (4) to test if this experience can be manipulated. Conducting research to address these aims will help us to better understand why action regret fails to inform future drinking behaviour as well as exploring if inaction regret (FoMO) is experienced, and if it informs drinking intentions and consumption.

Chapter three presents the findings of a qualitative study that used focus groups to explore why experiencing alcohol-related regret fails to inform risk appraisals and future drinking decisions, and also explored if young adults experience inaction regret (FoMO), when they missed opportunities to consume alcohol socially.

Chapter four sought to expand on the findings of chapter three by using qualitative interviews to explore individual's reasons for the experience of FoMO in alcohol-contexts, and how they cope with the negative affect associated with their FoMO.

Chapter five used ecological momentary assessment to determine the relationship between FoMO and alcohol in naturalistic and real-world setting and record fluctuations in FoMO, hence enabling an examination of FoMO as a state variable.

Chapter six reports results of a study testing an experimental manipulation of FoMO to assess contextual effects but also to examine if the construct can be experienced irrespective of regret, with the aim of identifying FoMO as a potential modifiable intervention target.

Chapter seven provides a discussion of the thesis results. Initially starting with a general overview, followed by discussions for each thesis study, ending with considerations for future research.

Chapter Two

Research Methods and Techniques

This chapter provides an overview of the research designs, methods and techniques used in the thesis. A rationale for the use of mixed methods to achieve the research aims and objectives is presented, along with presenting the methods/techniques and data analyses used to achieve the study aims.

Rationale for a mixed methods approach to investigating young adults' alcohol-regrets

Historically quantitative methods have dominated health research, however since the mid-1990s, qualitative methods have been accepted by researchers in the health domain, resulting in a rise of published qualitative studies. Since the merits of adopting qualitative methods to explore health issues has been recognised, there has been a growing interest in combining quantitative and qualitative methods (Tariq & Woodman, 2013). This however has led to a debate over whether the two methodologies with opposing epistemological and ontological positions are compatible. For example quantitative methods typically adopt the scientific method, in which empirical measures are used to test 'a priori' hypotheses, resulting in observable and measurable facts, hence reality is viewed as objective and uniform (Yardley & Bishop, 2017). In contrast qualitative methods typically assume that knowledge about the world is shaped and influenced by personal viewpoints, contexts and meaning; hence reality is viewed as subjective and constructed in terms of our individual experiences within the context of our socio-cultural environments (Yardley & Bishop, 2017; Tariq & Woodman, 2013).

The differing positions suggest the two methodologies are diametrically opposed, however there is an argument that each method can complement what the other lacks (Creswell et al., 2011; Tariq & Woodman, 2013). For instance, quantitative methods typically use prescribed and replicable measures to study phenomena in controlled experimental settings, hence they have high internal validity. Nonetheless examining phenomena in controlled environments means external validity is reduced, i.e. corresponding to real-life situations. Conversely qualitative methods are less controlled and aim to account for the subjective and personal

meaning of phenomena, hence they have high external validity (Yardley & Bishop, 2017; Tariq & Woodman, 2013). Therefore by combining the internal validity of quantitative design with the external validity of qualitative, we can address research questions in a more comprehensive way to provide nuanced understandings of health issues, compared to using each approach separately (Tariq & Woodman, 2013).

Traditionally alcohol research has used quantitative methods to establish a pathological model for young adults' drinking behaviour, in which cognitions (e.g. alcohol beliefs) or dispositions (e.g. personality traits) have been identified as driving the risk for harmful drinking (i.e. drinking at a level that increases the risk for dependency and significant health issues) in young adults (Conroy & Measham, 2019). Nonetheless such empirical findings may be isolated from real world contexts and using quantitative methods alone cannot comprehensively reflect the complexity of the various contextual factors that influence young adults' alcohol consumption. For example alcohol's varied role in social rituals and social bonding (Dresler & Anderson, 2017; de Visser et al., 2013). To gain a more complete understanding of how regret influences alcohol perceptions and behaviours there is a need to conduct research that is replicable but also ecologically valid, through the use of quantitative designs, complimented with qualitative studies to explore real-life experiences of alcohol-related regrets. Therefore in this thesis I used qualitative methods to explore lived experiences of action and inaction regrets, in combination with quantitative methods to examine the relationship between inaction regret and consumption, along with assessing the impact of contextual factors.

Rationale for research methods and design

Semi-structured Interviews

The first study conducted in the thesis used a semi-structured question schedule in a series of focus groups, to explore why experiences of alcohol-related regret fail to inform risk appraisals and future consumption, along with exploring if inaction regret in the form of FoMO is experienced over missing out on opportunities for social drinking. The second study in the thesis used semi-structured interviews with individuals, to explore experiences of alcohol related FoMO in finer detail and to build upon the findings of study one. The data obtained from the semi-structured interviews regarding FoMO was used to generate content for the vignettes created for the fourth study. This approach shows the value of using data from one methodological approach to inform another.

Interviews are typically the preferred method of collecting qualitative data and can be used individually or in groups (Willig, 2017). The popularity of interviews has given rise to a debate over the role interviews have in qualitative research. For instance Potter and Hepburn (2005) highlight that data drawn from interviews is often taken at ‘face-value’, whilst frequently failing to account for the contextual features of the interview material (e.g. interactional features of a dialogue, its status as a conversation between people and the investment participants have in the interviews). Therefore throughout my analyses of the interview data I have attempted to reflect on the meaning and experience of the interview for both the participants and myself. I do not make any claims that I have direct access to participants’ true thoughts or feelings.

Within the qualitative literature there is a debate regarding the relative merits of focus groups over individual interviews. For example the interpersonal and interactive nature of focus groups enables a larger dialogue amongst individuals, often resulting in the generation of a wider range of ideas and viewpoints that would be difficult to capture using individual data collection methods (Guest et al., 2017). Focus groups were selected as the data collection method for study one for the following reasons. Young adults often consume alcohol in social contexts and perceive that social drinking plays a role in creating and strengthening social bonds/groups (de Visser et al., 2013; Dresler & Anderson, 2017; Lyons et al., 2018); hence group discussions, i.e. a social context, may be apt for collecting data on experiences of consuming alcohol. Guest et al., (2017) highlight the efficacy of using focus groups to capture sensitive and personal disclosures, therefore this data collection method should enable the collection of personal experiences of regret, which often can be sensitive in nature (Davies & Joshi, 2018). Finally for study one, because FoMO is a reactionary state based on social information (Reagle, 2015), I deemed group discussions may provide a suitable, social context for discussing and exploring if young adults experience this social phenomenon. Furthermore the chosen sample group were all at a comparable age, and likely to be experiencing similar life stressors, e.g. entering university, or living away from the parental home for the first time, hence this should reduce any issues in cultivating a meaningful dialogue.

In contrast, the debate for the merits of individual interviews over focus groups highlight this data collection method results in greater detail than focus groups and enables a deeper insight into a participant’s personal views, feelings, thoughts, and experiences (Guest et al., 2017). Therefore single participant interviews were deemed as the preferred data collection method

for study two, as this study aimed to build upon the findings of study one and explore in greater depth what underpins personal experiences of FoMO. Furthermore study two aimed to explore coping strategies for experiencing the negative affect associated with FoMO. Using an individual data collection method is well suited to exploring coping strategies, as reactions to adversity and distress are informed by a unique combination of our personality, subjective perceptions, life experiences and age (Carver & Connor-Smith, 2010; Lecic-Tosevski et al., 2011). Therefore single participant interviews were chosen to enable the collection of rich data that has enough depth to reflect the complexity of coping responses.

Developing Interview schedules

In creating the interview schedules for study one and study two I initially considered what the overarching aims of the studies were, i.e. exploring *personal* experiences of alcohol-related action and inaction regrets; hence the schedules were constructed in a way that balanced the pertinent questions with allowing enough freedom for the participants to discuss their experiences in depth. To achieve this, both schedules were short and began with broad questions that enabled the participants to set the strictures of the topic, ensuring that I did not impose my own preconceptions of the phenomena on the participants' narratives. Both schedules used open questions with a few prompts, for example, "*Can you tell me about a recent experience where you were drinking alcohol?*", prompt – "*who were you with, what happened, why did you act/react that way?*". The interview questions were based on empirical findings that highlight the contexts in which young adults drink and evidence regarding the types of regrets they report experiencing (Davies et al., 2018, Davies & Joshi, 2018). All questions were reviewed and agreed as acceptable with the primary supervisor.

Ecological Momentary Assessment

Study one and two used qualitative methods to explore how young adults' experiences with FoMO influence their thoughts about alcohol consumption. To further explore young adults' FoMO I sought to use quantitative methodology to assess if the construct predicts alcohol consumption and drinking intentions. However due to the ephemeral nature of FoMO traditional survey methods may be unsuitable, hence a data collection technique that enables fluctuations in FoMO to be recorded is warranted. To achieve this ecological momentary assessment (EMA) was used to record fluctuations in FoMO (e.g. the day after a missed event) to enable an assessment of the impact on drinking intentions and consumption.

Traditionally, research seeking to predict and understand alcohol consumption has collected measures of psychological predictors using one-off surveys administered in non-drinking context, such as labs, lecture theatres or libraries (Cooke, et al., 2007; Gerend & Cullen, 2008), several days in advance of consumption. Cooke and French (2011) note that both aspects of this approach can affect the prediction of psychological outcomes; they found measures completed in a drinking context (i.e. a bar) yielded different scores for measures of predictor variables than the same measures completed in the more typical non-drinking context (library). Furthermore measures completed with reference to a shorter timeframe (e.g. tonight) yielded different scores to measures completed with reference to a longer timeframe (e.g. next week). This highlights a need to measure predictors in drinking contexts, as close to performance of consumption as possible, to enhance the accuracy of such measures.

While self-reports measures of alcohol consumption such as the Timeline Follow-Back (TLFB) have been shown to be reliable (Sobell & Sobell, 1992), they are prone to recall bias and are unable to examine dynamic changes in drinking behaviour over time and across contexts or situations; for example alcohol consumption is influenced by immediate environmental factors such as alcohol-related cues (Jones et al., 2013) and/or internal states such as stress (McGrath et al., 2016). Modelling of these factors is not possible, either logistically or ethically in traditional survey studies, where variables are measured on a single occasion. An alternate to using traditional self-reports is EMA, which typically assesses participants' behaviour and beliefs in real-time, in the real-world, over time and across contexts (Shiffman et al., 2008), hence increasing our ability to describe and understand drinking, but also to contextualise consumption in everyday life (Jones et al., 2020; Epler et al., 2014). For example, Jones et al. (2020) assessed whether engagement with regrettable drunken behaviour predicted future drinking plans (i.e., intentions). Using EMA, Jones et al. (2020) were able to measure and assess discernible small-scale events, such as a hangover and how the real-time experience of such an event, in a real-world context, influenced future drinking plans. A nuanced analysis of this kind is simply not possible with traditional assessment methods.

For the third thesis study, EMA was deemed as an appropriate assessment method to capture fluctuations in FoMO in real-time and in ecologically valid contexts. It is plausible to expect that FoMO levels will fluctuate within young adults, depending on their recent experiences. One should not expect FoMO when one has recently attended a social drinking event, whereas missing the latest party should prompt FoMO. In study three I adopted a repeated

measures design, which enabled a repeated measurement of behaviour and the constructs over a specific time period, i.e. times when drinking is most likely to occur, Thursdays, Fridays and Saturdays (Kuntsche & Labhart, 2012). Using this design type enabled an analysis of the within-subject changes in behaviour across time and context, hence a clear advantage over extant FoMO-alcohol literature that has used single measurements (Brunborg et al., 2021; Riordan et al., 2015, 2019). Furthermore this design enabled an analysis of FoMO as a state variable, which is important to assess due to the experience of FoMO being a reactionary state, i.e. it's experienced when we receive social information regarding a missed event (Milyavskaya et al., 2018; Reagle, 2015). Previous studies have yet to explore how the experience of FoMO as a state variable influences our decisions for drinking and alcohol consumption. The use of EMA with a within-subjects design should enable me to meet the aim of examining the relationship of FoMO in a real-world context by recording the ebb and flow of real-life experience as it happens over time, as a means to characterise individuals' drinking behaviour and assessing the dynamics of their experiences over a specific timeframe.

Vignette Experiment

Study four aimed to build on study three, which used a repeated data collection technique to *measure* FoMO, enabling an assessment of its predictive validity for drinking intentions and consumption. To further develop our understanding of the relationship between FoMO and alcohol I examined if it was possible to *manipulate* FoMO experimentally. To achieve this aim, I used a vignette experiment which is a combination of a traditional survey with an experimental element. Using vignettes, I sought to explore how context influences FoMO, but also if FoMO scores will be experienced at a greater intensity than regret scores when assessed following exposure to vignettes designed to prompt FoMO.

Vignettes are short, precisely composed descriptions of a person, object or situation, which represent a systematic combination of characteristics that aim to simulate a real-life scenario (Atzmuller & Steiner, 2010). Vignette studies are a hybrid of experimental and survey methods, in which participants are presented with simulated scenarios and are asked to provide judgement in order to elicit their beliefs, attitudes and quite often behavioural intentions (Gerend & Cullen, 2008; Kingsbury et al., 2014). Using this hybrid approach means the vignette technique can offer both aspects of high internal validity of experimental

design and the high external validity of survey-based research (Atzmuller & Steiner, 2010; Evans et al., 2015).

Vignette studies attempt to simulate real-life experiences and scenarios (Atzmuller & Steiner 2010); the artificial representation of real-life created in vignettes, has led to a debate over whether findings from vignette studies are representative of the real world, hence questioning their validity (Hughes & Huby, 2004). Nonetheless we must consider that vignette experiments do not aim to recreate real-life situations or experiences but rather aim to simulate them, enabling us to measure or assess our real-world decision-making processes (Hughes & Huby, 2004). In addition, vignette studies do not aim to assess real-life behaviour but rather proxies of behaviour or strong predictors (e.g. drinking intentions) regarding the situations approximated in the vignettes (Kingsbury et al., 2014). Furthermore, evidence suggests that individuals often respond to hypothetical and real-life scenarios in a similar fashion; a meta-analysis ($k = 111$) by Murphy et al. (1986) found that reports of behaviour in vignette experiments were comparable to observations of real-life behaviour.

For the above reasons I selected a vignette experiment to meet the aims of study four; specifically the vignette technique has the potential to elicit the same thought process we engage with when we experience regret or FoMO in the real-world, i.e. counterfactual thinking. For example a scenario aiming to examine experiences of FoMO, could ask us to imagine we are engaged with an activity such as work or study, and then present us with details of an on-going social event/activity. To consider if we would experience FoMO from the scenario would require us to engage with counterfactual thoughts, in which we compare thoughts of 'what could be' from alternate activity, with thoughts of 'what is' from the activity we are asked to imagine being engaged with. This has the potential to enable access to a thought process that influences real-world decision making, hence it was deemed as apt to examine subjective perceptions of FoMO in different contexts. Furthermore using hypothetical situations should minimise ethical risk, a hypothetical sense of FoMO should not produce (or at least minimal amounts of) the associated negative affect that is often experienced from FoMO in the real-world.

For the vignette experiment I used a mixed design; the independent factor is the context of the scenarios (i.e. alcohol-related, non-alcohol and control), the repeated-measures factor is experience type (i.e. social, novel and comparable) and the dependent variable is emotion (i.e. FoMO, regret and AR). The independent factor enables an overall assessment of how

different contexts impact ratings of FoMO. The repeated-measures factor, emotion enables an overall assessment of FoMO being experienced irrespective of regret. However the inclusion of a control condition, enables a more sophisticated assessment of FoMO being experienced irrespective of regret, i.e. it enables an assessment of how context and emotion interact. Furthermore the inclusion of the additional repeated-measures factor, experience type enables a deeper investigation into the contexts for missing out, i.e. it enables an assessment of how the types of experiences associated with FoMO for young adults, interact with the various contexts for missing out. For these reasons a mixed design was deemed as the most applicable.

In designing the vignettes I attempted to account for and minimise potential validity issues, by ensuring the content of the vignettes reflect real-world experience and are relevant to the chosen sample. The content of the vignettes has been informed by the results of studies one and two, along with empirical evidence regarding FoMO (Milyavskaya et al., 2018; Przybylski et al., 2013); which highlights in what contexts young adults experience FoMO and the methods of receiving the social information. This helps ensure the vignettes remain as close as possible to the reality of young adults' FoMO experiences. A final consideration to ensure validity issues were minimised was the use of a pilot experiment, i.e. testing if manipulations work in a priori study increases the chance of effectiveness in a larger sample. Details and results of the pilot work are outlined in the start of chapter six.

Participant sampling and screening

For all studies a purposive sampling method was used to recruit young adults, aged 18 to 30 years old. Individuals with a diagnosis of an alcohol use disorder were excluded, for ethical considerations. To help identify and screen those who may be at risk, the AUDIT (Saunders et al., 1993) was administered prior to each study. The AUDIT is ten-item scale that assesses consumption patterns (e.g. “*How often do you have a drink containing alcohol?*”) and alcohol-related harm (e.g. “*Have you or someone else been injured as a result of your drinking ?*”). Each item is scored from 0-4, with a total possible score of 40. The WHO guidelines highlight scoring ranges;< 8 indicates low-risk drinking, scores >8 are indicative of hazardous and/or harmful drinking, with a risk of dependence. A score >20 highlights possible alcohol dependence, and referral to support services is advised. The thesis aimed to recruit participants scoring >8 and <20. The AUDIT is a widely used and reliable screening tool for assessing problem drinking and potential risk, highlighted by a high degree of

internal consistency, ranging from .75 to .97 (Reinert & Allen, 2007) and a high test-retest reliability (Dybek et al., 2006).

Participants were recruited via two routes, (1) a research pool from the University of Liverpool, and (2) recruitment websites, 'Call for participants' and 'Prolific'. The smaller samples from study one and two were recruited from the research pool, whilst the larger sample in study three was recruited using a mix of the research pool and recruitment websites. Study four recruited using the research pool only. Participants in all studies received reimbursement for their time. Although there is a debate regarding whether an incentivised study results in bias (Whiting, 2008), it was deemed the time and effort required to participate was worthy of a reward. For example, study four used repeated measurement method of EMA and hence was labour intensive. Evidence indicates EMA studies offering an incentive generally result in higher compliance rates (Jones et al., 2019). For studies one, two and four, participants received course credit for their participation. For study three participants received either course credit, a monetary sum based on a pay scale set by the recruitment site or were entered into a prize draw to win a £20 shopping voucher.

Rationale for data analysis

Interview data

The focus group and interview data were analysed using Interpretative Phenomenological Analysis (IPA; Smith, 2004). IPA is a qualitative technique underpinned by phenomenology, as it seeks to explore individuals' lived experiences and how they make sense of their reality (Smith, 2004). IPA acknowledges the pivotal role of the analyst in the 'sense making' of participants' personal experiences, hence it is strongly influenced by hermeneutics; Smith (1996) highlights how research conducted with humans, results in a double hermeneutic, i.e., the participant is making sense of their personal and social environment, in turn the analyst is attempting to make sense of the participants' interpretations of their reality. The result of an IPA study is a set of themes that are generated from the participants' narratives, that encapsulate the conceptual sentiment of their experiences, highlighted by their direct quotes and the analyst's interpretations (i.e. the double hermeneutic loop).

Study one aimed to explore why personal experiences of alcohol-related regret fails to impact risk appraisals and future consumption, along with exploring if young adults experience FoMO from missing social drinking events. As IPA seeks to explore personal, lived experience and how individuals make sense of those experiences it may be an apt choice for

meeting the aims of study one. However in study one I chose to use focus groups in lieu of individual interviews, although focus groups have the potential to provide rich experiential data (Guest et al., 2017) there is a potential issue, i.e. how can we extrapolate the individual, personal narrative from the group narrative along with separating the multiple hermeneutics occurring in a group discussion?

Smith (2004) suggests caution when attempting to draw accounts of individual experience from a group setting, however they add that the decision to use focus groups in an IPA is dependent on the topic, the analyst's skill, the characteristics of the participants and how the analysis is modified. Nonetheless focus groups have the potential to enhance personal narratives (de Visser & Smith, 2007; Flowers et al., 2001) from the peer-to-peer interactions and the rapport developed through sharing similar experiences, especially when the sample is homogeneous (Love et al., 2020) and are currently experiencing similar life stressors faced during emerging adulthood. For example the participants recruited had all recently started university and the majority had moved to a new city and living accommodation. Therefore it was deemed that sharing similar experiences could help illuminate the personal narratives through shared expressions of the topic, especially considering that the defining quality of existing in the world (i.e. the central tenet of hermeneutic phenomenology) is relatedness (Palmer et al., 2010).

In addressing the issue of using focus groups in an IPA, I made the following considerations. The first consideration to ensure personal narratives are extrapolated is limiting the group size, Githaiga (2016) report that a focus group of 13 was arduous to manage and advises that smaller groups should enable participants to discuss in greater detail their personal experiences. Therefore in study one, participants were separated into three smaller groups: group one, N = 5, group two, N = 5 and group three N = 3. Using smaller groups made it easier to make notes on group dynamics and interactions, this was used as an aid in evaluating idiographic accounts in the analytical stage. Secondly, I was cognisant of my responsibility as the facilitator to manage group dynamics, for example I carefully listened to the flow of the discussion and interjected or redirected questions from group members dominating the discussion to those who spoke less frequently. To ensure each participant provided experiential data, they were asked to discuss their first experience of drinking alcohol, a recent experience where they drank alcohol, and a recent experience where they missed out on a social drinking event. Following each individual narrative, I opened the

discussion to the group with follow-up prompts, e.g. “*Can anyone else tell the group about a time they experienced regret over a similar act?*”.

A key advantage of IPA over other qualitative techniques such as discourse analysis or thematic analysis is that there is no prescribed method for working with the data (Smith, 2004). Instead IPA had a degree of flexibility and a set of common precepts that can be adapted to suit the analytic task at hand (Reid et al., 2005). Considering this, the analytic stage of the IPA in study one was adapted to meet the challenges of applying an experiential data analysis to the more complex social nature of a focus group (i.e. the multiple hermeneutics of group interactions). The analysis used was adapted from the procedure outlined by Palmer et al. (2010) which enabled me to explore the experiential and the interactional elements of the focus group data. Further information regarding the specific steps taken in the analysis for study one is available in the relevant chapter of the thesis.

In study two I aimed to further explore experiences of alcohol related FoMO in greater depth, specifically exploring what underpins the experience and coping strategies for dealing with the associated negative affect. Due to the nature of IPA, in that it aims to illuminate lived experiences and how individuals make sense of those experiences, it was deemed as the most appropriate qualitative analysis technique, for example an IPA analysis could help illuminate how it is to experience FoMO and what drives the experience. In contrast other techniques such as thematic analysis would be more appropriate if the purpose of the research was to identify commonalities in how young adults experience and cope with FoMO (Braun & Clarke, 2008). In conducting the single participant interviews and data analysis I followed the guidance outlined by Smith et al. (2009). The relevant thesis chapter for study two outlines the specific steps taken in the interviews and analysis.

Reliability in qualitative research

In the literature there is a debate surrounding reliability and rigour within qualitative research. For example it has been criticised for lacking the scientific rigour of quantitative designs, due to a lack of transparency, the analytical practices, and the potential for researcher bias on the findings (Noble & Smith, 2015). These concerns are further compounded by the issue of how scientific rigour should be judged, with no clear consensus on a specific procedure (Rolfe, 2006).

Despite the lack of a consensus for judging scientific rigour in qualitative research, specific issues should be addressed, namely reflexivity (the impact the researcher has on the data) and transferability (dissemination of the findings and application to other settings) (Malterud, 2001). Reflexivity refers to how our own preconceptions, beliefs and experiences influence and shape the research (Finlay, 1998). To account for any potential bias, researchers should make clear how their background and beliefs may influence the data collection and analysis (Smith et al., 2009). The issue of transferability in qualitative research has been debated; qualitative research can never be fully replicated as the data and findings generated are a direct result of the approach used by the interviewer, the unique interactional elements of a discussion between individuals, the context of the interview and the skill/experience of the analyst (Finlay, 2006). This suggests traditional assessments of reliability and validity may not be relevant. Nonetheless it has also been suggested that qualitative research can be assessed using criteria that is universal in both quantitative and qualitative research, namely validity and relevance (Mays & Pope, 2000).

I attempted to address these issues in several ways. I engaged with reflexivity throughout the research process. Initially I used a reflexive diary to consider my preconceptions regarding the topic and how my past experiences with alcohol could influence my judgements. After the initial entry I continued with the diary to contemplate how my personal experiences with conducting the interviews shaped their outcomes and also when completing the data analysis. Furthermore I engaged with reflexive discussions with the primary supervisor, specifically discussing my preconceptions and concerns prior to data collection, but also during data collection and throughout the analytic stage. For example before the commencement of the focus groups/interviews we discussed the content of the schedules and after the initial focus group/interview we considered how to adjust questions or prompts to ensure participants could provide detailed answers as possible.

In addition, I attempted to ensure validity by making the methods of data collection and the analysis as transparent as possible. For example during the analytic stage I presented the master table of themes to the primary supervisor and discussed my reasoning for grouping the individual themes into super-ordinate themes. From these discussions the final themes were reviewed and developed between myself and the primary supervisor. Finally in consideration of transferability, I attempted to ensure that the sampling strategies used were purposeful and relevant to the research questions and chosen sample. The purposive sampling method was applied to recruit young adults in the UK, aged 18 to 30, who were at risk of experiencing

alcohol-related harms. Young adults were recruited locally at the host university and nationally through the research websites, 'Call for participants' and 'Prolific'.

EMA data

In study three I aimed to examine the relationship between FoMO and drinking behaviours in the real world and in real time using EMA, which enabled me to record ecologically valid data. I used multilevel modelling (MLM) to analyse the data collected using EMA. Fixed linear statistical models such as multiple regression or ANOVAs, assume data is organised at a single level, however in the real-world data is often hierarchical, in other words the variables we test are often clustered or nested within other variables. For example the location, time of day or the day of the week that participants respond to drinking measures can impact responses (Cooke & French, 2011), hence contextual variables influence outcomes. MLM is statistical analysis technique that can be used to factor in contextual variables when testing outcome variables.

MLM enables us to model data hierarches by allowing for residual components at each level in the hierarchy (Kristjansson et al., 2007). For example we may be interested in examining if the type of pub we drink at influences alcohol consumption. In this example a two-level model which enables the grouping of participant outcomes (e.g. alcohol consumption or intentions) within the different pubs would include residuals at the participant and pub level. The residual variance is divided into a between-pub component (i.e. the variance of the pub-level residuals) and a within-pub component (i.e. the variance of the participant-level residuals). The residual scores from the pub level represent unobserved pub characteristics (e.g. is the pub quiet or full? the cost of drinks etc.) that impact participant outcomes (e.g. level of consumption). The unobserved variables lead to a correlation between outcomes for participants drinking at the same pub, hence enabling us to build a model to assess if a contextual variable such as this impacts the outcomes.

Study three adopted an intensive longitudinal design, wherein I repeatedly assessed participants responses over time and correlated them with each other. The suitability of using MLM to analyse the EMA data over other repeated measures techniques was judged on the following criteria. Firstly, the ability to model contextual variables afforded by MLMs is well suited to the real-world and real-time data collected in an EMA, i.e. it enabled me to model how context influences the outcome variables. For example if experiences of FoMO are stronger in certain times of the day, will this have a larger impact on drinking intentions?

Building an MLM will enable the modelling of how the time of day interacts with FoMO to influence intentions. The nature of EMA is labour intensive, participants are required to complete a large quantity of repeated measures, compared to traditional survey methods, along with completing the measures in ecologically valid settings and in real time (Jones et al., 2018). An issue with this is the potential for missing data, for example a participant may be asked to complete a survey during working hours or when they are engaged with another activity such as driving (Jones et al., 2018). A key advantage of MLM over other analyses is they don't require a balanced design, hence the missing data that will invariably ensue from an EMA will not impact the analysis to the extent that it would in other repeated measures designs. MLMs do not require full data sets are able to successfully estimate parameters with the available data (Kristjansson et al., 2007; Perski et al., 2022). Additionally an advantage of MLMs over other models is that by considering contextual variables and by factoring them into the analysis, we can account for the issue of non-independent observations. MLM enables us to model the relationships between the residuals, reducing the potential for type I errors and enabling the building of more robust models (Wainwright et al., 2007). The specific steps taking in building the models are outlined in the relevant thesis chapter.

Vignette data

In study four I aimed to examine if different contexts (i.e. alcohol-related, non-alcohol and control) and types of experiences (i.e. social, novel and comparable) impact perceptions of missing out, along with assessing if FoMO can be experienced irrespective of the latent construct regret. To assess these aims I used a mixed design ANOVA, which combines an analysis of repeated-measures and independent measures (Judd et al., 2017). This was deemed as apt for the purpose of study four, as it enabled inferences to be made for both the independent and repeated-measures factors. However the biggest advantage for using this omnibus test was the possibility of analysing interactions between the independent and repeated measures factors, thus enabling a nuanced analysis of how context, experience type and emotion interact. For example using this analysis can enable the running of a 3-way interaction from which inferences can be made regarding in which context and during which type of experience FoMO is most keenly felt.

Chapter Summary

This chapter has discussed the thesis aims, the methods of data collection and analysis for each individual study. The chapter has outlined the rationale for adopting a mixed approach and highlighted how the application of the qualitative and quantitative methods can be used to meet the aims of the research.

Chapter Three

“You see the pictures the morning after and you’re like I wish I was in them” – An Interpretative Phenomenological Analysis of University Student’s alcohol-related Regrets.

This chapter presents a qualitative study exploring lived experiences of alcohol-related regrets, which has been published in *Psychology and Health* (2022). The formatting of the original article has been adapted to ensure consistency with the work presented in the rest of the thesis, however the content from the published article remains. Richard Cooke approved the interview schedule created by myself, which I used to conduct three separate focus-groups. I completed the analysis and write up of the data by myself, afterwards Richard Cooke, Andrew Jones and Abigail Rose (co-authors) provided feedback before submission and in response to the journal reviewers’ comments.

The aim of this study was to explore why lived regrettable experiences fail to inform future drinking plans or consumption, and also to explore if young adults experience inaction regret from missing opportunities to drink socially in the form of FoMO.

Abstract

Objectives: University students report experiencing regrettable health and social outcomes following excessive alcohol consumption. Students also report experiencing regret when they are unable to attend drinking events. This study explored how such experiences influence risk appraisals and decisions about future alcohol consumption.

Design and Measures: Thirteen university students (69% female, 18-20 years old) discussed the interplay of regret with alcohol consumption, and nonattendance at drinking events, in one of three focus groups. Transcripts were analysed using Interpretative Phenomenological Analysis (IPA).

Results: IPA produced three super-ordinate themes: “It’s not something I would have done sober”, “Attitudes towards action regret” and “Fear of Missing Out (FoMO)”. Participants reported regrettable experiences (e.g., alcohol poisoning, tattoos), and a gender difference in risk appraisals was apparent. Attitudes towards action regret affected risk appraisals and informed future drinking decisions. Participants reported experiencing FoMO when they were unable to attend drinking events.

Conclusion: Regrettable incidents following excessive consumption were seen as common but did not affect risk appraisals or future drinking decisions. Students reported they preferred the regrettable experiences that follow excessive consumption than the FoMO experienced when they were unable to attend drinking events, suggesting FoMO may drive attendance at future drinking events.

Introduction

Alcohol consumption is driven by a range of external (e.g., marketing, peer drinking, policies) and internal (e.g., genetics, attitudes, risk appraisals, peer norms) factors (see Sudninaraset et al. 2016, for a review). Individuals report alcohol consumption allows them to obtain benefits such as increased sociability or to loosen inhibitions (O'Hara et al., 2014). However, the pharmacological and disinhibitory effects of alcohol, as well as peer pressure to drink more than planned, can lead individuals to experience regrettable health and social outcomes including blackouts, hangovers, unsafe sex and social embarrassment (Bellis & Jones, 2013:NHS, 2018). University students are a group that report experiencing regrets following alcohol consumption: Dunne and Katz (2015) found 66% of their sample engaged in regrettable social behaviours, like drunk dialling; Jones et al. (2020) noted that 79% of their sample reported regretting a hangover, 37% regretted missing work, and 36% regretted smoking cigarettes. Despite experiencing such regrets, university students continue to drink to excess, by regularly engaging with heavy episodic drinking (HED) (see Daveron et al., 2016). The definition of HED varies between nations and between individuals. The WHO (2018) suggests HED is consuming 60 grams of pure alcohol in a single session. Applying this volume to a relatable amount of standard drinks is problematic, as alcohol by volume differs between countries, but also that individuals adopt a more subjective approach, by defining excess drinking as reaching their “tipping point”, i.e., exceeding their tolerance and experiencing a loss of control (Davies et al., 2020). Regardless of which definition is used, existing evidence suggests that regrettable experiences that follow excess consumption do not always deter future consumption. The main aim of this study is to explore students' reports of regrettable experiences that followed excess alcohol consumption to determine how, or if, such experiences inform decisions about future consumption.

Alcohol consumption can be partially explained by focusing on whether or not an individual anticipates experiencing affective reactions to a threat, e.g., regret or shame, which have been shown to influence risk-taking decisions (Loewenstein et al., 2001). The affective reaction regret has been defined as a negative emotion experienced when we imagine our present circumstances would be better if we had acted differently (Zeelenberg & Pieters, 2007).

Regret is positioned to influence risk appraisal by lowering risk propensity (i.e., our willingness to take risks, see Zeelenberg & Pieters, 2004). *Action* regret (i.e., regret from our actions), e.g., regretting a hangover we have experienced due to excess consumption, is expected to have negative relationships with behavioural intentions and behavioural performance. Brewer et al.'s (2016) meta-analysis confirmed that action regret has negative associations with health intentions ($r_+ = -0.45$) and health behaviours ($r_+ = -0.36$). Several studies have confirmed that while action regret is related to alcohol intentions, there is little evidence that action regret predicts excessive drinking behaviour (Ajzen & Sheikh, 2013; Barratt & Cooke, 2018; Cooke et al., 2007; Jones et al., 2020). This suggests the experience of alcohol-related action regret fails to deter future excessive drinking.

Alternatively, theories of health behaviour like the Health Belief Model (Rosenstock, 1974) and Protection Motivation Theory (PMT, Maddux & Rodgers, 1983), posit that risk appraisals inform intentions to perform health behaviours; PMT proposes the risk appraisal variables fear, severity, and susceptibility, inform intentions. Applied to alcohol consumption, fear of hangovers, perceiving hangovers as severe or being susceptible to hangovers, should prompt formation of negative alcohol consumption intentions to avoid hangovers. In contrast, no fear of hangovers, perceiving hangovers as not severe or not believing we are susceptible to hangovers, should prompt formation of positive alcohol consumption intentions. Evidence indicates that risk appraisal is heightened when combining perceptions of susceptibility and severity with affective reactions like regret; appraisal based on both factors results in larger effects on intentions to perform health behaviours and performance of health behaviours (Sheeran, Harris, & Epton, 2013). In sum, while affective reactions like regret are associated with health outcomes, it remains unclear how, or if, affective reactions contribute to risk appraisal when considering excessive drinking.

Qualitative studies provide insights from a social perspective as to why alcohol-related regret fails to deter future drinking. For example, de Visser et al. (2013) report younger adults are motivated to drink to enhance self-image and reputations, but that they also frame negative outcomes, such as suffering hangovers together, as opportunities for social bonding. It is likely that the social gains that can be obtained by drinking in a social setting, e.g. making new friends, or enhancing current relationships, are more salient than subsequent regrets. In addition, because the gains from drinking usually occur before the regrettable experiences it can be difficult to reach the right stage of intoxication to maximise pleasure whilst avoiding or

limiting negative consequences (i.e., “the sweet spot” cf. Graber et al., 2016). Together, such issues may result in drinkers unintentionally drinking to excess.

In addition to exploring how action regrets from excessive drinking are conceived by young adults, there is also a need to explore how young adults make sense of their inaction, which may also be a source of regret. *Inaction* regret, e.g., anticipating or experiencing regret from inaction, e.g., not attending a birthday party because you have to work, has been shown to have positive relationships with behavioural intentions and behavioural performance; Brewer et al.’s (2016) meta-analysis showed inaction regret has positive associations with intentions ($r_+ = 0.52$) and health behaviour ($r_+ = 0.29$). These results suggest that missing out on the opportunity to perform a behaviour can increase the chance of performance in the future.

The experience of regretting missed opportunities to attend social events has been labelled as the Fear of Missing Out (FoMO; Przybylski et al., 2013) and happens when imagining others are having a rewarding experience without us. Higher levels of FoMO are associated with both excessive drinking and experiencing more alcohol-related regrets (Riordan et al., 2015). Nonattendance at drinking events may prompt a need to compensate by drinking excessively.

Qualitative methods are well-suited to the task of exploring both the interplay between action regrets and excessive drinking, and if being unable to attend drinking events prompts inaction regret. Both forms of regret may influence young adults’ future drinking decisions: action regret might discourage excessive drinking in the future, due to the regrettable experiences; inaction regret might encourage attendance at future drinking events. Qualitative methods allow people to express in their own words’ personal experiences, thoughts, and emotions regarding alcohol. The aims of this study are to explore 1) how experiencing action regret, following excessive drinking, informs risks appraisals and future drinking decisions and 2) if experiencing inaction regret following nonattendance at drinking events informs decisions to attend future drinking events. We sought to answer the following research questions:

- 1) Why does experiencing action regret following excessive alcohol consumption fail to deter future excessive alcohol consumption?
- 2) How does experiencing inaction regret following nonattendance at drinking events inform decisions to attend future drinking events?

Method

The consolidated criteria for reporting qualitative research (COREQ: Tong, Sainsbury & Craig 2007) checklist was used to ensure complete and transparent reporting of the study (see appendix A for details).

Participants

The host university ethics committee approved the study. Study inclusion criteria were: (1) aged 18 or older; (2) score between 8 and 19 on the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De la Fuente & Grant, 1993) indicating drinking at a hazardous (8-15) or harmful (16-19) level consistent with experience of excessive drinking.

Thirteen university students (69% female, aged 18 to 20, AUDIT scores ranged from 8-19) were recruited from a university in the Northwest of England to take part in one of three focus groups lasting approximately 30 minutes. All participants were from the same university course and knew each other from attending lectures and/or seminars. Participants all identified as being of white ethnicity. Participants who signed up to the study were emailed an information sheet outlining the research and were advised that the study formed part of the first author's PhD research on young people and alcohol-related regrets. Table 1 provides details about group compositions. These were not intentional but reflected the participants who signed up for the study and attended each focus group; one female and one male signed up for but did not attend the third focus group.

Table 3.1: Group Compositions and Characteristics

Group 1	Group 2	Group 3
Elaine – 19, Female, White	Gemma – 19, Female, white	John – 19, Male, white
Helen – 19, Female, White	Hope – 18, Female, white	Neil – 19, Male, white
Lisa – 19, Female, White	Louise – 18, Female, white	Tim – 19, Male, white
Mary – 20, Female, White	Molly – 19, Female, white	
Steve – 19, Male, White	Sarah – 19, Female, white	

Data Collection

After reading the participant information sheet, all participants provided informed consent prior to the focus group discussion. Groups were facilitated in the host university's psychology department between February and March 2019. A semi-structured schedule was created to facilitate discussion. The schedule contained questions and probes to encourage participants to contemplate and express their experiences, thoughts and emotions. For example, one question regarding alcohol-related experiences was, "*can you tell me about a recent experience where you were drinking alcohol?*". This was followed by probes such as, "*why do you think you reacted that way?*" or "*how did it feel to experience that?*". To ensure all participants provided experiential data, each participant was required to describe their first experience of drinking alcohol, share a narrative of a recent social drinking event and a time when they missed a similar event. During group interactions, participants who remained quiet were asked by the facilitator about their thoughts on the issue or if they could share any similar experiences.

The first author facilitated all focus groups, which were recorded using a digital recorder and transcribed verbatim. To ensure participant anonymity, participants were pseudonymised. After the initial focus group, the transcript and field notes were read and discussed between the first and last authors, noting which questions needed altering or followed up further. The remaining focus groups were run using slight variations of the original schedule e.g., questions were altered to focus specifically on certain experiences such as students' first few weeks at university. Participants were informed that they could request a copy of the transcript of their session and the themes generated from the analysis.

Analysis

Interpretative phenomenological analysis (IPA) is an experiential qualitative technique that aims to provide insights into individuals' lived experiences, and is ideographic and eidetic in nature (Smith, 2004). The ideographic nature of IPA presents a challenge for adapting this methodology for focus groups, i.e., how can individualistic phenomenological accounts be obtained from a group setting? The accounts obtained in a group setting are likely to be influenced not only by the discussion topics and the researcher's reactions, but also by the dynamics of the interactions between the participants. Smith (2004) suggests when attempting to apply this experiential technique to more complex social interactions, such as focus groups, consideration must be made for the complexities that arise, noting that analysis

will have to be approached twice: one for assessing the group dynamics and shared accounts and a second for ideographic accounts.

IPA was adapted to suit the medium of focus groups using the protocol outlined by Palmer, Larkin, de Visser and Fadden (2010). The analysis was conducted by the first author. Step one entailed the repeated reading of the transcripts and noting any preliminary thoughts from excerpts of interest, along with noting individual participants' narratives and shared narratives created from group interactions. Step two involved reading the notes and looking for emergent themes based on the characteristics of the excerpts and the authors' interpretations of them. Step three consisted of assessing the emergent themes for conceptual similarities and clustering them together. Step four entailed a re-reading of the transcripts to explore different interactional and contextual components e.g., how the group setting influenced the way in which perceptions were shared and the nature of the group narratives, paying close attention to the language used to construct the narratives. Step five involved a cross analysis whereby the themes generated from each group were compared. Similar themes were grouped together into super-ordinate themes, whilst individual themes from the separate groups were retained as distinct themes. The final step resulted in a table of themes being produced. The table detailed the themes, with line numbers from the transcripts, which served as a link to the data excerpts.

Results

Three super-ordinate themes were identified: "It's not something I would have done sober", "Attitudes towards action regret" and "The Fear of Missing Out (FoMO)".

It's not something I would have done sober

In this theme, participants discussed how their alcohol consumption during drinking events resulted in them engaging in risky behaviours. Sarah discussed an incident that led to her unintentionally ingesting an illicit substance:

Sarah: "I had a night like, were I got spiked in the club, which was like bad"

Louise: "Oh god"

Sarah: "I was quite excited on that night, we were in [REDACTED] (night club) and I was like taking drinks from the side that people had left, and I was like free drinks yeah! Someone had put something in their drink and left it at the side and I was like shaking and my eyes were like., hmm., I don't know, I can't really remember much but apparently I was in a state"

Gemma: "You do not take random drinks!"

Sarah: "Yea I have not done it since, it was a bad idea"

Facilitator: "Ok, to what extent would you say you regretted doing it?"

"Oh yea totally! I felt really stupid for doing it" – Sarah (Group 2)

Sarah freely admits to action regret from taking unattended drinks during a night out. However, when reflecting on her actions, the decision to consume unattended drinks was not based on risk appraisals—concerns about the severity of ingesting a spiked drink, or how susceptible she would be to being a victim of crime after consuming a spiked drink—but was driven by her mood ("quite excited") at the time, and by the expectancy that consuming more alcohol might further enhance her mood. Additionally, Sarah rationalises her behaviour as driven by financial reasons, she saves money by taking other peoples' drinks and celebrates saving money ("...free drinks, yeah!"), which reflects the attitudes of students who live on a limited budget. Based on Sarah's account the financial and social gains from her actions were salient, the potential health and social losses were not.

Sarah's expression of regret over the incident is a reaction to the judgement of her focus group peers - Louise reacts with shock and disbelief while Gemma reprimands her. The immediacy of these reactions suggests both possess preconceived notions about the risks of consuming unattended drinks, e.g., safety, hygiene and being caught stealing. From Gemma's perspective, Sarah put herself at unnecessary risk, which could have led to her experiencing regrettable consequences. Sarah suggests she has learnt from the incident by stating that she has not repeated the behaviour, implying that she experienced action regret after the event, which deterred her from taking unattended drinks during future drinking events. Nonetheless, this admission may have been impacted by social desirability, in that Sarah wants to project a favourable image of herself to other members of the group. Thus, future decisions about whether or not to consume unattended drinks may be driven more by worries about damaging her reputation through negative social judgement than action regret over taking unattended

drinks, or, wanting to drink excessively, which may have been the aim of taking the drinks. The social costs of her action may be viewed as more significant than her experience of action regret, or other health, or personal safety, costs.

John and Tim also shared their experiences of extreme consequences following excessive drinking:

Facilitator: "Can anyone share some of the negative things that have happened to them as a result of their drinking?"

John: "I wouldn't call it a proper regret, but when I was on holiday with my mates., it was like the first night, so obviously I couldn't remember loads of it and then I woke up the next morning with a tattoo on my bum of a footballer's name"

(Neil and Tim laugh loudly at John's account)

Facilitator: "Which footballer?"

John: "Aguero, so I wouldn't say it was a regret cause I do love him but it's not something I would of done I was sober (laughs)!"

Facilitator: "Anything to add Tim?"

Tim: I think the biggest regret I had was when I went to France for a day trip and then it turned into a two day trip because I ended up in hospital for drinking too much., the last thing I remember was like just waiting outside the harbour with my friends and I thought I'll have a little nap on the grass and then I woke up in hospital the next morning surrounded by French people and I was like oh I'm not home yet! (laughs)

Facilitator: "Do you remember how you felt when you woke up in the French hospital"?

Tim: "It was very weird because I thought I was at home, so like I woke and I had like a nappy on! (laughs) and I was like oh ok, not fun"

(Neil and John laugh loudly at Tim's admission)

"but then it was ok cos I can speak French": Tim (Group 3)

John and Tim recall incidents that happened to them whilst drinking excessively on a lads' holiday: John awoke with an unsolicited tattoo and Tim ended up in hospital with alcohol

poisoning. These serious consequences resulted from their decision to engage in excessive drinking while on holiday. Their decision to drink reflects normative beliefs regarding the culture of excessive drinking for young men which may exert a greater influence on decisions to drink than risk appraisal based on weighing up the pros (having a good time) and cons of drinking (getting a tattoo, being hospitalised). Both John and Tim downplay the severity of what happened to them following engaging in excessive drinking; John claims that he does not really regret his tattoo, while Tim states that because he can speak French the regret at being hospitalised for alcohol poisoning is lessened. In contrast to Tim, John does note he ended up with his tattoo only because he was inebriated, suggesting he may possess lingering doubts over his actions. Both men's ambivalence towards their regrettable experiences suggests these experiences may not lead to action regret and are unlikely to encourage them to adopt "low-risk" drinking patterns in the future. Their ambivalence is reinforced by the reaction of the other young men present in the focus group when John and Tim recall their experiences: they react by laughing at their accounts, implying that such incidents are to be expected and are an accepted part of drinking culture for young men. This is in stark contrast to how Sarah's female peers reacted when she disclosed her regrettable experience. This indicates that it is still more socially acceptable for young men than young women to suffer the consequences of excessive drinking because when men report doing something they regret it merits laughter, whereas when women do the same, it leads to shaming. This may make young women more prone to report experiencing regret from their actions, i.e., young men's regrettable incidents are humorous tales, whereas young women's incidents are tales of caution, and hence this may heighten young women's risk perception and influence their future consumption to a greater degree.

Attitudes towards action regret

In this theme, participants discussed their attitudes towards their regrettable behaviour. In the first extract John discusses how his attitudes towards what happened after excessive drinking changed after experiencing injury following alcohol-related violence.

"Yea, since then I don't think I've been that drunk cause, I see some people who do it every time they go out, they get to that level, now I know I'm prone, like prone to do stuff like that when I'm that drunk, when I can't remember when I do lose control then

it's not good, especially for me cause the amount of concussions I've had, that makes me think a lot cause I can't be getting in like fights or anything"- John (Group 3)

John highlights how his risk appraisals, particularly his sense of being susceptible to getting into fights after excessive drinking, “...I know I'm prone, like prone to do stuff like that...”, have increased due to his past experience of concussions. These experiences were transformative for John in that it served as a basis for him reflecting on the interplay between regret and excessive drinking. This appears to be an example of action regret informing decisions about future drinking and specifically how drunk John intends to get. This new, lower, level of drunkenness is articulated when John contrasts his peers' drinking behaviour, in that “every time they go out, they get to that level” with his current drinking; their excessive drinking is used by John as a heuristic for his revised attitudes.

Neil discussed possessing a different attitude towards his regrettable experiences:

“I have felt serious embarrassment, obviously you have these embarrassing moments when you can't remember like the stuff you do but I think you just laugh it off in the end. I don't think there is any point dwelling on it and getting down and too embarrassed about what has happened. Just laugh it off, see it as another stupid fresher doing silly things and you just laugh it off, cause it's quite funny some of the things that happen but yea I guess I just laugh it off and move on instead of spending time getting embarrassed by it” – Neil (Group3)

Like John, Neil also reports undergoing a transformative process when reflecting on his excessive drinking; he engages in a process of acceptance, in which he transforms his negative experience of feeling embarrassed into a positive experience of amusement. While, Neil alludes to reframing his behaviour in a positive light, he repeatedly asserts that he dismisses his actions by laughing them off. This reveals that Neil may be in denial about how he feels and may still possess action regret with regard to his embarrassing behaviour. The discord exhibited by Neil may be the result of his regrettable behaviours acting in opposition to his beliefs for excessive drinking, i.e., the potential for damaging his reputation. This implies the attitude he adopts towards his action regret enables him to continue to engage in excessive drinking while maintaining a positive outlook on how he views himself. This is further highlighted when Neil likens his behaviour to the stereotype of the excessive drinking student. By reframing his regrettable experiences as something that is expected of him as a

university student, he can rationalise his behaviour as acting in line with others' expectations for him, distancing himself from responsibility for his actions.

Hope also discussed her attitude towards performing regrettable acts:

“Going out and embarrassing yourself or like, I don't know doing stuff that you wouldn't usually do when you were sober, that's not exactly negative, that's just a symptom of drinking alcohol, like that's what people do” - Hope (Group 2)

Hope's attitudes toward her regrettable behaviour enable her to rationalise excessive drinking and subsequent acts. She reports attitudes which lessen her liability for her actions in several ways. First, she contrasts her drunken behaviour with her sober behaviour, assessing her actions are due to the effects of alcohol. Second, she believes that it is expected of her to engage in regrettable acts whilst drunk and invokes a medical metaphor, framing these acts as a *symptom* of drinking alcohol. Doing this allows her to account for these actions while simultaneously distancing herself from responsibility, i.e., would a person suffering from disease be held accountable for their condition? Hope's attitudes towards action regrets highlight how her experiences fail to heighten her risk appraisal. By removing her sense of personal liability, Hope eliminates the fundamental element of regret, self-blame. Freeing herself from recrimination enables Hope to continue to engage with excessive consumption and the embarrassing acts that follow.

The Fear of Missing Out (FoMO)

Participants were asked if they had ever experienced *inaction* regret following nonattendance at drinking events. Group one participants discussed their experiences:

Helen: “I guess it's cause you don't know, like you don't know what you are missing out on cause you're not there. So you can big it up in your head as much as you want, you can be like that could have been the best night ever”

Steve: “Yea that could be like the biggest and best night ever”

Lisa: “Yea”

Helen: “Or you think like, you could of made another friend or like you could of done this or that and then it's like you said (indicates Lisa) you see the pictures the morning after and you're like I wish I was in them”

Lisa: "Or like the inside jokes, when they are like.."

(Collective murmurs of agreement)

Steve: "If there's an inside joke, you're just like stood there and totally missing out"

Elaine: "Yea you just have to fake laugh, and you just have to hope, no-one says you don't know that joke, like why are you laughing"

Mary: "It's like you can't reference it either, cause you weren't there"

Helen: "So then like sometimes I'm convinced to go out, like through my own fear of missing out"

Lisa: "Same here"

Steve: "Me too"

Helen's account provides a description of how her inaction regret or Fear of Missing Out (FoMO) manifests itself when she checks social media. Helen engages in a process of magnification, in which she inflates the subjective value of missed nights out, rather than inflating the value of achieving other goals like completing assignments or paid work. The posts remind her of what she misses out on providing an idealised version of excessive drinking, all of the fun is shown in the posts, but none of the aftermath is experienced *because* Helen remained sober. All the social gains, none of the losses. This perception may lead to risk appraisals that lessen the severity of experiencing these consequences, and because social media provides an excellent means to stage-manage how events unfold, where positive experiences are posted and negative experiences are hidden, perhaps also reducing risk appraisals about susceptibility to these negative outcomes. If you do not see people being sick or unconscious you might not believe these outcomes occur. Social media also shines a light on social losses that can occur from nonattendance. Helen reveals that by not going out she misses out on obtaining several desirable outcomes: hedonic pleasure, social gains and satisfying novel experiences. Through nonattendance at drinking events, Helen rues missing the opportunity to obtain these outcomes, "*...you see the pictures the morning after and you're like I wish I was in them*".

The other members in group one elaborate the narrative and provide an example of how missing nights can result in experiencing a sense of social isolation, an experience described as aversive. Elaine even suggests playing along with her peers' narrative, even though she did

not attend the event, to avoid feeling isolated. This highlights that one-way university students experience inaction regret is through FoMO, following discussion of shared experiences gained during a drinking event. At the end of the extract, participants provide a striking statement about how keen they are to avoid FoMO; they would rather go out and risk experiencing action regret, by drinking excessively, than stay at home and suffer FoMO.

Neil from group three discussed his experience of missing nights out:

“I think this happened a lot in first term, when you’re new and you’re trying to make an impression and you don’t want to be seen as the boring one who doesn’t go out, so even when I was feeling rough I would always think to myself, oh I can’t not go out, oh what will they think about me, especially in this like rugby, laddish culture, will they like me, will I fit in, will they lose respect for me if I don’t go out. So yea even if it was against how I felt, against my instincts I always had to go out, I felt like it was needed” – Neil (Group 3)

Neil’s account reveals how his FoMO directly impacts his risk appraisals, but these are centred on appraising risks about his social status rather than his health. His FoMO prompts him to attend future drinking events because he fears missing out on the social gains, he perceives being able to obtain from attending these events. His experience is driven by a desire to avoid both the negative emotions associated with missing out on social activities and a loss of social face, if he fails to conform to the expectations of the “*rugby, laddish culture*”. These feelings are so intense that even when feeling ill, Neil convinced himself to attend the events, suggesting maintaining social relationships is perceived to be more important than maintaining individual health. This highlights how FoMO experienced from nonattendance at drinking events directly impacts risk appraisals for attending future drinking events. The impact of Neil’s FoMO on his risk appraisal is also influenced by his self-identity and the group identity he aspires to construct. Neil assesses the risk of not conforming to the group norms around drinking as being worse than suffering the consequences of excessive drinking.

In this extract, Sarah and Hope discuss how their feelings of FoMO diminished over time:

Sarah: “I think it was more important in first term, when you don’t know people and like the bonds were more crucial to like establish at first, whereas now (semester two), we’re all kind of like comfortable around each other, like we’re all good friends, so if you miss a couple of nights then it’s not the end of the world, like you’re still going to be mates, you got that foundation”

Hope: "I feel like in the first semester, cause like you said you don't really know anyone and you're trying to settle down into this like group and I think like first you are sort of grasping every opportunity to go out and meet new people, whereas now you've got your friends and if you don't go out with them it doesn't really matter cause you'll still be friends with them at the end of the day"

Sarah and Hope's discourse suggests that FoMO's effects on risk appraisals about attending drinking events are most pronounced when social relationships are in their infancy; in the developmental stages of relationships FoMO is heightened, with individuals acting to avoid the potential risks of missing out: "...grasping every opportunity to go out". As time passes, and relationships develop, participants establish circles in which they feel valued and will not be judged negatively for missing nights out, reducing their experience of FoMO.

Gemma and Molly revealed an alternative view on their FoMO:

Facilitator: "What do you think would be the consequences of missing one of those big nights out with your friends?"

Gemma: "I think if you miss a lot of them, they just naturally get closer and you're not as close naturally"

Molly: "I think what you just said is true, one of our flat mates only comes out like once every two or three months and we're like really close and she's kind of left a bit to the side, like she's not involved as much and I feel like kind of bad for her, cause that means she doesn't get invited to like other things as well, cause we automatically assume that she won't want to come, so she ends up like really left out"

Gemma: "That's happened in my flat as well, there's a girl and she's always like oh yea I'll come out with you tonight and then she cancels every single time. So now obviously we stopped asking her"

Gemma and Molly's discussion highlights the knock-on effect of nonattendance at drinking events on their risk appraisal; they perceive that missing nights presents both social loss, in terms of failing to accrue social gains, but also increases the risk of missing out on future social gains via exclusion from other social activities. Gemma and Molly express fear at the possibility of being excluded which provides them with a strong motive for attending drinking events. This highlights how the anticipation of inaction regret influences risk appraisal and informs the decision to attend drinking events. While Sarah and Hope suggest

that the impact of FoMO on risk appraisal diminishes over time, Gemma and Molly's account suggests while FoMO may diminish it does not completely fade away due to the perceived need to maintain social ties.

Discussion

This study used qualitative methods to explore why experiencing regret following excessive drinking (action regret) fails to deter future excessive consumption, and how regret experienced following nonattendance at drinking events (inaction regret) informs decisions about alcohol consumption during attendance at future drinking events.

In most participants accounts of their experiences of alcohol-related action regret, such experiences generally failed to inform their risk appraisals, or attitudes towards excessive drinking regarding future drinking events. Therefore, experiencing action regret does not appear to result in changes to psychological variables outlined in models of health behaviour like the Health Belief Model or Protection Motivation Theory; action regret was rarely linked to fear, perceiving increased severity of negative health consequences or made participants view themselves as susceptible to these consequences. One participant, Sarah, reported that action regret led her to reflect on how she acted when excessive drinking. Her actions, taking unattended drinks, posed a direct threat to her personal safety and prompted social censure over behaviour from other members of her group. However, if it takes experiencing serious regrets to prompt reflection on excessive drinking then it is understandable why most of the time action regret rarely informs behaviour because experience of serious regrets is, thankfully, rare. Jones et al. (2020) report a much lower prevalence of serious regrets than other types of regret, e.g., experiencing a hangover or saying something embarrassing. It should also be acknowledged that we cannot be sure that Sarah's reaction was not an attempt to maintain her social standing with the other focus group members.

Existing studies can help us to explain our finding that action regret did not deter excessive drinking. Griffin et al. (2018) report that some UK university students reframe experiencing negative consequences like hangovers, as positive experiences (collective suffering) that strengthens social bonds and reinforce identification with group norms. A study by Johnston and White (2003) shows the importance of identification with group norms in terms of intentions to engage in excessive drinking. In a sample of Australian university students, they

found that the relationship between the group norm to drink excessively and intentions to drink excessively was moderated by how much students identified with the group norm: Students who identified with the group norm displayed a linear relationship between norms and intentions such that those who viewed the norm more favourably reported more positive intentions. By contrast, among students who did not identify with the group norm, there was no relationship between norms and intentions. Whether or not we identify with a group norm can affect our planning regarding future drinking.

Such findings imply decisions to drink excessively are not based on a risk appraisals or action regret but may instead focus on the social gains (reinforcing friendships) and losses (embarrassing oneself) of attending drinking events. Cox and Klinger's (1988) incentive motivation model would frame this process as the incentives (social gains) to drink excessively outweigh the incentives not to drink excessively (financial or health gains). Moreover, some of our participants expressed that regrettable acts are what is expected of their social group, and by performing acts that are expected of them they can remove the self-blame associated with experiencing regret, linking such actions to the development of their group identity as discussed by Griffin et al. (2018). Research has shown that regrettable experiences are a normalised part of a night out for UK university students (Davies et al., 2017). Upon entering university, students rapidly gain first-hand experience that social events typically involve excessive drinking and the embarrassing incidents that follow come to be seen as both expected and acceptable (Davies et al., 2017).

We found evidence of gender differences in how female and male students responded to reports of engaging in regrettable behaviours. Our female participant who admitted to taking unattended drinks was immediately held accountable by her female peers, who perceived her actions as extremely risky. This is contrasted with how our male participants responded to an account of alcohol poisoning, which is potentially fatal, by laughing. This double standard can be seen as reflecting gendered norms for excessive drinking, where drinking to excess, the risky behaviours that follow, are consistent with masculinity but not femininity (Montemurro & McClure, 2005). de Visser and McDonnell (2012) argue that women's alcohol consumption and behaviour are more harshly judged than men, exactly what we found in our focus groups. This notion may help explain why female students report experiencing more alcohol-related regrets than male students (Orchowski, Mastroleo & Borsari, 2012).

We also found that male participants in our study downplayed the severity of their actions. Findings from de Visser and Smith (2007) suggest young men exhibit ambivalence towards the negative outcomes of excessive drinking and that they rationalise this by framing the consequences as the trade-off needed to have a good time. In addition, young men's experiences whilst on holiday highlight potential circumstances where the normal cues to drinking are not present, resulting in greater consumption than normal: evidence indicates younger adults tend to increase their alcohol consumption and engagement with risky behaviours whilst abroad (Hesse et al., 2008).

Turning to discuss how inaction regret following nonattendance at drinking events can inform future drinking decisions, our participants reported a clear fear of missing out (FoMO), where they assigned great importance to the social losses associated with nonattendance. Returning to Cox and Klinger's (1988) incentive motivation model, the incentives to attend drinking events were perceived to be greater than the incentives to not attend; participants did not mention the academic (e.g., completing an assignment), financial, (e.g., earning money), health (e.g., not having a hangover) or social (e.g., not having to apologise for an argument) gains that follow *nonattendance*; such gains were not salient among our participants. While it is possible that if we had asked more directly about these issues, participants would have recalled experiencing such gains, it is also possible that such gains do not occur to young adult drinkers.

Participants did report that their FoMO has the potential to drive attendance at future drinking events, particularly during the early stages of friendship formation but also in coping with FoMO, young adults report attending more social drinking events to compensate for missing out (Crawford et al., Unpublished). Participants' accounts revealed alcohol-related FoMO is fundamentally social in nature, which is supported by existing literature (Przybylski et al., 2013). FoMO may impact decisions to drink as it is driven by a need to avoid social losses, like isolation. This suggests a possible mechanism linking FoMO with experiencing regrettable consequences from excessive drinking: fulfilling the need for social gains results in excessive consumption, to achieve social gains, but excessive drinking can lead to regrettable acts. These findings add to the literature on health-risk behaviour, which suggest inaction regret predicts behavioural outcomes (Richard, de Vries & van der Pligt 1996; Brewer et al. 2016)

In discussing how the experience of FoMO impacted their risk appraisals, participants revealed that social media provides a vicarious experience of the missed event. By viewing posts, participants inflated their imagined sense of enjoyment from attending the event, imagining the fun their friends were having and not experiencing the consequences. Evidence from Lyons et al. (2016) highlights that positive alcohol-related images and posts are shared on social media. Furthermore, the rosy-view effect (Mitchell et al., 1997), a cognitive bias that means people's recollection of events are much more positive than their actual experience, suggests that when recalling a previous event or a night out, individuals tend to focus on the positive aspects over the negative, and hence display this bias when assessing the subjective worth of an experience. This can explain why our participants experiences of FoMO impacted their decisions to attend future social drinking events.

Future studies are needed to address questions that flow from the present study such as 'How do young adults process and cope with experiencing FoMO?', 'Does FoMO decrease over time?', and 'What mechanisms link FoMO to regrettable behaviours?'. To our knowledge this is the first study to employ qualitative methods to explore the interplay between regret and excessive drinking, with a particular strength being our novel findings about FoMO following nonattendance at drinking events. Nonetheless there are limitations with this study. This study only addresses individual and social influences on alcohol consumption. It is beyond the scope of this article to account for all the influences on consumption, such as cultural, environmental or policy factors, and how they interact to shape alcohol use. Due to the facilitator of the focus groups being male, this may have encouraged the male participants to share their experiences. Alternatively, having a male facilitator may have made our female participants less inclined to discuss sensitive issues. Due to the data being collected retrospectively, it was not possible to assess how students anticipate experiencing regret to allow us to compare results with quantitative work on this topic (Davies & Joshi, 2018). A further limitation is the homogeneity of the participants in terms of their shared white ethnicity. Our results cannot be generalised to other ethnic groups until future research studies have been conducted with more ethnically diverse samples.

In conclusion, this study provides an account of why experiencing action regret following excessive drinking fails to deter future excessive drinking behaviour and how experiencing inaction regret (FoMO) following nonattendance at drinking events can influence future drinking decisions. Extreme risky behaviours were reported and a potential gender difference in the perception of risk for these behaviours may exist. Attitudes towards action regret

influences risk appraisals and subsequent drinking. Importantly, the study also revealed that FoMO experienced from not drinking socially, impacts risk appraisal by lowering the perception of risk from drinking and heightens the risk of missing out on perceived benefits. For these reasons, FoMO may be an important driver of excessive drinking amongst university students, who trade-off the negative consequences of excessive drinking in exchange for the gain of maintaining positive social relationships. Understanding these experiences allows us to further understand excessive drinking among university students.

Chapter Summary

This chapter contributed to the thesis aim of exploring why regret fails to inform future drinking; regrettable incidents were perceived as common-place and an expected part of an evening, however the experience of serious regrets did impact risk perceptions of heavy drinking. Secondly the chapter also contributed to a further aim of exploring if young adults experience inaction regret from missing opportunities to consume alcohol, in the form of FoMO. Findings highlight that FoMO is experienced from missing these opportunities; the experience of alcohol-related regrets was preferable to experiencing the FoMO from non-attendance at drinking events, suggesting FoMO may provide a form of aversive motivation to drink in the future. Based on this I further sought to explore the lived experiences of FoMO.

Chapter Four

“You try to make it better by drinking more” - An Interpretative Phenomenological Analysis of the Fear of Missing Out

This chapter presents a qualitative study that aimed to further explore lived experiences of FoMO, consequent of missing alcohol-related social events. I sought to explore how young adults process experiences of FoMO but also if they engage with coping behaviours. I designed the interview schedule, which Richard Cooke approved. The interviews, analysis and write-up were conducted by myself; feedback on the manuscript was provided by Richard Cooke, Andrew Jones and Abigail Rose.

Abstract

Background: Consuming and abstaining from alcohol impacts young adults' social lives and influences beliefs and thoughts about alcohol. Research is yet to fully explore what happens when young adults are unable to engage with alcohol consumption due to other commitments. Missing opportunities to drink socially gives rise to a sense of missing rewarding experiences, known as 'Fear of Missing Out (FoMO)'. This study aimed to explore experiences of FoMO.

Design: Qualitative study using individual-case interviews.

Method: Six university students (50% female), aged 18 to 24 participated in single case interviews. Data was analysed using Interpretative Phenomenological Analysis (IPA). IPA is a technique that seeks to illuminate lived experiences.

Results: The analysis generated three superordinate themes: "The need to belong", "I would be anxious" and "Balancing the scales". Participants perceived social drinking enabled the creation of shared memories, which reinforce group identities and increased a sense of belonging. Missing opportunities to drink socially resulted in feelings of anxiety and worry, specifically regarding their positions within social groups. Participants discussed how they redressed the negative affect resulting from FoMO, by engaging with coping behaviours.

Conclusion: Attending social drinking events enables identification with peers via the creation and sharing of memories, which are used to affirm position within social groups. Conversely, non-attendance at social drinking events fosters negative emotional states like anxiety and worry. To manage these negative states, adaptive and maladaptive tactics are used, such as cognitive reappraisal and vicariously experiencing missed events.

Introduction

Alcohol consumption is a prevalent behaviour in the UK with 57% of adults consuming alcohol weekly and 24% of those exceed the government's low-risk drinking guideline of 14 units of alcohol per week (1 unit = 8g of pure alcohol; NHS digital, 2020). Young adults (aged 18 to 30) tend to consume alcohol in a hazardous fashion (i.e., consuming copious amounts in a single session), that makes it likely they will exceed the guidelines and their subjective tolerance of alcohol (Conroy & Measham, 2019). Drinking alcohol in this way increases the likelihood of experiencing a loss of control (Davies et al., 2020) and a range of negative short-term health consequences: blackouts, hangovers, violent assault, unsafe sex. Despite there being an extensive literature testing psychological predictors of young adults' drinking behaviour (Cooke & Crawford, 2021), there is relatively little research exploring why young adults exceed drinking guidelines. The aim of the present paper is to address this question.

While young adults report experiencing negative short-term health consequences (Jones et al., 2020; Rehm, et al., 2009; Wetherill & Fromme, 2016) following hazardous drinking, there is little evidence that experiencing such consequences impacts subsequent consumption. For example, Jones et al. (2020) reported that experiencing negative consequences did not lead to reduced consumption. In addition, qualitative studies indicate that young adults perceive the negative consequences of consumption as commonplace, an expected part of a night out, or the price paid for a good time (Crawford et al., 2020; Davies et al., 2018; de Visser & Smith, 2007). As consumption is an inherently social behaviour performed to achieve social gains (e.g., bonding and having fun with peers, de Visser, 2021) it is likely that social gains are more salient than the health losses experienced after exceeding drinking guidelines (Crawford et al., 2020; Rudolfsdottir & Morgan, 2009).

Consuming alcohol is a social practice that is, arguably expected of UK young adults; alcohol saturates young adults' social lives and is invariably a central part of most social gatherings they attend (Crawford et al., 2020; Davies et al., 2018; de Visser et al., 2013; Rudolfsdottir & Morgan, 2009). Drinking with others helps to establish shared identities and social groups (Griffin et al., 2018; Guise & Gill, 2007). The role of alcohol in creating bonds and identities is two-fold. First, consuming alcohol provides a positive social function by enabling

individuals to lower inhibitions and enhance the social bonding process via increased trust, intimacy, compassion, sharing and support (de Visser et al., 2013; Dresler & Anderson, 2017; Foster & Spencer, 2013). Second, the acts associated with consumption provide the social capital needed to forge and strengthen social bonds and identities, such as buying rounds of drinks, sharing stories, engaging in drinking rituals (e.g., drinking games), and caring for inebriated peers (de Visser et al., 2013; Dresler & Anderson, 2017). In particular, sharing drinking stories plays a central role in young adults' social lives; they provide a sense of mutual collective experience that is part of having fun and creates help to develop narratives that bind groups together (de Visser et al., 2013; Dresler & Anderson, 2017; Tutenges & Rod, 2009).

Even the aftermath of exceeding drinking guidelines provides further opportunities to strengthen bonds; for example, the physical and emotional discomfort of a hangover is often reframed as a positive experience when shared with friends, as it offers the opportunity to continue with group socialising and enables peers to share the symptoms together (Dresler & Anderson, 2017; Fjær, 2012,2015; Griffin et al., 2018). Reliving these experiences offer young adults the opportunity to interpret, evaluate and make sense of the previous night's activities. This is important as it enables drunken performances that could be deemed as regrettable or shameful to be collectively reconstructed and celebrated using humour, attenuating negative emotions that might be expected to discourage future drinking.

Young adults' construction of identity is closely interwoven with an expectation that they will drink, and they perceive a close connection between drinking, intoxication and being incorporated in peer and friendship groups (Cocker et al., 2018; Hepworth et al., 2016; Tutenges & Sandberg, 2013). This is further highlighted when young adults attempt to abstain or cut back from drinking alcohol. When abstaining from alcohol consumption young adults perceive a worry of being marginalised and/or ostracised from their peer groups (Bartram et al., 2017; Conroy & de Visser, 2014; Frank et al., 2020). As a result they will often engage in a set of strategies to protect their social position/status and minimise the cost of their abstinence; for example creating narratives where non-drinking is socially acceptable, such as being a designated driver, having medical reasons, holding religious beliefs, or engaging in sports (Bartram et al., 2017; Conroy & de Visser, 2014; Frank et al., 2020). These findings highlight the pervasive nature of alcohol consumption in the social lives of young adults; they are acutely aware of not only the social gains but the potential for social losses from periods of abstinence. This suggests that engaging with alcohol consumption is

imperative for maintaining and protecting social standing, but also young adults need to account for and defend their abstinence.

A limitation of existing research studies investigating the role alcohol consumption plays in young adults' social worlds is that they have either focused on engaging with, or abstaining from consumption. Research has yet to fully explore how missing out on opportunities for social drinking influences young adults' social worlds, for example missing out on a party or night out with friends due to study or work commitments. Young adults often report a sense of missing out when they are unable to attend social activities, perceiving others are having rewarding experiences without them, this sense of missing out is referred to as the Fear of Missing Out (FoMO) (Przybylski et al., 2013). Crawford et al. (2020) noted that when young adults missed out on drinking events, they often report experiencing FoMO as a result - they perceive that missing drinking events means they are missing out on social gains, like creating or maintaining friendships. In addition, Crawford et al. (2020) report that young adults would *rather* experience the negative consequences of drinking too much, than experience the FoMO that follows missing out; the subjective, psychological experience was described as more aversive than the physical consequences of exceeding drinking guidelines.

Extant literature suggests experiencing FoMO from missing out on social drinking events, may influence young adults' perceptions about alcohol consumption. Nonetheless it remains unclear how this experience of missing out influences perceptions, but also if this experience results in performance of coping behaviours or behaviours to protect peer group status and/or maintain social standing. Considering how alcohol consumption is deemed as a social imperative for young adults, it is important to explore how this potential driver of alcohol consumption influences alcohol-related perceptions. The current study aims to answer the following questions using qualitative methods:

- How do young adults make sense of missing opportunities to drink socially?
- How do young adults report coping with the experience of FoMO?
- Does the experience of FoMO influence young adults' perception of their social worlds?

Method

Participants

The host university ethics committee approved the study. Six adults (three female, three male, aged 18 to 24; see Table 1 for further details) were recruited from a university in North West England, between October and December 2019, to take part in an interview. Participants received course credit for participating. Inclusion criteria were: (1) aged 18+; (2) score between 8 and 19 on the Alcohol Use Disorders Identification Test (AUDIT, Saunders et al., 1993), indicating drinking at hazardous (8-15) or harmful (16-19) levels. Individuals scoring on these ranges are more likely to exceed safe drinking guidelines. Exclusion criteria was scoring 20+ on the AUDIT, which indicates possible dependence. AUDIT scores ranged from 11 to 18. Participant uptake was on a first come, first serve basis. Participants were pseudonymised to ensure anonymity.

Table 4.1: Participant Characteristics and AUDIT scores

Participant	Age and Ethnicity	AUDIT Score
Lisa	19, white	18
Ashley	20, white	11
Susan	19, white	12
Mark	24, white	15
David	20, white	14
Ryan	19, white	18

Data Collection

Prior to the interviews, participants read an information sheet and provided informed consent. They were advised the study was interested in exploring their experiences of social drinking. A semi-structured schedule was used to facilitate the interviews, designed to encourage participants to contemplate and express their personal experiences, for example one question asked, “Can you tell me about a time you may have missed a night out with friends?”. This was followed by probes such as: “How did it feel to experience that?” or “Why do you think you reacted that way?”. The lead author facilitated the interviews, lasting around 30 minutes. They were recorded using a digital recorder and transcribed verbatim.

Analysis

The data was analysed using Interpretative Phenomenological Analysis (IPA), which aims to provide an in-depth account of personal lived experiences (Smith, 2004), and hence why it was deemed as appropriate for the analysis compared to other techniques. The procedure for conducting IPA is flexible, in that it can be adapted to suit the needs of specific study aims (Smith, 2004). The analysis followed several steps: Step one consisted of repeated reading of the transcripts and noting any excerpts or comments of interest. Step two involved transforming the initial notes into emergent themes, taking careful consideration to maintain the connection between the participants' words and the analyst's interpretations. Step three consisted of assessing the emergent themes for conceptual similarities and clustering them together. The theme clusters were then given a descriptive label, indicating the conceptual sentiment of each theme cluster. The emergent themes were closely checked to ensure they remained grounded in the participants' accounts. The final step of the analysis involved a cross-analysis, whereby the themes generated from each participant were compared. Similar themes were grouped together to form super-ordinate themes; individual themes were retained as distinct themes. During this final step, a table of themes was created. The table highlighted the structure of the superordinate themes and distinct themes, along with data excerpts and line numbers from the transcripts. This served as a means to check the excerpts in context but also provides a basis for the constructing the narrative between the participants' accounts and the analyst's interpretations

Results

IPA revealed three super-ordinate themes: "You're left behind" revealed how the experience of FoMO impacted the participants' social lives, "I would be anxious" considers participants' reflections on how the experience of missing out results in a state of anxiety, while "Balancing the scales" explores how experiencing FoMO can lead to engaging with protective and coping behaviours.

You're left behind

In this theme participants discussed how engaging with social drinking enables the creation of shared memories, which are used to construct group narratives. By missing out on the opportunities to create and be part of the shared narratives, a sense of social isolation was experienced. David shared his experience of missing a night out:

“It’s whenever you are sitting there the next few days, that’s always the topic of the conversation and then it’s all about that night. I was just sitting there and they are all like, you remember this and that, and I wasn’t there... you’re left behind, you know if you never went out and they are going out meeting new people and all that and they end up going to theirs during the day even when they are not drinking, you know they are just sitting chillin’ out, whereas you’d be left behind at home on your own”

David’s account reveals his perception of the significance of drinking with others, it provides an important social function in enabling the creation of memories which are used to construct a shared narrative that binds the social group together. Missing out on creating the memories results in David being unable to actively participate in the shared narrative, an experience that he finds uncomfortable and isolating. This implies it is important for him to be able to actively identify with his peer group but also reveals his perception that collective alcohol consumption is vital for making friendships. This is further exemplified when he discusses the temporal significance of missing out; he suggests repeatedly engaging in social drinking forges a sense of togetherness that serves as a basis for extending interactions and relationships beyond social drinking. This highlights his perception that collective drinking is imperative for young adults to foster and develop relationships further. David perceives by missing out regularly he would feel stranded in the sense of social isolation, as he would be unable to reap the social gains of collective alcohol consumption.

Similarly, Ashley perceived the consequences of missing nights out:

“You can feel like other people are like having loads of fun together and they are getting to know each other through going out together.. and also people always have sort of these memories from nights out, like sometimes if I’m in the kitchen and then my flat mates might be chatting about something that happened the night before and I’ve no idea what actually happened, so I’ll feel like sort of on my own and I just don’t have a clue what they are saying, I’ll feel left out and hmm... yea so

I think it's good for like, you sort of create inside jokes when you go on a night out and when you are not involved in that and you are missing out on all these memories you make with friends”

Like David, Ashley perceives collective drinking enables the creation of shared memories that are used to construct group narratives. In addition she perceives that by not attending drinking events she would miss out on shared pleasure, implying Ashley not only misses out on the social benefits but also the pleasure-seeking aspect of collective drinking. This highlights her perception of the role alcohol plays in making friends and getting to know people: drinking together enhances experiences and enables greater enjoyment to be shared amongst individuals. In recounting an experience of missing out, Ashley self-marginalises herself and perceives herself as an outsider, who is not privy to the shared narrative. This results in feelings of distress and isolation. When attempting to further explore how she felt, she hesitates and then changes tack to consider the social gains she has experienced from engaging with collective drinking. She highlights how collective drinking has enabled her to feel included. From this she gains a sense of belonging as she is part of the narrative, “*create inside jokes*”. Being able to categorise herself as part of the peer group enables her to garner positive affect from the feeling of inclusion.

In the next extract Mark discusses a time he missed a night out to celebrate a friend’s birthday:

“It was quite isolating, in a sense everyone was going out and having fun and I was the only one that didn't go, and you'd see all the comments and stuff, and there was a few asking like why didn't I go? and it was kinda upsetting cause they know I would normally go but I had others things to do, hmm., and yea I guess it did kinda have an influence on friendships, people wanted to fall out over it but it was pointless in my opinion”

Mark recollects how he vicariously experienced a missed event via social media posts. Doing so was his way of lessening the impact of missing the event as he was able to keep informed about what transpired, however this serves a reminder of what he missed out on. This gave rise to feelings of social isolation, and through this experience he perceives himself as being emotionally isolated, as he was unable to experience and share the good time with his friends. For Mark it is important to be able to share emotions with his social group, implying he

perceives sharing emotion enables strengthening and maintaining of relationships. By missing this opportunity Mark perceives he missed out. By failing to meet his needs for social belonging a state of melancholy is experienced, and further agitation is encountered when his peers use social media to question his non-attendance. Mark may have experienced the additional distress as he perceives himself as a social person who regularly attends events and receiving comment questioning his sociability is perceived as direct criticism of a personal quality that is salient to his self-identity. Mark perceives the experience did negatively influence his relationships and considering how he views himself as a social person, the experience may influence his decision to drink in the future, as he may seek to avoid damaging relationships and his status in the peer group. The next theme considers how participants processed the feeling of missing out.

I would be anxious

Participants discussed how they processed feelings of missing out. Lisa discussed how missing nights out makes her feel:

Lisa: "I meet some new people and they are like were you at that thing and I am like 'No, I missed out on it', then I would be anxious because I know I'm not going to be included in the conversation for the next few minutes.

Interviewer: "Why would you feel anxious?"

Lisa: "Cause I'm going to be left out of the conversation and the others who were there at that event can talk about it, you know I like to be present and included in the conversation and the jokes and stuff..."

Lisa details how she experienced anxiety when she was unable to identify with a new peer group. The new peers invite Lisa to identify with the group, through the shared experience of the recent drinking event. The shared experience and the subsequent narrative are instrumental in developing the new social group, and it highlights Lisa's perception of how collective drinking is used to form and initiate relationships. Missing out on being part of the narrative results in Lisa feeling anxious, as she is acutely aware of her inability to grasp the context of the narrative. Lisa automatically self-marginalised herself from the group interaction, as she 'knows' she won't be included. This may be as she feels she has nothing to add to the interaction and this experience causes her to feel alienated and anxious. This

reveals her FoMO results in her feeling a particular form of social anxiety; Lisa perceives a salient aspect of her self-identity is being sociable, “*I like to be present and included*” and she worries about remaining relevant to her peers. When attending social events, she can express herself as someone who is sociable by engaging with the norms of her peer group. This would enable her to identify with the group and confirm her self-view of someone who is sociable. By contrast when missing out on these events, Lisa is unable to express her self-identity or identify with her chosen peer group, resulting in feelings of anxiety.

In the next extract, Mark describes how he struggled when viewing social media posts from nights out he missed due to a lack of money:

“It kinda made me feel a bit... I wouldn't say down but at the same time I would hmm... little bit of like, like a lack of socialisation from not going on those nights out, cause I knew there wasn't going to be another one of those nights for a long while... hmm... so yea I guess it was kinda the hmm... I guess it was kinda despair in a sense of not being able to control it, like not being able to go out and carry on, it was like I had to accept not being able to go out”

Mark displays hesitation and uncertainty when attempting to process his feelings, implying a degree of anxiety was experienced, reflected in his sense of not being able to reinforce his place within the peer group. Missing these nights out is perceived to place a direct threat to his group membership resulting in feelings of worry and anxiety, especially as he perceives this type of event will not be happening again soon. This highlights Mark's clear fear of being left behind. Mark perceives being sociable as a core part of his self-identity, and not being able to engage with group behaviours to reinforce this self-concept results in experiencing social anxiety and fear. Mark laments the missed opportunity to socialise, and in doing so his experience shifts from feeling anxious to a state of despair, and then a sense of loss, implying an element of fluidity in his experience. The feeling of despair that follows his abstinence stems from Mark feeling powerless in his ability to control his environment. By missing out due to a lack of money, Mark rues the missed opportunity to reinforce his membership in the social group, experienced as a sense of powerlessness. This feeling of powerlessness results in experiencing a sense of loss, as he struggles to accept missing out.

Alternatively, Ryan considers how he would react if he missed a big night out:

“God I'd be like crawling under my skin, ahh I can't believe I've missed that, so like big FoMO yea.. even if it's something that like I don't really want to like, like

I'm not really interested in, like I'd still be feeling ahh might be missing out on a good night, even if it hasn't occurred or even if I never hear about it after”.

Ryan describes experiencing an intense sense of anxiety and frustration from his abstinence, likening his experience to a physiological state of extreme discomfort. These experiences appear to have a profound impact on his thoughts and perceptions; he would still experience FoMO even if the event does not occur or he never hears about it again. Ryan’s experience of anxiety stems from the perception of missing opportunities for new and novel experiences. This contrasts with the other participants, in which their anxiety is caused by fear and worry of being marginalised from their social groups. This implies this experience may be trait like for some, but for others it may be situational. Ryan’s account suggests he is disposed to experience anxiety regardless of the situation, whereas for Lisa and Mark it may be dependent on the context, i.e., if their peers are going out without them. Ryan’s intense sense of missing out exacerbates his FoMO experiences, he only needs to hear about an event once, and his imagination runs wild with thoughts of what could have been. This contrasts with Lisa and Mark, in that their experiences of anxiety are sustained by social prompts (e.g. social media or in-person conversations), whereas Ryan’s experiences are sustained by his internalised desire to seek new sensations and experiences. The next theme considers how participants have engaged in coping behaviours.

Balancing the scales

In this theme participants discussed some of the strategies they used to cope with their experiences of missing out and how they relieve their subsequent FoMO. One strategy was to compensate for missing out by going all-out at future events. Ryan provides an example:

“I've missed a night and then I've been more enthusiastic about the next night and tried to invite all the people out and make it hmm., like a bigger night out, so I feel less bad about missing the other night out. I feel like in an example where I've missed an event and then I'm trying to make a normal night, like a normal club we'd usually attend and then I'd try to make it something big to make up for missing the event, I'd say nights like those where like I said the motive is not as good as it could be, you try to make it better by drinking more, you know these are all the right ingredients for a messy night”.

Ryan discusses how he copes with missing events by going all-out at future events to ameliorate his feelings of FoMO. When he misses nights out, Ryan feels impeded in his ability to identify with his peer group and obtain the subsequent social benefits from being part of the group. This reveals his intrinsic motives for consuming alcohol, and by missing the events Ryan experiences discomfort. To relieve this state he enthusiastically pursues the social gains available at the next night out, aiming to attain a more rewarding and reinforcing experience than the one he perceives he missed out on. His experience of missing out leads to offsetting behaviour, in which his perception of missing out on rewards drives him to seek a greater reward than the one he missed out on. Ryan may believe the more rewarding the experience, the more it will reinforce his place in the peer group. In addition it suggests the social identity of a drinker may be salient to his self-identity and when the identity is threatened, he will act (i.e., make up for the missed night out). Further to this he discusses how compensatory nights out can be enhanced by consuming more alcohol than normal. He perceives the potential for reward increases as there is a greater possibility for something memorable to occur: the more memorable the shared event, the bigger impact the shared narrative will have on reinforcing the group identity. This reveals his perception of alcohol consumption as an intrinsic aspect of a good night. The perception of drinking more to compensate for missing rewards highlights a maladaptive coping response to experiencing FoMO. However Ryan is acutely aware by acting in this way he is likely to suffer personal losses, “all the right ingredients for a messy night”.

In contrast to Ryan, Lisa states she copes with her FoMO experiences by forgetting:

“I just try not to think about it, or try to forget about it... or I have to catch up so like I will like be on even more nights out”.

Lisa highlights how she uses an avoidance tactic to cope with missing out; she attempts to ignore or forget about the uncomfortable feeling altogether, demonstrating a form of emotion-focused coping. Unfortunately Lisa’s attempt to deal with her FoMO is maladaptive. This may result in creating additional stress and she perceives the only way to relieve this state is to engage in a restorative process of attending even more nights out. This suggests Lisa experiences the same form of motivation experienced by Ryan; she is also driven to seek compensation for missing out and that she must “*catch-up*” to restore a semblance of balance to alleviate her discomfort. Later in her interview Lisa also discussed other ways she deals with FoMO:

“Right now with all the events going on its hard but I just have to suck that FoMO away and just like go to lectures. I have this group chat and they post like last night’s mistakes, regrets everything there, so then I will be like filled in, so at times I feel like I don’t need to be there to experience it”.

Lisa experiences a struggle when competing opportunities for reward present themselves, social benefits from drinking and academic reward. In dealing with this dilemma, Lisa reacts by displaying stoicism, highlighting a physiological metaphor (“*suck that FoMO away*”). By using this tactic Lisa suppresses and excises her FoMO, rationalising that reward from achieving academic success is of greater value than the shorter-term rewards of social drinking. By adopting an adaptive approach, Lisa takes the emotion out of the situation and is free from rumination of what she might or might not have missed. Additionally, Lisa highlights a protective strategy for retaining her group membership and for mitigating her FoMO; by vicariously experiencing the group’s shared narrative via group chat, enabling her to see and read about her peers’ exploits. Although her experience is at odds with other participants’ experiences of viewing social media, she describes these experiences using two negative phrases (“...*last night’s mistakes, regrets...*”) hinting that she is happier to mention the bad things that happened to others rather than consider the good things that she missed out on. In the next exert Susan recalls a night of drinking she missed due to working late

Interviewer: “How did you feel when you were viewing the social media posts?”

Susan: “I was gutted to be honest, I was like ah! I could of gone if I was like quick [laughs] but afterwards like hearing some of the stories, I was like right I’m quite glad I didn’t go, I probably would have been in a state just like my friend. If I didn’t go out I’d be upset cause obviously being left out and everything but in the long run I’d be happy about it cause I’d be saving my money and not embarrassing myself”.

Susan initially reports experiencing a more intense sense of FoMO, in that she experienced deep disappointment, rooted in her procrastination. This implies her experience of FoMO can be enhanced if she attaches agency to missing the event. Instead of experiencing FoMO, Susan deals with missing out using a process of cognitive reappraisal: reassessing her

feelings of missing out when she heard direct accounts of the evening's exploits. Susan experiences a discord when the reality of the event meets her imagined sense of missing out on the event. This resulted in her reassessing that in fact she did not miss out but rather she avoided the negative consequences of alcohol consumption. Susan gave greater weight to the personal gains she made while missing out. By using this approach, Susan balanced the scales, readdressing the discomfort she feels at missing out with thoughts of the discomfort she would have felt if she had gone out and drunk to excess. Furthermore it may be that Susan felt missing the event due to work was a socially acceptable reason, hence she may have experienced less worry about her position in the social group and was free to contemplate what she gained from missing out. In addition to using a reappraisal strategy, Susan approaches the discomfort she experiences from missing out in a positive and constructive manner. In using this adaptive approach, Susan can let go and free herself from her FoMO by focusing on what she can gain instead of what she is missing out on. This adaptive approach enables her to adequately deal with her emotions and ensures she does not engage in any maladaptive behaviours such as attending extra nights out.

Discussion

IPA was used to explore experiences of FoMO resultant of missing out on opportunities to drink socially. Results show how the experience of missing social drinking events impacts perceptions: missing social drinking events meant missing out on the chance to create shared memories that are used to construct group narratives. Missing out was perceived as a threat to social status, an extremely important issue for young adults, which resulted in reports of experiencing negative emotions such as anxiety, worry and social isolation. Participants reported using adaptive and maladaptive coping strategies to address these emotions.

The extant literature on young adults' alcohol consumption suggests that collective drinking is a social imperative, enabling young adults to create shared narratives that are used to reinforce group identities (de Visser et al., 2013; Dresler & Anderson, 2017; Griffin et al., 2017). In addition, research studies suggest that young adults perceive a worry and/or a fear of being socially excluded when they are abstinent and will often report engaging in protective strategies to minimise this potential consequence (Bartram et al., 2017; Conroy & de Visser, 2014; Frank et al., 2020). Findings from the current study support these ideas; our

participants perceived the act of collective drinking as being used to forge and maintain social bonds/groups via the creation of shared narratives. Moreover, the results add to the literature by providing an insight into how missing out led to FoMO and our participants experiencing anxiety, worry and fear over the perception of being socially excluded.

The imagined sense of missing out resulted in participants experiencing a form of anxiety where they perceived opportunities to identify with their peer groups were diminished and expressed worry about being left out. Findings from Rifkin et al. (2015) suggest FoMO is driven by anxiety that events in an unattended group experience will come to shape the group in the future; by missing out on this experience, group membership and belongingness are undermined. Furthermore, Lai et al. (2016) highlight that FoMO is perceived as a threat to ingroup status and results in feelings of social exclusion. These findings can help explain why our participants expressed worry over their group memberships; they experienced anxiety over not being part of potentially defining moments in the history of their social group. Missing out on these moments resulted in our participants socially excluding themselves. This suggests that FoMO is a form of social anxiety, and it may play a mediating role between FoMO and future alcohol consumption, highlighted by one of our participant's desire to relieve this state by drinking more than usual at future events.

Participants discussed how collective drinking provides an important social function by enabling the creation of shared memories, which are used to create narratives that foster and strengthen social groups. Evidence from Tavani et al. (2015) highlights how shared renderings of the past enable identification with a social group. Using historical events and/or childhood objects they showed individuals who shared common memories were more likely to be perceived as an ingroup member, compared to those who did not. Likewise, our participants formed collective memories about their social drinking, e.g., in-jokes or recollections of memorable deeds. These renderings were used by group members as part of a social categorisation processes to confirm or deny inclusion status of the group. Our findings highlight how FoMO impacts young adults' social worlds; participants who miss out were unable to acquire the collective memories that affirm their position in peer reference groups.

Missing out on being part of shared narratives resulted in participants feeling socially isolated, reflecting their inability to meet the psychological need for belongingness. Self-determination theory suggests the need to belong is an innate drive that influences beliefs (Baumeister & Leary, 1995; Deci & Ryan, 1985). Evidence suggests the need to belong is

positively associated with FoMO (Beyens et al., 2016) and it mediates the relationship between FoMO and problematic social network usage (Yin et al., 2019). Regarding alcohol, Litt et al. (2012) were able to demonstrate that the need to belong moderated the relationship between alcohol-related cognitions (attitudes, descriptive norms, willingness) and behaviour. This implies individuals with a greater need to belong may be more receptive to ingroup norms of heavy drinking and more likely to conform to this norm.

The experience of FoMO resulted in a sense of social isolation, at least partly as participants were unable to meet their need for belongingness, which can be met through social drinking. Thus, the need to belong may moderate FoMO from missing opportunities to drink socially: those displaying a greater need to belong may experience a keener sense of missing out. This idea is plausible given we know that those with higher levels of need to belong, place greater importance, and spend more time on interpersonal relationships and social connections (Baumeister & Leary, 1995).

Another novel finding from our study is consideration of coping strategies young adults use to cope with experiencing FoMO. Participants reported a mix of adaptive strategies, like cognitive reappraisal and maladaptive strategies, such as trying to forget or vicariously experiencing the missed events. In addition they also discussed engaging with compensatory behaviour, e.g. drinking more at future events. The coping experiences can be interpreted in relation to the Cognitive Motivational-Relational Theory of Coping (CMRT: Lazarus, 1991), which highlights how stressful experiences are dealt with engaging with either problem-focused or emotion-focused strategies.

Our participants displayed both coping responses. Lisa and Ryan engaged with problem-focused strategies: they planned more nights out and increased their effort to make the nights more memorable, to reassert group membership. Nevertheless, this problem-focused approach cannot resolve the issue which happened in the past, only attenuate the unpleasant emotions caused by missing out. This suggests that while problem-focused strategies can be utilised to relieve FoMO, they can end up causing negative physical health outcomes. Lisa reported engaging with an additional and more adaptive, problem-focused approach. She assessed that academic achievement is a bigger priority than socialising. She goes further, using social media to vicariously experience the missed nights out, enabling her to retain a sense of belonging. Nonetheless she only focused on the negative experiences of others. Susan reported using both emotion and problem-focused coping strategies; Susan initially

used an emotional strategy by engaging in wishful thinking, contemplating how her situation could have been different. However, her response shifts to a more problem-focused strategy by assessing her priorities, appraising that it was better in the long-term to avoid the night out, as she saved herself money and spared herself a hangover and social embarrassment.

Future studies could explore potential mediators and/or moderators of FoMO and drinking behaviour; for example, does the need to belong moderate this relationship or does social anxiety have a mediating effect? Such findings could enable a deeper understanding of this phenomenon. The paper has strengths: novel findings on how individuals process and cope with FoMO but also how the experience impacts young adults' alcohol-related perceptions. Nonetheless there are limitations: this paper only considers social factors that influence drinking decisions and while it is beyond the scope of this paper to consider the myriad of cultural, environmental or policy influences, it must be acknowledged that social processes are only one part of the decision to consume alcohol. The homogeneity of the participants in terms of their shared white ethnicity means the results may not reflect the experiences of other ethnic groups, research with more ethnically diverse samples is needed.

In conclusion this study highlights how missing out on social drinking opportunities and subsequent FoMO influences perceptions of alcohol consumption. FoMO was experienced when missing opportunities to identify with peers through attendance at social-drinking events. FoMO was experienced as a sense of anxiety, worry, despair and loss. Engaging in collective drinking provides an important social function in enabling the creation of shared narratives that are used to foster and strengthen social groups. Missing out on being part of the narratives resulted in participants social excluding themselves and experiencing social isolation. Participants discussed ways to cope with FoMO, including adaptive strategies such as cognitive reappraisal and maladaptive strategies such as engaging with compensatory behaviour. Understanding how this form of abstinence and resulting feelings of FoMO impacts perceptions enables a deeper insight into the factors that influence young adults' alcohol consumption.

Chapter Summary

The chapter further contributed to the aims of the thesis by providing key findings on the experience of inaction regret in the form of FoMO. Findings highlight how missing out on social drinking events leads to self-isolation, as participants were unable to gain the shared memories created during drinking events that are used to reinforce group identities and increase a sense of belonging. This resulted in participants experiencing worry and anxiety, specifically regarding their inclusion in social groups, hence FoMO may be a specific form of social anxiety. Findings also highlighted approach strategies used to deal with FoMO, such as cognitive reappraisal, but also avoidance strategies such as attending more events or drinking more alcohol than usual. This suggests FoMO may drive alcohol consumption. The next chapter sought to explore this suggestion by examining if FoMO predicts future plans to drink (intentions) and consumption.

Chapter Five

All the right ingredients for a messy night! How the Fear of Missing Out impacts on Alcohol Consumption

This chapter presents an ecological momentary assessment study. The contributions of this chapter are as follows; I designed the study, approved by Richard Cooke. I undertook the data collection, analysis, and manuscript write-up. Richard Cooke, Andrew Jones, and Abigail Rose all provided feedback before submission.

Abstract

Objective: Young adults often report consuming alcohol to achieve social gains, like making new friends or strengthening current ties. Missing opportunities to obtain these gains can give rise to a form of regret known as the Fear of Missing Out (FoMO). Past studies have identified links between FoMO and excessive alcohol consumption and shown that FoMO may drive future consumption by increasing drinking intentions. The aim of the current study was to examine if FoMO predicts alcohol consumption and drinking intentions, using ecological momentary assessment.

Method: One hundred and five UK adults (aged 18 to 30; 64 females, 41 males) completed assessments of FoMO and drinking intentions three times a day (morning, afternoon, evening) on three consecutive weekends (Friday, Saturday, Sunday). Alcohol consumption was recorded once per day, based on consumption from the previous day.

Results: Repeated mixed model analyses found that FoMO had a significant association with both consumption ($b = .06, p = .01$) and drinking intentions ($b = .47, p < .001$). Being male ($b = 2.81, p = .029$) and reporting higher intentions ($b = 0.5, p < .001$) were both associated with higher consumption.

Conclusion: This is the first study to use EMA to show that FoMO is associated with alcohol consumption and drinking intentions. Considering that FoMO is completely psychological, it may be a viable intervention target to reduce future alcohol consumption and drinking intentions.

Introduction

Twenty four percent of UK adults report regularly exceeding the Chief Medical Officer's low risk drinking guideline to consume no more than 14 units¹ of alcohol per week (Chief Medical Officer, 2016). Consuming alcohol above this guideline has been linked to negative short-term (blackouts, hangovers, violence) and longer-term (cancers, liver disease) health consequences (Jones et al., 2020; NHS, 2018; Public Health, 2016). Young adults (aged 18-30) have been identified as the group who most likely to exceed safe guidelines (ONS, 2016), and the most likely to suffer alcohol-related harm (Rehm et al., 2009). Consequently, health promotion campaigns have been implemented to try and reduce young adults' consumption.

Health campaigns often focus on linking excessive drinking with experiencing negative consequences (Niland et al., 2011). However, these campaigns have generally been shown to be ineffective (Babor, 2010). One explanation for this is that campaigns rarely acknowledge that alcohol consumption is a behaviour performed to achieve social gains (e.g., increased sociability and social bonding; de Visser, 2021), or that social gains may be more salient than negative consequences when decisions about drinking are made (Crawford et al., 2020). Moreover, young adults may fear 'missing out' on social gains more than experiencing negative consequences.

Young adults report experiencing an aversive feeling of missing out on desirable social experiences (Milyavskaya et al., 2018), labelled the 'Fear of Missing Out' (FoMO), which is defined as the apprehension that others are having a rewarding experience from which one is absent (Przybylski et al., 2013). Crawford et al. (2022a) reported that UK university students would rather experience the negative consequences of excessive drinking than miss out on social gains—novel and shared, experiences, in-jokes—they obtain from attending social drinking events. Support for these claims comes from Riordan et al. (2015) who found that New Zealand university students' FoMO scores were positively associated with consumption in a single session ($r = .17$) and alcohol-related harms ($r = .30$). Other data shows students report offsetting feelings of FoMO by attending more drinking events and compensating for missing out on previous social events by drinking more than usual amounts at these events (Crawford et al., 2022b). Thus, experiencing FoMO may increase the frequency and quantity

¹ 1 UK unit = 8g of pure alcohol

of consumption. This study tested the possibility that fear of missing out predicts future alcohol consumption and drinking intentions.

To date, the relationship between FoMO and consumption has only been assessed using retrospective accounts or using analyses where results are compared between participants based on a single measure of FoMO. Therefore it is unknown if within-person fluctuations in FoMO affect consumption; if FoMO is high at a particular point in time, such as the day after missing a drinking event, does that make consumption more likely in the future? One way to address this issue is to use ecological momentary assessment (EMA) to capture fluctuations in FoMO. EMA involves repeated sampling of participants' present actions and experiences (Jones et al., 2018; Jones et al., 2020, Shitffman, 2009), enabling researchers to measure experiences closer to performance of behaviour often in ecologically valid settings.

Drinking intentions, i.e., plans to consume alcohol, have been shown to have a large-sized positive correlations with consumption in survey studies (Cooke et al., 2016) and EMA studies (Labhart et al., 2017). Past research has shown that intentions are predicted by measures of anticipated regret (Ajzen & Sheikh, 2013; Barratt & Cooke, 2018; Cooke et al., 2007), a form of *action* regret (i.e., regret about things you did). Alternatively, one can experience regrets about *not* performing a behaviour, labelled *inaction* regret (i.e., regret about things you did not do); FoMO can be thought of as a form of inaction regret, such as over missing opportunities to capitalise on social gains (Crawford et al., 2020).

Several lines of reasoning support the idea that inaction regret, in the form of FoMO, may predict drinking intentions. First, Brewer et al.'s (2016) meta-analysis of health behaviour studies found that inaction regret had a larger association with intention than action regret, across all health behaviours². Second, the temporal theory of regret suggests temporal changes in regret are driven by the nature of the regretted choice, with regrets from inaction increasing over time (Gilovich & Medvec, 1994). This suggests that FoMO may vary in intensity during different periods of the day, or as time passes following the missed drinking event. In contrast, the negative consequences experienced following action (e.g., hangovers, nausea) are likely to fade, leaving behind the social gains, such as in-jokes and shared experiences. The negative consequences of action regret are overlooked when discussing drinking events (Crawford et al., 2020).

² Brewer et al. only found one paper that measured inaction regret for alcohol and because this paper sampled pregnant women, it is uncertain that results would generalise to young adults.

The primary aim of this study was to test the possibility that FoMO predicts future alcohol consumption. The secondary aim of this study was to test if FoMO predicts drinking intentions. The following hypotheses were tested:

H1: Experiencing higher levels of FoMO will result in greater recorded alcohol consumption

H2: Experiencing higher levels of FoMO will result in higher drinking intentions

Method

Participants

One hundred and thirty-eight young adults, aged 18-30, were recruited via recruitment websites Call for Participants (n = 68) and Prolific (n = 49) or responded to advertisements placed on a research pool at a university in northwest England (n = 21). Inclusion criteria were drinking alcohol at least once a week and having a score between 8-19 on the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993). Scores in this range indicate drinking at a hazardous or harmful levels. Twenty-five participants were excluded as they scored <8 on the AUDIT. Eight participants were excluded as they scored >19 on the AUDIT – they were advised they should consider contacting their local GP or a UK national alcohol charity ‘Drinkline’ if they were worried about their consumption. After exclusions, the final sample comprised 105 participants (61% female (n = 64); Mean age = 20.1 years (SD = 3.69); Mean AUDIT score = 13.65 (SD = 3.94)).

Materials

Screening Measure

The AUDIT is a 10-item screening tool developed by the World Health Organisation (Saunders et al., 1993) to identify potentially dependent alcohol use. The items assess drinking patterns (e.g., “*How often do you have a drink containing alcohol?*”) and alcohol-related harm/consequences (e.g., “*Have you or someone else been injured as a result of your drinking?*”). The AUDIT has excellent reliability in the general population (Selin, 2003) and university students, $\alpha = .79$ (Campo-Arias et al., 2013).

Baseline Measures

Timeline follow back (TLFB; Sobell & Sobell, 1992) assessed past alcohol consumption. Individuals provided retrospective estimates of their daily drinking over the previous two weeks using a calendar with memorable dates noted as prompts. To aid individuals in recording their drinking, the measure was adapted to include images of UK relevant drink measures. The TLFB has been shown to have excellent reliability (Sobell et al., 1996).

Self-control was assessed using the Brief Self-Control Scale (BSCS; Tangney, Baumeister & Boone, 2004). The BSCS is a 13-item Likert scale measuring trait self-control (e.g., “*I say inappropriate things*”), ranging from 1 to 5 (1 – not like me at all, to 5 – very much like me), and has been shown to have good reliability, $\alpha = .83$ (Tangney et al., 2004).

As data collection took place during the COVID-19 pandemic, COVID-19 risk perceptions were assessed using items from Yildirim et al. (2020). The current study adapted the Likert scale from a 5-point to a 0-100 scale (0 – Not at all, 100 – Great extent) to capture a wider range of perceptions. The measure assessed individuals’ perceived fear of COVID-19 using three items (e.g., “*I am terrified of COVID-19*”), and perceived threat of COVID-19 using two items (e.g., “*What is the probability of you developing COVID-19 during the pandemic?*”). The scale has been shown to have acceptable reliability (Yildirim et al., 2020).

Daily Measures

FoMO was assessed using an item from Riordan et al. (2018), which provided a definition of FoMO (“*The fear of missing out (FoMO) is when you imagine others are having a rewarding experience without you*”) and then asked participants to report how much FoMO they were currently experiencing. The item’s scale was adapted from a 5-point (1 – no, not true of me, 5, yes, extremely true of me) to 0–100 (0 – No FoMO, 100 – Extreme FoMO). The item was adapted to provide participants with the opportunity to record a greater range of FoMO intensity.

Participants indicated their intention to consume alcohol (“*Indicate your intention to consume an alcoholic drink today*”) using a single item on a scale of 0-100 (0 – low intention, 100 – high intention), taken from French and Cooke (2012).

Alcohol consumption was measured by providing participants with an image of standard UK drink sizes and then asking them to record the number and types of drinks they consumed the

previous day, e.g., two pints of Carlsberg and four shots of tequila. These recordings were later converted to UK alcohol units.

Procedure

The study was approved by the host university's ethics committee. Data collection ran during the second and third UK COVID-19 national lockdowns (November 2020 to April 2021). Participants provided informed consent before completing the screening measure. All data collection took place online using surveys administered via Qualtrics. After screening, participants were sent the initial survey assessing baseline measures. Next, participants were sent a link to a survey containing the daily measures three times a day (at 10:00, 14:00 and 19:00) on Fridays, Saturdays, and Sundays for three consecutive weeks. Participants were asked to record their current levels of FoMO and drinking intentions, with alcohol consumption reported once based on consumption during the previous day (i.e., Thursday, Friday, Saturday). Evidence suggests these are the days in which young adults drink most (Davis et al., 2010; Lacet et al., 2016). In total, participants completed a maximum of 27 measures of FoMO and intentions, and a maximum of nine surveys of their consumption, over three weekends. After data collection, participants were fully debriefed and reminded of their right to withdraw.

Data Analysis

A repeated measures mixed model was used to account for the nested data, i.e., time points nested within participants. We estimated fixed effects according to the focal independent variables (FoMO and drinking intention) and covariates (time of day, day of the week and week of study), whilst accounting for the control variables (gender, past drinking behaviour, self-control, fear of COVID-19 and threat of COVID-19). For the consumption model 'time of day' was not included as a covariate as participants were only asked to record alcohol consumption once. In addition, the consumption model only includes consumption scores for Fridays and Saturdays, as recorded scores on Fridays represent consumption from the preceding Thursday. Random intercepts between participants were factored in and included a random effect of time, which enabled us to model variability in intercepts and slopes within participants. We examined interactions to assess and account for any changes in the outcome variables (alcohol consumption and drinking intentions) over time, e.g., an interaction of time points with FoMO. We used restricted maximum likelihood estimation method and an unstructured covariance structure. To model residual within-subjects variance, due to the lag-

effect, we added a final step in both models to account for any nuisance variance (i.e., the correlation between time points), using an autoregressive covariance structure. All analyses were performed using SPSS 26.

Results

Descriptive analyses

Almost three quarters (73.3%) of the sample completed a minimum of one full day of questionnaires over each week of the study duration. This equated to 1288 individual responses. Average alcohol consumption in the two weeks prior to the study was 38.50 units (SD = 26.16), suggesting hazardous weekly alcohol use (Public Health, 2016). The average score for self-control was 34.49 (SD = 7.71). The average score for perceived fear of COVID-19 was 79.75 (SD = 67.23), and perceived threat of COVID-19 was 90.26 (SD = 53.42). These scores were on the lower end of the scales, indicating participants viewed the risks of COVID-19 as relatively minimal. The average FoMO score across all time points and participants was 28.68 (SD = 27.13; Median = 20.00, Mode = 0.00, IQR = 42.00) indicating relatively low levels of FoMO. The average intention score across all time points and participants was 45.20 (SD = 35.84; Median = 41.00, Mode = 100, IQR = 70) just below the mid-point of the scale. The average amount of alcohol consumed across all time points and all participants was 9.06 units (SD = 6.72) per day, suggesting heavy episodic patterns of alcohol use. Alcohol consumption varied by day; on Thursdays, participants recorded drinking on average 7.65 (SD = 5.97) units, on Fridays 10.64 (SD = 7.76) units and Saturdays 8.50 (SD = 5.76) units. Drinking intentions were higher on Fridays (M = 50.72, SD = 35.14) and Saturdays (M = 48.51, SD = 36.46) than Sundays (M = 36.12, SD = 34.20). FoMO scores peaked on Fridays (M = 31.77; SD = 27.63) before declining on Saturdays (M = 28.75, SD = 26.36) and Sundays (M = 25.74, SD = 27.17). Table 1 summarises results for FoMO and Table 2 results for intentions for week of study; there was little evidence for differences due to week of study

Table 5.1: FoMO scores for Time of Day and Day of the Week

	Morning (n = 369)	Afternoon (n = 427)	Evening (n = 357)	Total (n = 1153)
Friday (n = 373)	50.78 (33.10)	50.73 (35.12)	50.64 (37.47)	50.72 (35.14)
Saturday (n = 396)	47.06 (35.64)	47.58 (35.23)	51.20 (38.89)	48.51 (36.46)
Sunday (n = 384)	31.78 (30.33)	36.44 (33.68)	40.11 (37.99)	36.12 (34.20)
Total (n = 1153)	43.17 (34.04)	45.01 (35.15)	47.20 (38.37)	

Table 5.2: Intention scores for Time of Day and Day of the Week

	Morning (n = 362)	Afternoon (n = 426)	Evening (n = 353)	Total (n = 1141)
Friday (n = 363)	28.95 (28.12)	32.99 (26.91)	33.27 (27.97)	31.77 (27.63)
Saturday (n = 388)	26.95 (26.91)	28.25 (25.67)	31.40 (26.67)	28.75 (26.36)
Sunday (n = 390)	25.58 (26.61)	27.11 (28.75)	24.32 (25.95)	25.74 (27.17)
Total (n = 1141)	27.15 (27.18)	29.34 (27.18)	29.45 (27.05)	

Repeated Measures Mixed Model for Alcohol Consumption

None of the time trends significantly described the pattern of alcohol consumption over time: linear, $p = .81$, quadratic, $p = .35$ and cubic, $p = .31$. The relationship between time and alcohol showed non-significant variance in intercepts across participants, $\text{Var}(u_{0j}) = 27.22$, $\chi^2(1) = +4.04$, $p > .05$. However, slopes varied across participants, $\text{Var}(u_{1j}) = .14$, $\chi^2(1) = 17.59$, $p < .01$, and intercepts and slopes negatively and significantly covaried, $\text{Cov}(u_{0j}, u_{1j}) = -1.36$, $\chi^2(1) = 17.59$, $p < .01$, suggesting those who decreased their consumption during the study, reported drinking most at the start. In addition, there was a significant and positive relationship between participants' consumption at adjacent time points, with a covariance of $.70$, $p < .001$.

Table 3 provides results for the repeated measures mixed model for alcohol consumption. Gender, $b = 2.81$, $p = .029$, 95% CI [.31, 5.32], drinking intentions, $b = .05$, $p < .001$, 95% CI [.03, .07], and FoMO, $b = .06$, $p = .011$, 95% CI [.01, .10] all significantly predicted consumption. Being male, reporting higher intentions (see Figure 1) and higher FoMO (see Figure 2) were all associated with higher consumption. There was also significant interaction between FoMO and time, $F(1, 23.02) = 6.32$, $p = .01$, with FoMO having a greater effect on consumption towards the start of the study, $b = -.01$, $p = .005$, 95% CI [-.01, -.002]. As time progressed, the effect of FoMO on consumption reduced. Neither the time level variables, Day of the Week, $p = .72$ and Week of Study, $p = .07$, nor the control variables, Past Behaviour, $p = .49$, Self-Control, $p = .12$, Fear of COVID-19, $p = .29$, or Threat of COVID-19, $p = .48$, had any effect on consumption.

Table 5.3: Mixed Model for Alcohol Consumption

I = Model, II = I + Day of Study, IV = Variables, V = VI = V + VI + = VII + within-subjects <.05, ** = *p* <.001

Parameter	I	II	III	IV	V	VI	VII	VIII
Fixed Intercept	9.09 (.62)***	9.11 (.84)***	7.77 (4.84)	14.54 (6.23)*	9.80 (6.53)	7.49 (7.02)	7.42 (6.96)	13.08 (5.70)*
Day of the week			1.88 (1.04)	1.64 (1.06)	.83 (1.17)	1.41 (1.24)	-.92 (1.24)	.47 (.89)
Week One			.010 (3.63)	-.45 (3.67)	-3.52 (4.17)	-3.41 (2.68)	-2.71 (4.40)	-6.09 (3.08)*
Week Two			.14 (1.91)	-.20 (1.93)	-1.37 (2.20)	-1.46 (1.41)	-.88 (2.31)	-2.97 (1.85)
Gender				1.37 (1.13)	3.16 (1.09)*	3.17 (1.23)*	2.95 (1.21)*	2.81 (1.24)*
Past behaviour				.01 (.02)	.001 (.02)	-.001 (.02)	-.001 (.02)	.01 (.012)
Self-control				-.22 (.08)*	-.15 (.08)	-.16 (.09)	-.14 (.09)	-.15 (.09)
Fear of COVID				-.01 (.01)	-.01 (.01)	-.01 (.01)	-.01 (.01)	-.01 (.01)
Threat of COVID				-.01 (.01)	.002 (.01)	.002 (.01)	.003 (.01)	-.003 (.01)
Intention					.07 (.01)***	.07 (.01)***	.06 (.01)***	.05 (.01)***
FoMO						.003 (.01)	.06 (.03)*	.06 (.02)*
FoMO*Time							-.01 (.003)*	-.01 (.002)*
Random								
Time		-1.36 (.60)*	-1.32 (.59)*	-1.23 (.57)*	-2.2 (.44)*	-1.20 (.61)*	-1.00 (.56)	.02 (.28)
Within-subjects autocorrelation								.70 (.05)***
Deviance (-2LL)	2931.77	2917.10	2899.51	2798.74	2147.37	1968.63	1970.59	1853.23

Unconditional Linear Time, III Week + Week III + Control IV + Intention, FoMO, VII = Interaction, VIII Residual variance. * = *p* <.01, *** = *p* <.001

Figure 5.1: The relationship between Drinking Intention and Consumption

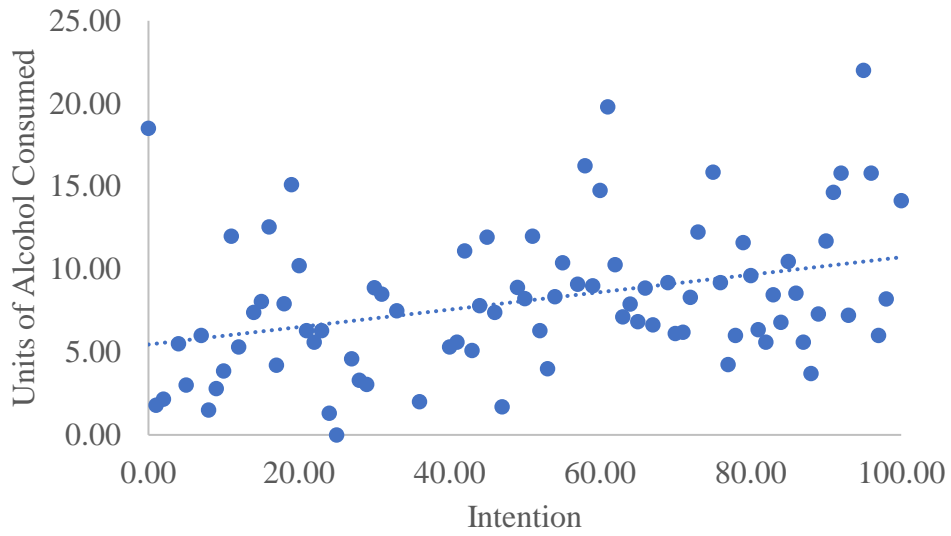
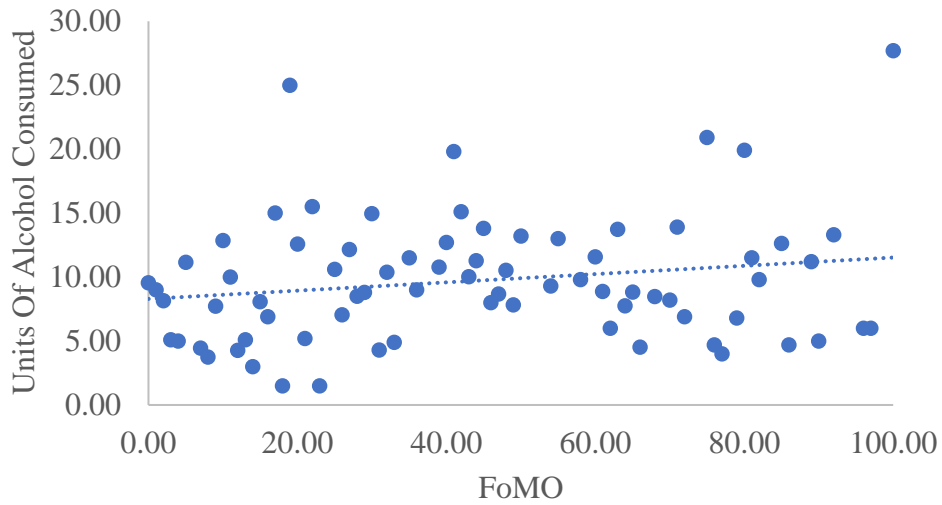


Figure 5.2: The relationship between FoMO and Alcohol Consumption



Repeated Measures Mixed Model for Drinking Intentions

Time had a significant effect on drinking intention; a cubic trend significantly described the pattern of data over time, $F(1, 1095.60) = 22.65, p < .001$, with intentions decreasing over time, $b = -.01, p < .001$. The effect of time resulted in an overall decrease of 0.27 units over the course of the study. The relationship between time and intentions showed significant variance in intercepts across participants $\text{Var}(u_{0j}) = 384.07, \chi^2(1) = 13.56, p < .01$. In addition, the slopes varied across participants, $\text{Var}(u_{1j}) = 3.28, \chi^2(1) = 37.51, p = .002$, and the intercepts slopes negatively and significantly covaried, $\text{Cov}(u_{0j}, u_{1j}) = -.02, \chi^2(1) = 37.51, p = .01$, suggesting those that decreased their drinking intentions over the study, reported higher intentions at the start. Further to this, there was a significant and positive relationship between intentions at adjacent time points, with a covariance of .47, $p < .001$.

Table 4 provides results for the repeated measures mixed model for drinking intentions. Day of the Week predicted intentions: Participants recorded significantly higher drinking intentions on Fridays, $b = 12.34, p = .001, 95\% \text{ CI } [5.11, 19.26]$ and Saturdays, $b = 10.11, p < .001, 95\% \text{ CI } [4.89, 14.97]$ compared to Sundays. There was no significant difference between Fridays and Saturdays, $p = .39$. Past Behaviour, $b = .22, p = .02, 95\% \text{ CI } [.04, .41]$, and FoMO, $b = .47, p < .001, 95\% \text{ CI } [.35, .51]$, both had positive effects on intentions (see Figures 3 and 4). There was no significant effect of Time of Day, $p = .64$ or Week of Study, $p = .44$, nor any significant effect of the additional control variables: Gender, $p = .78$, Self-control, $p = .08$, Fear of COVID-19, $p = .56$ and Threat of COVID-19, $p = .64$. There was no significant interaction between FoMO and Time $p = .39$ nor any interaction between FoMO and the Time of Day, $p = .81$.

Table 5.4: Mixed Model for Drinking Intentions

Parameter	I	II	III	IV	V	VI	VII
Fixed Intercept	43.41 (2.31)***	57.65 (3.83)***	38.18 (9.80)***	43.98 (18.07)*	38.75 (18.36)*	35.86 (18.57)	34.04 (19.32)
Morning			-4.65 (2.29)	-5.03 (2.33)	-3.84 (2.29)	-2.91 (3.22)	-4.63 (2.66)
Afternoon			-2.88 (2.10)	-2.97 (2.14)	-1.46 (2.09)	-2.64 (3.07)	-3.25 (2.40)
Friday			14.96 (3.2)***	14.81 (3.23)***	11.77 (3.19)***	11.93 (3.20)***	12.34 (3.61)*
Saturday			13.11 (2.31)***	12.93 (2.36)***	9.35 (2.31)***	9.54 (2.32)***	10.11 (2.58)***
Week One			4.88 (5.24)	5.01 (5.33)	3.49 (5.25)	3.88 (5.27)	4.89 (6.26)
Gender				4.35 (4.55)	.67 (4.73)	.74 (4.70)	1.32 (4.65)
Past behaviour				.25 (.09)*	.22 (.10)*	.22 (10)*	.22 (.09)*
Self-control				-.56 (.33)	-.63 (33)	-.63 (33)	-.59 (.33)
Fear of COVID				.02 (.04)	.03 (.04)	.02 (.04)	.02 (.04)
Threat of COVID				-.04 (.05)	.47 (.04)	-.02 (.05)	-.02 (.05)
FoMO					.47 (.04)***	.52 (.09)***	.47 (.08)***
FoMO*Time						-.01 (.01)	-.004 (.01)
FoMO*Morning						-.03 (.08)	.001 (.07)
FoMO*Afternoon						.04 (.08)	.03 (.06)
Random							
Time		-.02 (.01)*	-.02 (.01)*	-.02 (.01)*	-.01 (.01)	-.01 (.01)	-.01 (.01)
Within-subjects autocorrelation							.47 (.04)***
Deviance (-2LL)	11292.52	11241.10	11175.39	10762.81	9909.68	9923.45	9779.09

I = Unconditional Model

II = I + Cubic Time

III = II + Time of Day + Day of Week + Week of Study

IV = III + Control variables

V = IV + FoMO

VI = V + Interactions

VII = VI + residual within-subjects variance

* = $p < .05$, ** = $p < .01$, *** = $p < .001$

Figure 5.3: The effect of Past Drinking Behaviour on Drinking Intentions

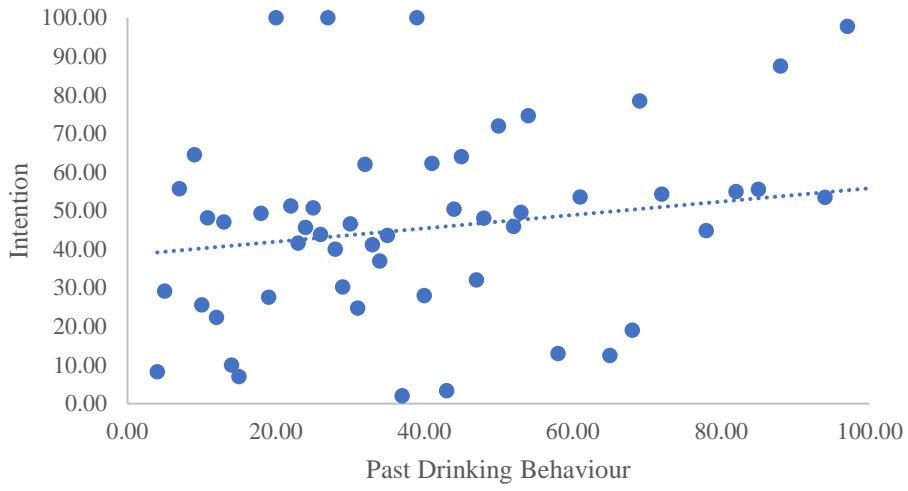
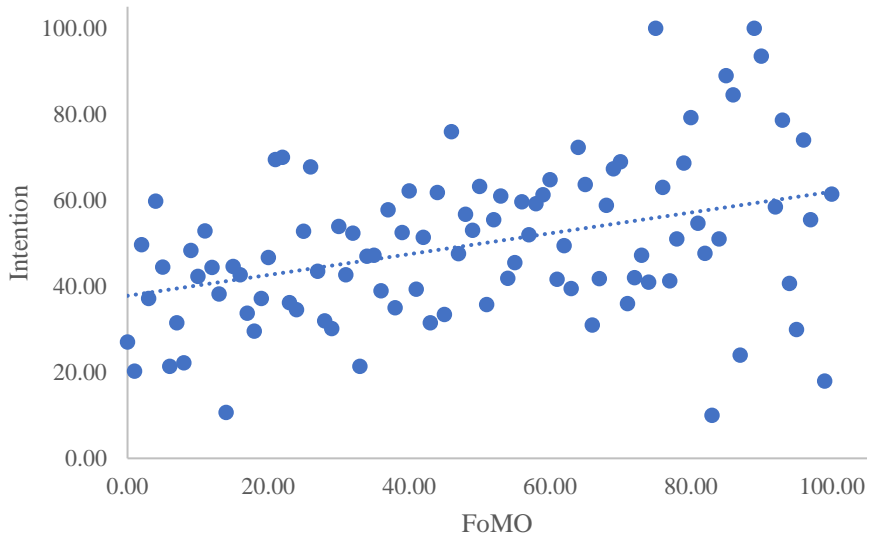


Figure 5.4: The effect of FoMO on Drinking Intentions



Discussion

The current study used EMA to test the possibility that FoMO predicts future alcohol consumption and drinking intentions. As hypothesised, experiencing higher levels of FoMO was associated with increased consumption and higher intentions. Higher drinking intentions were also associated with higher consumption, there was evidence that drinking intentions were higher on Fridays and Saturdays and consumption was highest on Fridays.

To our knowledge, this is the first study to use EMA to show that FoMO is associated with alcohol consumption corroborating previous findings based on retrospective survey accounts (Riordan et al., 2015) and qualitative accounts suggesting FoMO can drive consumption (Crawford et al., 2022a; Crawford et al., 2022b). In contrast, previous literature has consistently failed to find evidence linking consumption to anticipated regret (Agrawal & Duhachek, 2010; Cooke & Crawford, 2021). Study findings are consistent with Brewer et al.'s (2016) meta-analysis which found larger correlations between health behaviours and inaction regret than equivalent correlations for action regret. In addition, Albarracin and Hart (2013) highlight that inaction and negative mood have a greater impact on decision-making and performance than action and negative mood. These findings offer an explanation as to why anti-drinking campaigns that highlight negative affect (e.g., regret from inebriated behaviours) experienced following excessive consumption have been shown to be ineffective at reducing alcohol consumption (Babor et al., 2010). The results of the current study highlight a potential new avenue for intervention - by targeting the negative emotion caused by inaction (i.e., FoMO following missing opportunities for social drinking), we may be able to reduce consumption.

Consistent with past research (Cooke & Crawford, 2021; Cooke et al., 2016; Todd et al., 2016) drinking intentions significantly predicted alcohol consumption. Although Cooke et al.'s (2016) meta-analysis found intentions to have on average, a large-sized relationship with consumption in prospective survey studies ($r_+ = .54$), the results of the current study highlight a smaller effect. Nevertheless, an EMA study by Labhart et al. (2017) reported a large-sized relationship between intentions and consumption ($r = 0.70$), and although both studies did measure consumption on Fridays and Saturdays, Labhart et al. collected their data over two days rather than nine days. It is possible that repeatedly reporting intentions during the study reduced the size of the relationship with consumption or that intentions measured relatively

distantly from consumption (i.e., in the morning) reduced the size of prediction. Further studies are needed to investigate this effect.

Results also show drinking intentions were highest on Fridays and Saturdays, supporting evidence for a trend for higher drinking intentions and consumption at the weekend, compared to other days of the week (Davis et al., 2010; Lac, Handren & Crano, 2016; Lau-Barraco et al., 2016.). When conducting survey studies it may make sense to reflect on which day of the week intentions are measured on; if intentions are measured on day when consumption is unlikely, (e.g., Sunday, Monday) they might not predict consumption on the days when it occurs (e.g., Fridays, Saturdays).

The study also found FoMO predicted drinking intentions. According to Ajzen's (1991) Theory of Planned Behaviour, intentions are based on salient beliefs about behavioural performance. Thus, FoMO's impact on drinking intentions could be explained by considering how the experience of missing out impacts salient behavioural, normative and control beliefs regarding consumption (see French & Cooke, 2012). For example, when hearing about or viewing social media posts of a missed event, individuals are reminded of the outcome expectancies of engaging with social drinking (e.g., having fun, making new friends, Crawford et al., 2022a). In addition, the notifications of missed events reinforce the approval of engaging with consumption; positive alcohol-related images are ubiquitous online (Hendriks et al., 2018; Lyons et al., 2016). The activation of salient behavioural and normative beliefs via notification of missed events gives rise to the sense of missing out, and in turn motivates greater intention for future drinking. Positive posts viewed by individuals who did not attend an event could serve to amplify feelings of FoMO because those individuals are seeing the social gains and not experiencing the negative consequences (Crawford et al., 2022a).

Future directions

Considering that FoMO, a psychological construct, appears to inform both future consumption and drinking intentions, interventions targeting FoMO offer a potential technique to reduce consumption and intentions; interventions could target the beliefs that underlie the experience of FoMO to modify them. For instance, interventions could emphasise that only positive depictions of missed events are shared on social media, that the potential for missing out on social gains is distorted and inflated, and that negative experiences, such as having hangover or feeling nauseous, are unpleasant. Such an

intervention could be delivered during particularly stressful times, i.e., the hours leading up to a drinking event, or after the missed event to reduce the likelihood of future excess drinking. This could be identified during pilot work with participants who wish to cut down their drinking. One proposal would be to deliver interventions on days when drinking is most likely, e.g., Fridays and Saturdays, (although see Murgaff et al., 2007). They could be labelled as Ecological Momentary Interventions (EMI) (see, Heron & Smyth, 2010 and Riordan et al., 2015).

Strengths and limitations

The current study has several strengths. FoMO and drinking intentions were collected in real-time, providing a smaller measurement gap between these variables and consumption than is typically found in survey research. As noted by Ajzen (1996) the shorter the gap between measurement of intentions and behaviour the more likely intentions are to predict behaviour, because intentions are less likely to have changed. More stable intentions are usually better predictors of behaviour compared with less stable intentions (Cooke & Sheeran, 2004, 2013). Consumption was measured on three separate weekends, providing confidence in the reliability of findings.

The study also has several limitations. The timeframe of data collection, during the second and third lockdown of the UK COVID-19 pandemic, means we are not certain that the effects reported represent how FoMO influences consumption and drinking intentions; our participants were limited to socialising with their household or a ‘social bubble’ (i.e., a select and small social group) and access to drinking establishments was either totally or partially restricted due to lockdown. Nevertheless, the fact we found effects of FoMO on consumption even under restricted drinking conditions suggests that FoMO is a pervasive influence on consumption that is likely to have stronger effects when pandemic restrictions are relaxed. A further limitation is the results are only generalisable to young adults in the UK. Replication studies in other countries and other populations would improve understanding of how, or if, FoMO influences consumption in other locations.

To conclude the current study demonstrated that FoMO assessed in the moment significantly predicts alcohol consumption and drinking intentions. These results highlight how an imagined sense of missing out has a real effect on individuals’ perceptions and behaviour.

Chapter Summary

This chapter contributed to the aims of the thesis by testing if inaction regret in the form of FoMO predicts future drinking plans (i.e. intentions) and consumption in an ecologically valid setting. The results suggest that fluctuations in FoMO are associated with intentions and consumption, i.e. the acute experience of FoMO is associated with higher drinking intentions and greater consumption, hence highlighting FoMO's validity for predicting drinking behaviour.

Chapter 6

‘Missing the memories you could have made that night’ – How does viewing social drinking scenarios affect young adults feelings of regret?

This chapter presents the results of a study that tested if viewing scenarios, based on previous literature (e.g. Milyavskaya et al., 2018) and on situations that participants in chapters three and four reported experiencing FoMO from, can elicit various forms of regret. After conducting a pilot study to develop and validate test materials, the chapter presents the results of a study that sought to test if FoMO can be experienced without accompanying feelings of regret and/or AR, along with an examination of how context affects FoMO. Regarding contributions for the pilot, I created the materials, conducted the testing and analysis of the results. The results were reported to Richard Cooke, who approved the updates to materials for a larger scale test. For the main study I collected and analysed the data and wrote the manuscript. Richard Cooke provided feedback on the analyses, and all the supervisory team members provided feedback on the completed manuscript. The current format of the chapter has been adapted to match the other chapters, but the content remains the same to the submitted manuscript.

Abstract

Background: Alcohol consumption is a behaviour often performed to achieve social gains (e.g., peer-bonding). Missing opportunities to achieve gains has been linked to a form of regret known as the Fear of Missing out (FoMO). This study tested if viewing vignettes illustrating opportunities to achieve gains induced FoMO, if vignettes portraying alcohol contexts elicit higher FoMO than other contexts and if FoMO can be experienced irrespective of the latent construct regret

Method: 147 adults (78% Female, aged 18-24) were recruited into a study with a mixed-measures design. Participants were randomly allocated to one of three contexts (alcohol, control, non-alcohol). All participants viewed vignettes depicting events in relation to three experience types (comparable, novel, social) before providing ratings of FoMO on a 100-point scale.

Results: Mixed measures ANOVA was performed to test the effect of context, experience, and the interaction term, on FOMO. Significant main effects of context, $F(2, 113) = 39.36, p < .001, \eta_p^2 = .411$, and experience, $F(2, 226) = 10.49, p < .001, \eta_p^2 = .085$, were found; Post-hoc tests revealed FoMO scores were significantly higher (1) in alcohol versus non-alcohol contexts and (2) for social compared to novel and comparable experiences ($p < .001$ for all comparisons). These were qualified by a significant two-way interaction, $F(4, 226) = 6.03, p < .001, \eta_p^2 = .096$. FoMO scores were highest in the alcohol, social vignette.

Discussion: Results suggest FoMO is most keenly felt when missing out on social experiences in alcohol contexts. As FoMO is an entirely psychological phenomenon it may be an apt target for alcohol interventions.

Introduction

Exceeding alcohol guidelines—for example consuming more than 14 units³ per week or drinking 4 to 5 drinks per session—is associated with experiencing negative health and social consequences, such as blackouts or hangovers, or being a victim of violence, in the short term and, in the longer term, increasing the likelihood of developing health conditions such as liver disease and various cancers (Jones et al., 2022; NHS, 2022; , NIAA, 2010). In the UK, young adults aged 16 to 24 years old are the group most likely to exceed alcohol guidelines (ONS, 2018).

One explanation for why young adults exceed alcohol guidelines is that they perceive the social gains associated with alcohol consumption, e.g., increased sociability and social bonding, to be more salient than the negative consequences (Crawford et al., 2020). This association may be so strong that when young adults are unable to attend a drinking event, due to competing demands on their time, they can report experiencing an aversive feeling from missing out (Milyavskaya et al., 2018), an aversive feeling that has been termed the ‘Fear of Missing Out’ (FoMO), and defined as the apprehension that others are having a rewarding experience from which one is absent (Przybylski et al., 2013). In samples of young adults, FoMO has been associated with heavier alcohol use and alcohol-related harm (Riordan et al., 2015, 2019), while qualitative data shows young adults report FoMO to be more aversive than short-term negative health and social consequences (Crawford et al., 2020). There is even evidence that young adults report compensating for missing out on a previous drinking event by consuming greater volumes of alcohol at future drinking events (Crawford et al., 2022b).

While past research has typically treated FoMO as a trait variable (i.e., our propensity to experience FoMO: Riordan et al., 2015, 2019), FoMO can also be considered as a state variable, experienced as a momentary feeling triggered by gaining knowledge of an alternate event (Milyavskaya et al., 2018); for example, you could be at home studying for an exam or at work and receive a notification about a social event, which could prompt a state of FoMO. Crawford et al. (2022b) used ecological momentary assessment to show that FoMO fluctuates over time within individuals and, that experiencing a higher level of FoMO led to increased

³ 1 unit = 8g of pure alcohol

alcohol consumption and higher drinking intentions (i.e., plans to drink in the future, Cooke et al., 2016). This study aims to investigate if it is possible to experimentally manipulate FoMO, something not previously reported in the literature.

FoMO is one of several psychological measures that reflect the latent construct *regret*, a negative emotion experienced when we imagine circumstances would be different if we had acted differently (Zeelenberg & Pieters, 2007). Regret can be experienced from things that happened after we acted (i.e., *action* regret), e.g., regretting a hangover from drinking too much, or from things that happened when we did not act (i.e., *inaction* regret), e.g., regretting a missed opportunity to attend a social event with our friends (Zeelenberg and Pieters, 2007). Action regret has been assessed retrospectively, by asking individuals to report regrets about their action (Trope & Liberman, 2010), and prospectively, by asking participants to report their anticipated regret (AR) - the regret we anticipate experiencing from potential decisions (Richard, de Vries & van der Pligt, 1995). For instance, we could anticipate regretting a hangover if we drink too much alcohol this evening. In contrast, FoMO is a form of inaction regret, reflecting regret from missing out on activities, events or experiences.

Although we believe that AR and FoMO are distinct concepts, they do share some similarities. The affective component of FoMO is like AR; FoMO is experienced as a feeling of uncertainty about potential consequences (Neumann, 2020), which is closely related to the action of AR, in which we anticipate the fallout of poor decision-making (Richard et al., 1995). The cognitive component of FoMO and regret both include counterfactual thinking, wherein we compare our current situation with alternate experiences we deem superior, i.e., we ask ourselves how our circumstances could be different or improved (Neumann, 2020). This has led some to suggest FoMO is a specific, social form of regret and rumination based on reactions to social information (Reagle, 2015). Crawford et al., (2020) support this suggestion. They found students reported experiencing FoMO as a form of inaction regret, over *missing out* on the social gains that can be obtained from social drinking (social confidence, bonding and belongingness).

Despite similarities between FoMO and AR, the current study aims to confirm our contention that FoMO is distinct from AR and other forms of regret in several ways. First, FoMO has a different time orientation to AR and regret: AR is a prospective emotion caused by contemplating *future* decisions; regret is a retrospective emotion based on our *past* experiences; FoMO is experienced in the *present* when we consider our current situation

(Milyavskaya et al., 2018). Second, when thinking about regret, we blame ourselves for making bad decisions (Zeelenberg & Pieters, 2007) while with AR we attach self-blame to making bad decisions in the future. By contrast, FoMO lacks an element of agency - we could learn about an alternative experience occurring when we are already engaged with an activity. In this case, the potential alternative choices were unknown at the time of decision making and hence feelings of self-blame and responsibility should not occur. For example, on our way to a restaurant for a family dinner, we see a queue outside a music venue for an invite only show by one of our favourite bands. In this instance since we did not receive an invite to the show or had prior knowledge of it, there is no past choice to regret. Additionally, as the show will not occur again in the future there is no regret to be anticipated from missing it. Lastly, regret occurs when we realise that another course of action would have improved our circumstances and is experienced when the outcomes of our choices are negative (Zeelenberg & Pieters, 2007). FoMO in contrast has the potential to be experienced when we are engaged with activities, we find pleasurable or enjoyable (Milyavskaya et al. 2018); we could be at a friend's party when we receive a social media post from another friend on a night out. Awareness of the alternative social event may be enough to trigger feelings of FoMO, even though we currently have no negative feelings about our current situation because we are enjoying the party.

This study aimed to investigate if FoMO can be differentiated from AR and regret by presenting participants with vignettes and asking them to report their levels of FoMO, regret and AR with regard to three different experience types: comparable experiences, that provide a similar experience, such as missing out on an alternate party or night out with other peers, novel experiences that provide a unique experience, such as a music concert and social experiences that offer the opportunity for social gains, such as a night out or a party with friends. By testing the three experience types, we are aiming to examine various scenarios where young adults have previously reported experiencing FoMO (Crawford et al., 2020) and to investigate if viewing desirable activities in social settings prompts increased emotion scores. Considerable research shows that alcohol consumption is a social behaviour (de Visser, 2021) and that social influences on consumption are particularly impactful (Clapp & Madden, 2021; Monk & Heim, 2021). This will enable a thorough test compared to examining social experiences only.

Based on the belonging theory of regret, which suggests the context of a regrettable decision drives regret intensity (Morrison et al., 2012), we believe that the context of the vignette is

likely to also affect reported emotion. Specifically, we predict that higher levels of FoMO are likely to be reported when the vignette is in an alcohol context, such as a night out with friends, as opposed to a control context, like helping someone move house, or non-alcohol context, such as a movie-night with friends. Previous findings suggest alcohol-contexts provide younger adults with a greater opportunity to create social bonds compared to other social contexts (de Visser et al., 2013; Frank et al., 2020), hence we propose alcohol-related social contexts may present more to miss out on and may result in greater amounts of FoMO. Furthermore the potentially heightened sense of missing out on the social benefits that can be obtained from attending social events in drinking contexts, may elicit a keener sense of regret, compared to the regret we may experience from other non-social events or non-alcohol contexts (de Visser et al., 2013); hence we are predicting social and alcohol vignettes will result in the greatest amount of regret and AR.

Past research has shown that while AR does not predict alcohol consumption (Cooke & Crawford, 2021; Jones et al., 2020) there is some evidence that FoMO does predict consumption (Crawford et al., 2022b; Riordan et al., 2015,2019). As this is the first study to experimentally manipulate FoMO we wanted to run an exploratory test of the idea that FoMO predicts consumption when it has been manipulated. Specifically, we were interested to see if viewing vignettes in an alcohol context—which we assume will prompt high levels of FoMO—will lead to increased consumption in the future, relative to viewing vignettes located in control and non-alcohol contexts.

Given FoMO's potential to influence future alcohol consumption, it is important to improve understanding of the process. Specifically, we are aiming to differentiate the impact of FoMO on alcohol consumption from the impact of regret and AR, as previous evidence suggests frequently experiencing regrettable consequences does not impact future consumption (Jones et al., 2020). This study will investigate if manipulating FoMO in a series of vignettes, results in participants experiencing significantly higher amounts of FoMO compared to regret and AR, whilst exploring the impact of context and experience. Initially we conducted a pilot study to ascertain if the vignettes can elicit FoMO and subsequently used them to test the following hypotheses.

H1: FoMO scores will be higher than regret or AR scores

H2: Scores for AR, FoMO and regret will all be higher in alcohol contexts vs. other contexts

H3: Scores for AR, FoMO and regret will all be higher for social experiences vs other experiences

H4: Viewing the alcohol context vignettes will increase FoMO scores. This increase will result in higher alcohol consumption at two-week follow-up.

Pilot Study

Background and Aims

The pilot study aimed to test if vignettes designed to prompt FoMO, result in a greater intensity of the sense of missing out compared to control vignettes designed to elicit low levels of FoMO. The use of control vignettes enabled an a priori test to examine if the construct can be experimentally manipulated. In addition the vignettes are designed in a way that should prompt a momentary feeling of FoMO, hence they should not elicit any pre- or post-decisional regret, i.e. the scenarios presented events that are ongoing, thus removing any sense of agency (self-blame) for missing the event (Milyavskaya et al., 2018), therefore it was predicted that FoMO ratings would be significantly greater than regret and AR. To assess FoMO's worth as a viable intervention target, the pilot study aimed to ascertain the intensity of FoMO ratings from missing events in alcohol and non-alcohol contexts. Due to the pro-social role alcohol plays in young adults' social interactions and relationships (de Visser et al., 2013, Dresler & Anderson, 2017), it was predicted that alcohol-contexts would elicit a greater intensity of FoMO compared to non-alcohol and control contexts.

In addition the types of experiences that young adults report missing out on were factored into the vignettes design, informed by empirical evidence (Milyavskaya et al., 2018) and the results of chapters three and four; wherein young adults report experiencing FoMO from missing out on social experiences (e.g. drinking at a party with friends), novel experiences (e.g. attending a concert or festival) and comparable experiences (i.e. when they are engaged in a similar, rewarding experience). I deemed that exploring different types of experiences that young adults report missing out on, can allow us to understand which experiences impact FoMO the most, thus potentially enabling specific tailoring of content in a FoMO alcohol reduction intervention.

In summary the pilot has three main aims; (1) to test if a vignette design can be used to manipulate FoMO; (2) to test if vignettes designed to prompt FoMO results in a greater

intensity of FoMO ratings compared to regret and AR ratings; (3) to test how different contexts for missing out and the types of experiences missed out on, impact ratings of FoMO.

Method

Participants

Twenty-one participants (aged 18 – 26 years old; 62% female) were recruited using an opportunity sample of undergraduate and postgraduate students at the University of Liverpool. Participants were included in the pilot if they responded ‘yes’ to a question asking if they consumed alcohol at least once a week in the invite email and scored between 8 to 19 on the AUDIT, indicating either hazardous or harmful drinking (Saunders et al., 1993).

Design

The pilot used a 3 x 3 repeated measures design. The two factors were context type (alcohol, non-alcohol, control) and experience type (social, novel, comparable). Three forms of regret (anticipated regret; FoMO; regret) were measured as dependent variables.

Materials

FoMO was assessed using an item from Milyavskaya et al., (2018)): “*In this moment, to what extent do you feel like you are missing out on alternative activities and experiences taking place in your environment?*”; 0 = not at all, 100 = very much. Regret items were adapted from anticipated regret items reported by Cooke et al., (2007) with reference to specific scenarios in the vignettes (i.e. missing out whilst at home or work); e.g. “*How much do you regret staying home?*”; 0 = not at all, 100 = very much) and AR e.g. “*How much regret will you experience in the future for staying home?*”? 0 = not at all, 100 = very much).

The 3 x 3 design of the study resulted in the creation of nine vignettes, with separate sets for male and female character references. The vignettes sought to create awareness of unattended events and asked participants to imagine they were engaged with a competing task (i.e. work or study). The scenarios are based on findings from chapters three and four, wherein participants report FoMO is mostly keenly felt when missing out on opportunities to bond with peers via social drinking and from missing novel experiences with peers (e.g. music concerts, festivals). Control vignettes depict common, everyday activities in which the

opportunity for rewarding social experiences should be minimal (e.g. studying in the library). See appendices A to I for the vignette scenarios used in the preliminary test.

Procedure

Data collection took place in September 2021. Participants provided informed consent and completed the screening measure. A link to the vignette survey, created using Qualtrics software, was sent to the participants. After completing the survey, participants were fully debriefed via email.

Data analysis

A repeated-measures ANOVA was performed for each construct to test if self-reports of FoMO are significantly higher for the experimental vignettes (i.e. alcohol and non-alcohol) than the controls. In addition, I expect no differences in regret/AR score between the vignettes.

Results

Table 1 details the mean scores for FoMO, regret, and AR across each of the scenarios.

Table 6.1: Means and SDs for FoMO, Regret and Anticipated Regret by event type

Vignette scenario	FoMO	Regret	AR
Alcohol Social	69.90 (25.25)	57.65 (24.17)	37.77 (23.08)
Non-Alcohol Social	49.75 (26.51)	38.45 (22.73)	29.47 (22.53)
Control Social	7.35 (10.21)	7.70 (9.92)	5.00 (7.00)
Alcohol Novel	82.60 (15.85)	81.95 (18.47)	67.53 (25.41)
Non-Alcohol Novel	38.60 (28.02)	29.70 (27.44)	29.53 (26.82)
Control Novel	32.35 (26.86)	25.60 (22.40)	25.29 (22.31)
Alcohol Comparable	38.55 (24.25)	26.70 (21.49)	26.77 (23.32)
Non-Alcohol Comparable	43.70 (30.35)	40.70 (30.70)	35.06 (26.97)
Control Comparable	9.25 (13.52)	7.60 (12.70)	6.35 (12.05)

The Fear of Missing Out

There was a significant main effect of context on FoMO ratings, $F(2, 38) = 53.37, p < .001, \eta_p^2 = .737$. Contrasts revealed that alcohol contexts ($M = 63.68, SE = 3.98, p < .001$) and non-

alcohol contexts ($M = 44.02$, $SE = 4.86$, $p < .001$) resulted in significantly higher FoMO ratings than control contexts ($M = 16.32$, $SE = 2.73$). In addition alcohol contexts resulted in significantly higher FoMO ratings than the non-alcohol contexts ($p < .001$). Regarding experience type, a significant main effect on FoMO ratings was found, $F(2, 38) = 22.01$, $p < .001$, $\eta_p^2 = .537$. Contrasts revealed that social experiences ($M = 44.33$, $SE = 3.19$, $p = .001$) and novel experiences ($M = 51.18$, $SE = 3.38$, $p < .001$) resulted in significantly higher ratings of FoMO than comparable experiences ($M = 30.50$, $SE = 3.72$). Novel experiences resulted in significantly higher ratings of FoMO than social experiences ($p = .015$). These results suggest the manipulation works as intended, i.e. significantly higher FoMO ratings were elicited from the experimental vignettes compared to the controls. In addition a main effect was found for experience types, hence suggesting experience may influence FoMO ratings in a larger scale test.

A significant interaction between context and experience was found, $F(4, 76) = 11.14$, $p < .001$, $\eta_p^2 = .370$. Contrasts for the *social experiences* revealed that the alcohol context resulted in significantly higher ratings of FoMO than the non-alcohol context ($p = .008$) and the control context ($p < .001$). The non-alcohol context resulted in significantly higher FoMO ratings than the control context ($p < .001$). Contrasts for the *novel experiences* revealed significantly higher FoMO ratings for the alcohol context compared to the non-alcohol ($p < .001$) and control contexts ($p < .001$). There was no significant difference between the non-alcohol and control contexts ($p = .46$). Contrasts for the *comparable experiences* revealed both the alcohol ($p < .001$) and non-alcohol ($p < .001$) contexts resulted in significantly higher FoMO ratings than the control context. There was no significant difference between the alcohol and non-alcohol context ($p = .43$). The results suggest the vignettes work as intended, except for the novel-control vignette. All control vignettes should elicit very low levels of FoMO, while this condition resulted in low to medium ratings.

Regret

There was a significant main effect of context on regret ratings, $F(2, 38) = 42.27$, $p < .001$, $\eta_p^2 = .690$. Contrasts revealed that viewing alcohol contexts ($M = 55.43$, $SE = 3.09$, $p < .001$) and non-alcohol contexts ($M = 36.28$, $SE = 5.13$, $p < .001$) resulted in significantly higher regret ratings than viewing control contexts ($M = 13.63$, $SE = 2.72$). In addition viewing alcohol contexts resulted in significantly higher regret ratings than the non-alcohol contexts ($p < .001$). Regarding experience type, a significant main effect on regret ratings was found, $F(2,$

38) = 25.22, $p < .001$, $\eta_p^2 = .570$. Contrasts revealed that social experiences ($M = 34.60$, $SE = 2.88$, $p = .007$) and novel experiences ($M = 45.75$, $SE = 2.98$, $p < .001$) resulted in significantly higher regret ratings than comparable experiences. Novel experiences resulted in significantly higher ratings of regret than social experiences ($p < .001$). These results for regret suggest the vignettes did not work as intended, i.e. there should be no significant difference in ratings between any of the vignettes for regret scores. The results of the main effects, qualified further analysis into an interaction between the factors, hence enabling an examination of which vignettes needed adjusting.

A significant interaction between context and experience was found, $F(4, 76) = 18.67$, $p < .001$, $\eta_p^2 = .496$. Contrasts for the *social experiences* revealed the alcohol context resulted in significantly higher regret ratings than the non-alcohol context ($p = .016$) and the control context ($p < .001$). The non-alcohol context resulted in significantly higher ratings of regret than the control context ($p < .001$). Contrasts for the *novel experiences* revealed, significantly higher regret ratings for the alcohol context compared to the the non-alcohol context ($p < .001$) and the control ($p < .001$). There was no difference between the non-alcohol and control contexts ($p = .639$). Contrasts for the *comparable experiences*, revealed both the alcohol ($p = .002$) and the non-alcohol ($p < .001$) contexts resulted in significantly higher regret ratings than the control context. The non-alcohol context resulted in significantly higher regret ratings than the alcohol context ($p = .032$). These results suggest only the novel-non alcohol vignette worked as intended in respects to eliciting low levels of regret.

Anticipated Regret

There was a significant main effect of context $F(2, 32) = 27.51$, $p < .001$, $\eta_p^2 = .632$. Contrasts revealed that alcohol contexts ($M = 44.02$, $SE = 3.50$) resulted in significantly higher AR ratings than non-alcohol ($M = 31.35$, $SE = 5.16$, $p = .002$) and control context ($M = 12.22$, $SE = 2.65$, $p < .001$). Non-alcohol contexts resulted in significantly higher regret ratings than control context ($p = .002$). For experience type there was a significant main effect, $F(2, 32) = 17.54$, $p < .001$, $\eta_p^2 = .523$. Contrasts revealed novel experiences ($M = 40.78$, $SE = 3.68$) resulted in significantly higher ratings of regret compared to alcohol ($M = 24.08$, $SE = 3.02$, $p < .001$) and control contexts ($M = 22.73$, $SE = 4.02$, $p < .001$).

A significant interaction between context and experience was found, $F(4, 64) = 6.63$, $p < .001$, $\eta_p^2 = .293$. Contrasts for the *social experiences* revealed that the alcohol context resulted in significantly higher AR ratings compared to the control ($p < .001$), whilst there was no

difference in AR scores between the alcohol and non-alcohol context ($p = .276$). The non-alcohol context resulted in significantly higher AR scores compared to the control context ($p < .001$). Contrasts for the *novel experiences* revealed significantly higher AR ratings for the alcohol context compared to the non-alcohol context ($p < .001$) and the control context ($p < .001$), whilst there was no difference in AR scores between the non-alcohol and control contexts ($p = .639$). Contrasts for the *comparable experiences* revealed both the alcohol ($p < .001$) and non-alcohol context ($p < .001$) resulted in higher AR ratings than the control, whilst there was no significant difference in AR scores between the alcohol and non-alcohol contexts ($p = .184$). These results suggest the AR elicited from the experimental vignettes was too high.

Discussion and Evaluation

Regret and AR

Most of the vignettes (alcohol and non-alcohol) resulted in significantly higher regret and AR scores than the control (expect non-alcohol novel – missing a guest lecture). Based on these preliminary findings it suggests experiencing momentary FoMO may not be distinct from regret and AR. There are a few reasons why these results were found: (1) it may be simply that regret is an intrinsic part of missing out (i.e. to experience the feeling, you need to experience some form of regret), especially in the contexts presented in the scenarios (i.e. social contexts). This may suggest FoMO is a specialised form of regret based on social information (Reagle, 2015). (2) The premise of the scenarios created the right setting for experiencing regret. This could be two-fold; (a) it was not apparent the participants were unaware the alternative events were taking place beforehand, and (b) participants were being invited to attend events, rather than just hearing about them. Extending an invite for an event they cannot attend could have set the scene for experiencing regret/AR. (3) Finally the benefits or reward for engaging in the current activity may not have been salient enough to override feelings of regret and anticipated regret.

If reason (1) is the case then we should expect similar results in the main study, regardless of any updates made. However taking points (2) and (3) into consideration the vignettes should be updated. To make the benefit/reward of the current activity more salient, the activities need to have more value or be more significant to the individual (i.e. more to lose/gain from not engaging/engaging with them). This potentially should reduce feeling regret or

anticipating it in the future. In addition the wording should be more explicit in regard to highlighting that participants are unaware of the current alternative activities, plus the removal of any invites to attend events. Considering these suggestions the experimental vignettes were updated, see appendices K to P (the appendices include the female reference vignettes only)

FoMO

All the experimental scenarios (alcohol and non-alcohol) resulted in moderate to high FoMO scores and were significantly higher than most of the control scenarios, suggesting the scenarios presented are sufficient to instil feelings of FoMO. However this was not the case for the novel event control condition, low to moderate FoMO scores were recorded. This suggests the novel event depicted in the scenario needs updating, whereby a lower level of FoMO would be experienced. The current novel event control scenario depicts missing out on a business conference. The novel-control vignette was updated and re-piloted (See appendix Q). It was deemed necessary to repilot this vignette as the primary aim of the pilot was to ensure FoMO can be experimentally manipulated.

The updated vignette was re-piloted, and 20 participants responded to the request for a further survey. Results indicated that low amounts of FoMO and regret were elicited from the updated version; FoMO, $M = 7.90$ ($SD = 6.06$), Regret = 3.25 ($SD = 3.13$) and AR = 2.90 ($SD = 3.06$), hence this version was retained for the larger experimental test.

Summary

The pilot study aimed to test vignettes to assess if perceptions of missing out can be manipulated experimentally. The results suggest the presented vignettes, particularly the alcohol-related scenarios resulted in moderate to high levels of FoMO, hence demonstrating their feasibility for a larger experimental test. The next section presents the main study in full.

Main Study

Method

Participants

Two-hundred and three adults aged 18-24 were recruited into the study from a university in Northwest England. Inclusion criteria were: (1) drinking alcohol at least once a week and (2) scoring below 20 on the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993). As the focus of the present study was on social drinkers, potential participants who scored 20+ on the AUDIT were excluded because such a score indicates possible dependence. Following recruitment, 27 participants were excluded as they recorded drinking zero units of alcohol in the two weeks prior to the study, 23 participants were excluded as they failed to complete the screening measures, and six participants were excluded as they scored 20+ on the AUDIT; they were advised to consider contacting their GP or the UK alcohol charity Drinkline if they were worried about their current patterns of consumption.

After exclusions, the final sample comprised 147 participants (78% Female (n = 116); Mean Age = 19.44 (SD = 3.37); Mean AUDIT score = 10.39 (SD = 5.04)). One-hundred and nineteen participants responded to the two-week follow up, however, 31 participants were excluded from analyses for one of three reasons: 19 could not be matched to responses from the first part of the study, 12 partially completed the assessment, and there was one duplicate response. This left a sample of 87 for the follow-up analysis (Female = 80.5%, n = 70).

Design

The study used a 3 x 3 x 3 mixed measures design. The independent groups factor is context type (alcohol-related, control, non-alcohol). The repeated measures factors are experience type (comparable, novel, social) and emotion (AR, FoMO, regret). A priori power analysis conducted in GPower 3.1 recommended a sample size of 141 for such a design. As we recruited 147 participants, we believe the study was sufficiently powered. For the follow-up analysis, the independent variable is context type, and the dependent variable is alcohol consumption.

Materials

Screening measures

The timeline follow-back method (TLFB; Sobell & Sobell, 1992) asks individuals to provide retrospective estimates of their daily drinking over a specified time period (in our case the previous two weeks) using a calendar with memorable dates noted as prompts. To aid individuals in recording their drinking, the measure was adapted to include images of UK relevant drink measures. The TLFB has been shown to have excellent reliability when self-administered via computer (Sobell et al., 1996). The AUDIT is a 10-item tool developed by the World Health Organisation to screen for alcohol use disorders (Saunders et al., 1993). The AUDIT is scored from 0 to 40, with 0-7 indicating low-risk drinking, 8-15 indicating hazardous drinking, 16-19 harmful drinking and 20+ indicating possible dependence (Saunders et al., 1993). The AUDIT has been shown to have excellent reliability in student populations (Campo-Arias et al., 2013).

Vignettes

We developed nine vignettes, crossing three *context types* (alcohol-related, control, non-alcohol related), with three *experience types* (comparable, novel, social). Participants are asked to imagine they were completing a task—either studying or working—which caused them to miss the event. All vignettes depicted alternative activities (e.g., studying or working) which are usually concurrent to missed events (Milyavskaya et al., 2018). Vignettes were based on situations where young adults have reported experiencing FoMO in our past research (e.g., missing a social drinking event with friends or a non-drinking social event: Crawford et al., 2020; Crawford et al., 2022b). Control vignettes depicted situations where FoMO was unlikely to occur (e.g., helping someone to move house). To ensure the vignettes manipulated FoMO levels as intended, we conducted a pilot study (N = 21) where participants viewed the vignettes before reporting their FoMO levels on a scale from 0-100 (0 – no FoMO, 100 – extreme FoMO). Results from the pilot study suggested all vignettes worked as intended, except the novel-control condition, which had low to medium amounts of FoMO (M = 31.76, SD = 26.32). This was updated and re-piloted, resulting in very low FoMO scores (M = 7.90, SD = 6.06).

FoMO, Regret and Anticipated Regret Items

FoMO and Regret were assessed using items from Milyavskaya et al. (2018): FoMO was measured using the item “*In this moment, to what extent do you feel like you are missing out on alternative activities and experiences taking place in your environment?*”; Regret was assessed using the item “*How much do you regret staying home?*”. AR was assessed using an item reported by Cooke et al., (2007), e.g. “*How much regret will you experience in the future for staying home?*”? All items were adapted from a 7-point scale to 0-100 (0 – No FoMO/Regret/AR to 100 Extreme FoMO/Regret/AR) scale; this was done to provide the participants with the opportunity to record a greater range of emotion intensity.

Procedure

The study was granted favourable ethical review from the host university’s ethics committee. Data collection ran from September 2021 to October 2021, launching after UK national COVID-19 lockdown restrictions were eased. All data collection took place online using questionnaires administered via Qualtrics. Participants provided informed consent before completing the screening measures. After screening, participants were randomly assigned to one of the three scenarios. They were asked to read the scenarios and imagine they were completing a task which caused them to miss the event, and then to rate how much AR, FoMO and regret they would experience. Participants were followed up two weeks later and asked to complete another TLFB to record their alcohol consumption covering the two weeks since they viewed the vignettes. At the end of the study, participants were fully debriefed via email and reminded of their right to withdraw from the study.

Data analysis

A mixed measures ANOVA was used to test if the independent groups effect of context type and repeated measures effects of emotion and experience type, answering Hypotheses 1-3. A mixed-ANOVA was selected as this enabled a simultaneous comparison of the three separate means for each factor and facilitated the exploration of how the factors interacted. This analysis was chosen in place of other analyses such as a MANOVA as this type of analysis explores how changes within independent variables affect the outcomes and hence not applicable to the study design.

Interactions between factors were decomposed using the LMATRIX and MMATRIX SPSS subcommands reported by Howell and Lacroix (2012). The LMATRIX subcommand enables

decomposing of interactions for between subjects factors and the MMATRIX enables decomposing of within subjects factors interactions (Howell & Lacroix, 2012). To address Hypothesis 4, a mixed measures ANOVA was run with context type as the independent groups factor and time as the repeated measures factor.

Results

Mixed measures ANOVA was used to test effects of context type, emotion, and experience type. The main effect of emotion was large-sized ($F(2, 226) = 68.46, p < .001, \eta_p^2 = .377$); participants reported significantly higher FoMO scores compared to AR ($p < .001$) and regret ($p < .001$), whilst significantly higher regret scores were reported compared to AR ($p = .039$). The main effect of context type was also large-sized, ($F(2, 113) = 39.36, p < .001, \eta_p^2 = .411$); significantly higher scores were reported in the alcohol ($p < .001$) and non-alcohol context conditions ($p < .001$) than the control condition. There was no difference between the alcohol and non-alcohol conditions ($p = .245$). The main effect of experience type was medium-sized, ($F(2, 226) = 10.49, p < .001, \eta_p^2 = .085$); significantly higher scores were reported for social experiences compared to comparable, ($p < .001$), however there was no significant difference between social and novel types ($p = .103$). In addition, significantly higher scores were reported for the novel type compared to the comparable type ($p = .035$). Table 1 highlights the scores for each of the factor levels.

Table 6.2: FoMO, Regret and Anticipated Regret scores for scenarios

	Alcohol			Non-alcohol			Control		
Factor	Social	Novel	Comparable	Social	Novel	Comparable	Social	Novel	Comparable
FoMO	M = 66.52	M = 48.39	M = 37.25	M = 45.28	M = 40.15	M = 34.53	M = 6.68	M = 12.68	M = 4.94
	SD = 25.70	SD = 25.66	SD = 24.88	(21.68)	(35.00)	(26.03)	(22.15)	(21.78)	(14.58)
	Median = 72.50	Median = 42.50	Median = 30.00	Median = 49.00 (IQR = 28)	Median = 72.50 (IQR = 50)	Median = 30.00 (IQR = 36)	Median = 0.00 (IQR = 1)	Median = 5.00 (IQR = 16)	Median = 0.00 (IQR = 1)
	IQR = 47	IQR = 42	IQR = 35						
Regret	M = 43.78	M = 27.71	M = 18.51	M = 32.26	M = 26.63	M = 22.83	M = 2.83	M = 10.57	M = 2.54
	(26.70)	(23.52)	(18.63)	(23.74)	(23.75)	(26.24)	(9.76)	(20.51)	(10.32)
	Median = 50.00 (IQR = 48)	Median = 20.00 (IQR = 23)	Median = 20.00 (IQR = 23)	Median = 20.00 (IQR = 50)	Median = 20.00 (IQR = 28)	Median = 13.00 (IQR = 27)	Median = 0.00 (IQR = 0.0)	Median = 1.00 (IQR = 12)	Median = 0.00 (IQR = 1)
AR	M = 35.61	M = 26.45	M = 21.48	M = 28.08	M = 22.83	M = 22.75	M = 5.62	M = 8.26	M = 4.00
	(26.98)	(20.03)	(23.63)	(24.79)	(26.24)	(22.92)	(17.29)	(19.64)	(12.87)
	Median = 35.00 (IQR = 39)	Median = 20.00 (IQR = 35)	Median = 10.00 (IQR = 34)	Median = 29 (IQR = 43)	Median = 13.00 (IQR = 27)	Median = 16.00 (IQR = 34)	Median = 0.00 (IQR = 1)	Median = 0.0 (IQR = 4)	Median = 0.0 (IQR = 1)

All three two-way interactions were significant. The context by emotion interaction was large-sized ($F(4, 226) = 15.05, p < .001, \eta_p^2 = .210$). Decomposing the interaction shows that while participants in the alcohol and non-alcohol contexts reported significantly higher FoMO scores than regret ($p < .001$) or AR ($p < .001$), there was no significant difference between FoMO and regret ($p = .234$) nor FoMO and AR ($p = .374$) for participants in the control condition. The context by experience interaction was medium-sized, ($F(4, 226) = 6.03, p < .001, \eta_p^2 = .096$). For the alcohol context, significantly higher scores were recorded for the social experience compared to novel ($p < .001$) and comparable ($p < .001$), whilst there was no significant difference between the novel and comparable types ($p = .072$). There was no significant differences between the experience types for both the non-alcohol and control contexts. A small-sized interaction between emotion and experience was also found, ($F(3.89, 439.22) = 3.70, p = .006, \eta_p^2 = .032$). For social experiences, participants reported significantly higher FoMO scores compared to regret ($p < .001$) and AR ($p < .001$). For novel experiences, participants reported significantly higher levels of FoMO compared to regret ($p < .001$) and AR ($p < .001$). For comparable experiences, participants reported significantly higher levels of FoMO compared to regret ($p < .001$) and AR ($p < .001$).

The three-way interaction between context, emotion, and experience was also significant, ($F(8, 452) = 2.51, p = .011, \eta_p^2 = .042$). Post-hoc comparisons revealed FoMO scores were highest for participants assigned to the alcohol context condition when they viewed social experiences (see Figure 6.1). Scores were significantly different from novel ($p = .029, \eta_p^2 = .042$) and comparable ($p = .004, \eta_p^2 = .072$). In addition, FoMO scores were significantly higher in the alcohol context compared to the control, when viewing social experiences compared to novel ($p < .001, \eta_p^2 = .111$) and comparable ($p < .001, \eta_p^2 = .134$).

Figure 6.1: The Interaction of Context and Experience on FoMO

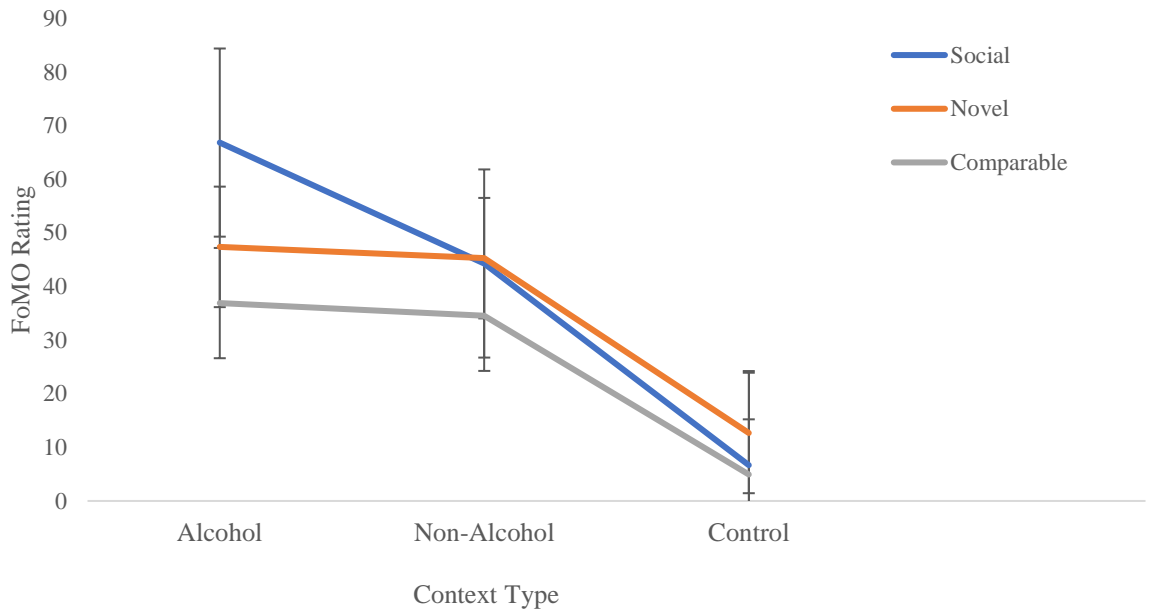
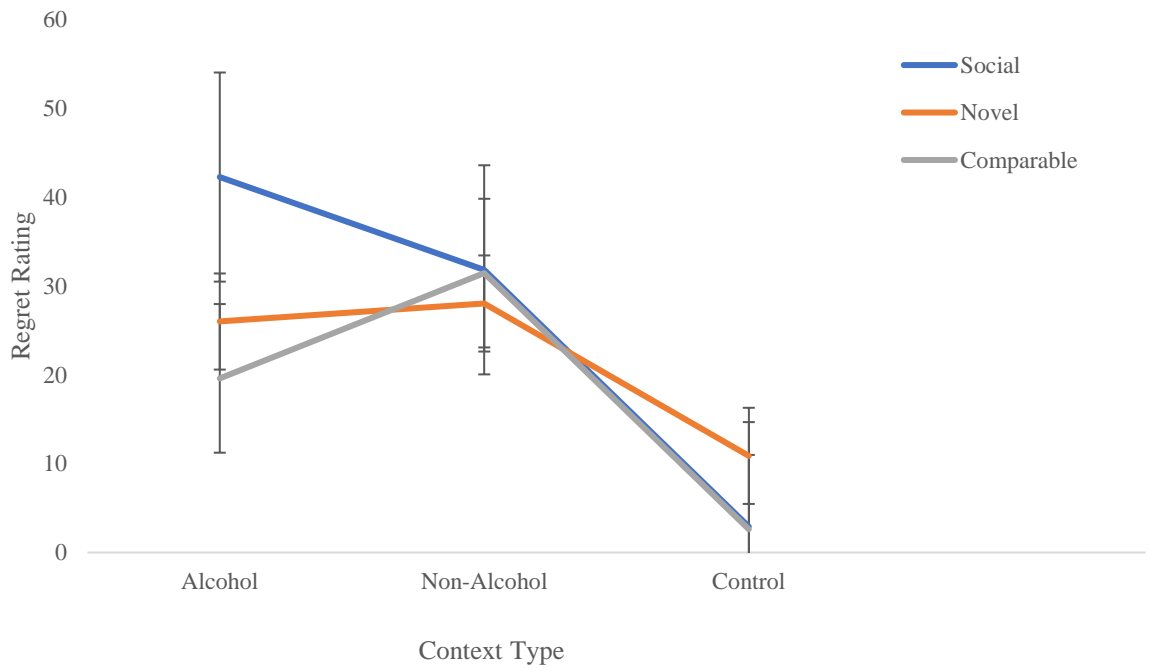
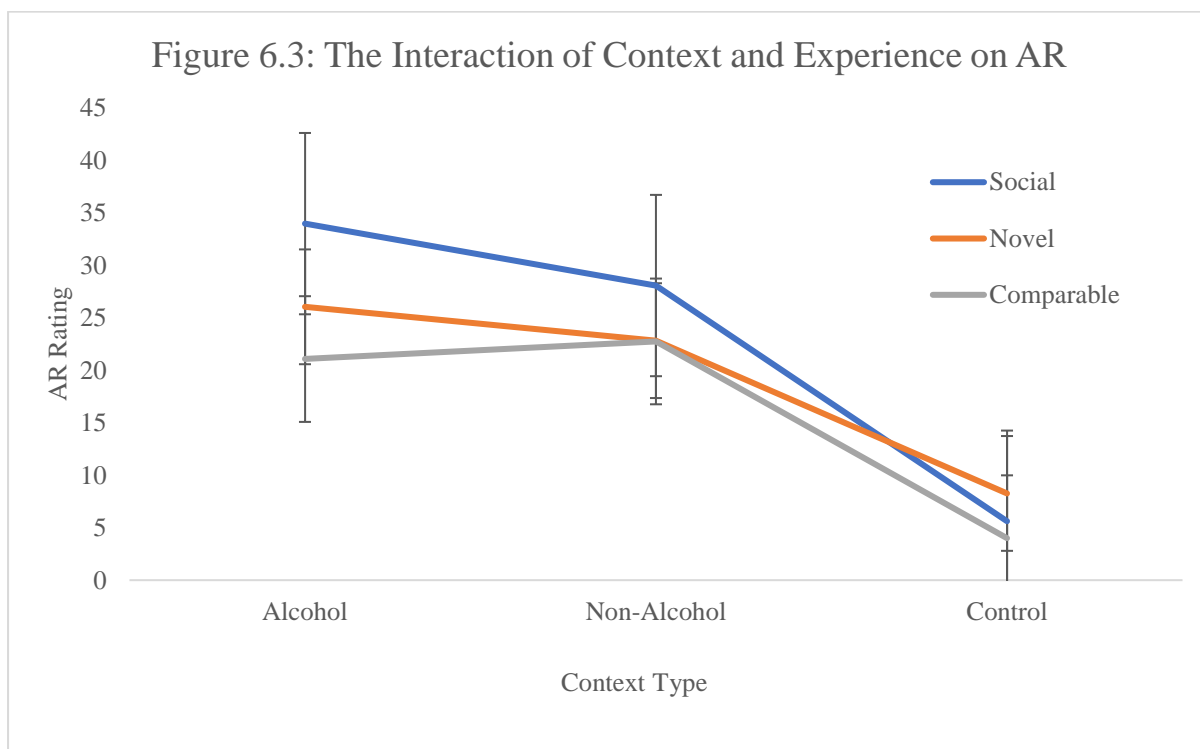


Figure 6.2: The Interaction of Context and Experience on Regret





Follow-Up Analysis

Average alcohol consumption (in UK units) in the two weeks prior to the study was: week one, $M = 15.40$ ($SD = 13.61$), week two, $M = 14.84$ ($SD = 12.75$) and total two-week average was, $M = 30.44$ ($SD = 24.03$). Average alcohol consumption at follow-up was, week one $M = 13.64$ ($SD = 14.94$), week two $M = 10.40$ ($SD = 11.17$) and total two-week average $M = 24.04$ ($SD = 24.69$). Table 2 highlights pre and post experiment consumption by context type. Mixed measures ANOVA, with context as the independent groups factor and time as the repeated measures factor, highlighted that neither the main effect of time, $F(1, 84) = 2.47, p = .12, \eta_p^2 = .029$ nor the main effect of context, $F(2, 84) = .99, p = .38, \eta_p^2 = .023$ were significant. The time by context interaction was also non-significant, $F(2, 84) = 1.07, p = .35, \eta_p^2 = .025$. This means that viewing the alcohol context vignettes did not lead to increased alcohol consumption at follow-up relative to viewing non-alcohol or control vignettes. Instead, viewing the alcohol (or control) vignettes was associated with lower consumption at follow-up, although this was a small effect size difference.

Table 6.3: Alcohol consumption in units by Context

Context	Pre-Consumption	Post-Consumption	Effect size difference
Alcohol	26.06 (SD = 19.75)	20.34 (SD = 18.31)	$d = -.28$
Non-Alcohol	30.54 (SD = 25.91)	30.70 (SD = 32.84)	$d = .02$
Control	24.38 (SD = 25.62)	21.95 (SD = 21.51)	$d = -.19$

Discussion

The current study used a series of vignettes to test the possibility that FoMO can be differentiated from regret and AR. As predicted, we found that FoMO was distinct to other forms of regret. Vignettes were designed in such a way to test the idea that contextual and situational factors could influence the intensity of FoMO. We were unable to support our hypothesis that viewing alcohol contexts would prompt higher levels of emotion than viewing non-alcohol and control context, nor were we able to show that social events prompted higher levels of emotion than comparable or novel events. However, it's possible that these effects were not found because of our novel finding that FoMO levels were highest in a combination of these factor levels, social events in alcoholic contexts. This suggests FoMO may be more pronounced when opportunities for social gains in alcohol-related contexts are missed. While our experimental manipulations largely generated expected effects, there was no effect of viewing the alcohol-related vignettes on subsequent consumption.

Results from the current study show that FoMO scores were significantly higher than regret and AR scores. Our participants may have reported greater amounts of FoMO due to the time orientation of the study manipulation, i.e., in the moment, which suggests that the experience of FoMO is a reaction to social information, resulting in a form of social regret and rumination (Reagle, 2015). This novel finding was not possible to observe in past research studies because FoMO was measured either retrospectively (Riordan et al., 2015) or prospectively (Riordan et al., 2019).

One consequence of measuring FoMO in the moment is that the agency attached to self-blame from poor decision making may have been diminished, i.e., there was no bad decision to be regretted either retrospectively or prospectively. This suggests the regret and/or the AR

attached to the experience of FoMO can potentially be ameliorated by removing the element of agency. This is an important conceptual finding because it suggests FoMO may be a discrete aspect of the latent construct regret, separate of regret and AR as it can be experienced without or at least with low levels of these related emotions. Further research is needed to confirm how regret and AR interact with FoMO.

In contrast to our predictions, current results suggest that both alcohol and non-alcohol contexts resulted in higher emotional scores compared to the control context. While this highlights that we were able to manipulate emotional responses, it fails support the prediction that alcohol contexts would result in greatest amounts of reported emotion. In addition, current results also failed to support our prediction that social experiences would result in the greatest amount of reported emotion. Nevertheless, the failure to confirm these effects is undercut with excitement at our unexpected finding that the combination of alcohol context and social experience triggered the highest levels of FoMO, regret and AR.

The focus of our fourth hypothesis was to examine if viewing alcohol context vignettes, which we found increased FoMO, regret and AR levels, would influence subsequent consumption relative to viewing non-alcohol or control vignettes. The results indicated that viewing the alcohol context vignettes did not influence consumption reported by participants in the way that we expected, i.e., increasing consumption in response to greater FoMO. While this finding contrasts with survey evidence suggesting FoMO predicts consumption (Crawford et al., 2022; Riordan et al., 2015, 2019), our results could be due to methodological differences in how studies were conducted, in particular, how frequently FoMO was measured. For example Crawford et al. (2022) used a longitudinal sampling method that measured fluctuations of FoMO several times a day over the course of three weekends. In contrast the current study manipulated FoMO once and hence this may not have been enough to impact consumption over a longer period, especially considering the wide variety of population and individual-level factors that influence alcohol consumption (see Sudhinaraset et al., 2016 for a review). It is entirely possible that manipulating FoMO as we did in this study does not lead to long-lasting effects on the participant, although our current study design does not allow us to confirm or disconfirm this proposal. A study where participants completed a momentary assessment of FoMO levels over time, prior to receiving an experimental manipulation, followed by a period of observation of FoMO levels over time, would be one way to address this issue.

This is the first study to manipulate FoMO experimentally with regard to alcohol consumption and provides evidence for the suggestion that alcohol-related FoMO is distinct from alcohol-related regret and AR. To our knowledge this is the first quantitative result that suggests that alcohol related FoMO may be a distinct FoMO experience, supporting previous qualitative findings which suggest young adults report experiencing FoMO from missing opportunities to drink in social settings (Crawford et al., 2020). Furthermore, current results indicate that FoMO was most pronounced in response to viewing vignettes comprising social experiences in alcohol contexts. This novel finding can potentially be explained by de Visser et al. (2013), who report consuming alcohol in a social setting provides a greater opportunity to create social bonds than engaging with other social activities. de Visser et al. (2013) suggest alcohol plays a positive social role in enabling individuals to lower inhibitions and enhance the social bonding process. These findings may explain why our participants' FoMO was most pronounced in the combination of alcohol contexts and social experiences, as these types of scenarios may afford the greatest opportunity to bond with peers, hence presenting the most to miss out on.

The results of the current study present opportunities for future research, such as examining the interplay of FoMO with different negative emotions such as regret and/or AR. A study could potentially examine how these emotions influence each other overtime i.e., does the experience of one emotion augment or blunt the subsequent emotion, and if this in turn affects perceptions of drinking and consumption. In addition, the findings suggest that FoMO is most keenly felt when missing out on social events located in alcohol contexts, and that feelings of FoMO can be manipulated. Considering these findings, and given that FoMO is completely psychologically, it may be a potential target for future alcohol interventions. For example, an intervention could target and counter the behavioural beliefs underlying FoMO. Such an intervention could conduct a priori analysis to ascertain what the underlying beliefs are and then target them. The intervention could be delivered using an ecological momentary technique that encompasses delivering the intervention at times when FoMO is most likely to be experienced, e.g. evenings and weekends, on an accessible platform such as a smartphone. This would enable targeted messages to be delivered to participants in ecologically valid settings (Heron & Smyth, 2010; Riordan et al., 2015).

The current study has several strengths, such as conducting a pilot study to ensure the efficacy of the manipulation, using an experimental manipulation to demonstrate that FoMO can be manipulated, that alcohol-related FoMO may be a distinct FoMO experience and that

FoMO may be a distinct from other forms of regret. However, the study does have some limitations; the sample mostly comprised female participants, suggesting the results may only be generalisable to young adult females; however Rozgonjuk et al. (2021) report no gender differences in FoMO. A further study could be conducted with a more gender balanced sample, to examine if gender specifically impacts alcohol-related FoMO. Another limitation is the results are only generalisable to UK university students, to counter this a further study could be conducted across various nations to ascertain if cultural factors impact alcohol-related FoMO, or a study could use non-student samples.

To conclude, the current study demonstrated that 1) FoMO can be experimentally manipulated; 2) greater levels of FoMO are experienced when missing out on social events located in alcohol contexts; and 3) that FoMO may be a distinct form of the latent construct regret, separate from regret and AR. These findings provide important information to improve conceptual understanding of the nature of FoMO. By gaining a deeper knowledge of the construct we can further our understanding of factors that influence young adults' drinking behaviour.

Chapter Summary

This chapter contributed to the aims of the thesis by manipulating FoMO in an experiment to show that FoMO as a momentary feeling can be experienced without, or at least very little feelings of the associated construct regret. In addition the chapter demonstrates the contexts in which FoMO is most keenly experienced, highlighting that missing alcohol-related social events results in higher levels of FoMO; taking these results, along with the ability to manipulate of the construct, it suggests that FoMO may be a modifiable target in an alcohol intervention. Nonetheless eliciting FoMO in the experiment did not impact consumption at follow-up, contrasting with results from chapter five suggesting FoMO may have predictive validity for alcohol consumption. This discrepancy is further discussed in the following chapter.

Chapter 7

General Discussion

The current thesis had a primary aim of investigating why experiences of alcohol-related regrets fails to inform future drinking plans and consumption (Epler et al., 2015; Jones et al., 2020). The thesis highlights that because post-consumption regrets are an established and expected part of a drinking episode, they do not readily influence future drinking plans or consumption. The secondary aim of the thesis was to explore if young adults' experience inaction regret from missing out on opportunities to consume alcohol. Results suggest inaction regret is experienced in the form of the Fear of Missing Out (FoMO), which provides aversive motivation for future consumption. In contrast to the action regrets that follow excessive drinking, participants reported, inaction regrets were viewed as more unpleasant – missing out is more impactful than suffering consequences. The underlying belief driving FoMO is the perception of missing out on opportunities to bond with peers and a resulting worry of being socially isolated; suggesting FoMO may be a specific form of social anxiety. Having provided an explanation for why traditional measures of action regret (e.g., anticipated regret) rarely predict alcohol consumption, the third aim of the thesis was to test the idea that FoMO might predict consumption. Using EMA, I was able to show that FoMO predicted consumption and drinking intentions. The final aim of the thesis was to see if FoMO could be experimentally manipulated using vignettes. I found that it was possible to manipulate FoMO levels, which were particularly high when vignettes depicted missing out on social experiences in an alcohol context. These findings raise important considerations about how FoMO relates to alcohol intentions and consumption and suggest that it might be possible to target FoMO in an alcohol intervention to reduce heavy drinking episodes. The current chapter summarises the main findings of each thesis study and then discussing results in relation to previous theories of regret and the broader research literature, ending with a discussion on the feasibility of a FoMO-based alcohol intervention.

Summary of main findings

Chapter three was a qualitative study into the lived experiences of alcohol-related regret. I used the qualitative methodological approach, 'Interpretative Phenomenological Analysis' (IPA) to explore how young adults make sense of their regrettable drinking experiences, in

relation to how such instances influence their perceptions of risk for future consumption. The findings highlight how the experience of regret post consumption is a normalised and established part of the drinking ritual; the experiences of regret are the indemnity for the associated benefits of alcohol consumption. Nevertheless experiences of serious regrets such as violence, injury and drink-spiking had a profound impact on perceptions of risk, resulting in a transformative experience in which participants self-assessed abilities and failings to direct future consumption and drinking practices. Hence, regret may impact risk appraisals if consequences are perceived as dire, however such experiences were isolated incidents, meaning that only rarely did regrets influence risk perceptions. Additionally a gender bias for experiencing regrets was apparent; females engaging with risk behaviour were perceived to be at fault for subsequent consequences, whereas males experiencing similar consequences were celebrated for their behaviour. This may explain why young women report experiencing more alcohol-related regrets than young men. A key finding from the chapter was that young adults report experiencing inaction regret in the form of FoMO from missing opportunities to drink socially. The experience of post-consumption consequences was perceived as preferable to experiencing FoMO from missing out on the drinking events - the social benefits of collective drinking outweigh the action regrets that follow. This finding suggests FoMO may provide an aversive form of motivation to attend future drinking events and driving future consumption.

Chapter four sought to explore lived experiences of alcohol-related FoMO in greater depth. IPA was used to investigate how young adults make sense of missing out from attending alcohol-related events, specifically how missing out shapes perceptions of their social worlds and if the experience leads to coping behaviours. The results of the study provide insight into the underlying belief for the sense of missing out in alcohol-related contexts; young adults perceive that consuming alcohol socially leads to the formation of shared memories that are used to construct and deepen social bonds and identities. Missing out on shared memories resulted in participants self-isolating from their peers, perceiving themselves as outsiders to social interactions; hence driving their sense of missing out. This led to states of worry, fear, and anxiety specifically in relation to positions within social groups, suggesting FoMO may be a specific form of social anxiety. To cope with the aversive states, young adults reported using both approach and avoidance strategies. Cognitive reappraisal was used to judge the relative merit of the missed event, through contrasting perceptions of missing out with the realities of engaging with excessive consumption during the event. This resulted in an

appraisal of being spared the negative consequences of drinking too much, such as hangovers and wasting money. Alternatively, avoidance behaviours were used to offset the negative affect caused by missing out, such as drinking more than usual at the next event. This offsetting behaviour was driven by the perception of increased volumes of alcohol leading to greater disinhibited behaviour and subsequent memorable acts that become more salient to the group identity than the memories created during the missed event. This finding further suggests that experiencing FoMO may drive future consumption.

Chapter five sought to build on previous research that established links between single measures of FoMO and drinking behaviours (Riordan et al., 2015; 2019), by exploring how FoMO experienced in the real world influenced future drinking plans (i.e., intentions) and consumption behaviour, using EMA. The study aimed to investigate if fluctuations in FoMO levels predicted consumption and drinking intentions. It was hypothesised that experiencing higher amounts of FoMO would result in higher intentions to drink and greater amounts of consumed alcohol. The findings highlighted how increased levels of FoMO were predictive of greater drinking intentions and greater alcohol consumption, albeit the effect observed on consumption was relatively small compared to intention. This finding can be a result of the gap between intention and behavioural performance (Webb & Sheeran, 2006), specifically impacted by the timing of the data collection, i.e., during the UK's lockdown measures in response to the COVID-19 pandemic, in which opportunities to drink socially were limited. Nonetheless the fact that the models were able to find associations between both FoMO, drinking intentions and consumption in restricted conditions, suggests FoMO may have a pervasive influence on drinking that may be even more pronounced in 'normal' conditions.

Finally, chapter 6 sought to create and test vignettes for an experimental manipulation of FoMO. The vignettes depicted scenarios in which participants in chapters three and four discussed experiencing FoMO. To enable a test of the manipulation, control vignettes were created, which represented everyday experiences that were unlikely to elicit feelings of FoMO and regret. The vignettes were tested using a pilot sample, with results highlighting how the vignettes performed in relation to eliciting FoMO and regret. Based on the pilot results the vignettes and follow-up questions were refined before use in the main study. Chapter six provided an experimental test of the vignettes created, with the aims of: (1) examining if FoMO can be manipulated to be experienced without accompanying feelings of regret; (2) in which contexts FoMO is most keenly experienced; (3) if experiencing FoMO from the vignettes impacted alcohol consumption at a two-week follow-up. The results

suggest that experiencing FoMO as a momentary feeling may be distinct from the latent construct regret; hence highlighting an important conceptual finding. Furthermore, results indicated that FoMO levels were greatest when imagining missing out on alcohol-related social events. This result support previous qualitative findings suggesting that consuming alcohol in a social setting provides greater opportunities to bond than other activities (de Visser et al., 2013), hence non-attendance at such events may present the most to miss out on. Lastly the results show that FoMO elicited by the vignettes failed to influence consumption at the two-week follow-up. This finding contrasts with the results of chapter five, which suggests FoMO has predictive validity for drinking behaviours. The disparity between the findings could be due to the single elicitation of FoMO from the vignette, i.e., a single momentary feeling of FoMO may have not been enough to impact drinking over a longer period. In contrast the EMA study assessed within-person fluctuations over a longer period, and hence was able to assess how momentary FoMO directly impacted drinking behaviours in a real-time and in the real-world, compared to a hypothetical sense of FoMO generated from the vignette. In the next section, I link findings to theories of regret outlined in Chapter One.

Contributions to regret theory development and refinement

The results of the thesis can be interpreted in relation to theories of regret that outline what drives regret intensity. For example the temporal theory of regret suggests regret intensity is driven by the nature of our regrettable decision, i.e. our action or inaction. Regret subsequent of our inaction is deemed as more intense with time, whereas regret from our actions lessens with time (Gilovich & Medvec, 1994, 1995). The results of chapter three support this notion, the participants deemed that the action regrets experienced from drinking too much alcohol (e.g. social embarrassment, hangovers, wasting money) were preferable to experiencing inaction regret (i.e. FoMO) from missing opportunities to drink socially. It may be the case that the participants perceived that they were able to better deal with their action regrets, for example rationalising that such acts are an expected part of a drinking episode. Conversely, they may have perceived they were unable to act to rectify their inaction regret (i.e. FoMO) from missing drinking events. With time action regrets may lessen in intensity; evidence from the young adult alcohol literature highlights how action regret may lessen with time. For example, regrettable drunken actions are often used by young adults to create ‘drinking stories’ that are rationalised and re-interpreted as something positive, which in turn helps to create a shared narrative that binds groups together (Dresler & Anderson, 2017; Lyons et al., 2018; de Visser et al., 2013). In contrast the inaction regret experienced from missing events

may increase with time; participants highlighted how they were unable to act when narratives of missed events were being discussed by their peers, resulting in them experiencing social isolation. Hence the initial regret at missing out may have been exacerbated with time.

Alternatively, the results of chapter four draw support for the decision-justification theory, which suggests regret is driven by the underlying belief about the consequences from making a decision i.e. regret is more intense if the outcome from our decision results in a worse set of outcomes than the alternative choices. Furthermore the theory suggests how keenly we experience the regret is dependent on how justifiable we deem our actions (Connolly & Zeelenberg, 2002). One of the participants in chapter four rationalised that her regret over missing out on a friend's birthday party was lessened by justifying her decision not to attend. In her justification, she appraised that by missing out she was spared the negative consequences of drinking too much, i.e. social embarrassment, the hangover and wasting her money. This example highlights how comparing the outcomes of decisions and by justifying our choice based on the outcome, feelings of regret are lessened.

Finally the thesis results also support notions of regret intensity outlined by the belonging theory of regret, which suggests that the context of the regrettable decision drive the intensity, in particular domains related to our sense of social belonging (Morrison et al., 2012). The results of chapter six highlight how different context influenced ratings of FoMO, in particular the results suggest FoMO is most keenly felt when missing out on alcohol-related social events. This may be due the role alcohol consumption plays in forming social groups and identities but also that it is perceived to help form closer social bonds than other social activities (de Visser, 2013; Dresler & Anderson, 2017). Therefore missing out on these opportunities to bond may place a greater threat to our sense of belonging, in turn resulting more intense feelings of missing out.

Contributions to the research area

The current thesis provides insight into why experiencing action regret fails to inform future drinking decisions and also offers some novel findings regarding alcohol and FoMO. Below I outline how my research adds to the topic of regret and alcohol.

Regret and risk appraisal

Chapter three explored lived experiences of alcohol-related regret, which revealed the underlying beliefs of how such experiences influence attitudes and shape perceptions of risk. The results highlight how young adults make sense of their regrets; engaging with regrettable acts are perceived as normative behaviour for their particular social groups, hence, regret post-consumption is judged to be an established and expected part of the drinking ritual, perceived as the indemnity for obtaining the benefits of consumption. These beliefs highlight how regret fails to affect future consumption; rarely did participants reflect on how their experiences increased perceptions of susceptibility to the risks, the severity of risks or how they heightened fear of the risks. Participants rarely reported that these experiences persuaded them to reduce future consumption – this only occurred when participants experienced uncommon, extreme experiences. The most reported regrets did not meet this threshold.

The findings highlight an important consideration for the decision-making process that young adults engage in when deciding to drink, suggesting that action regret and other risk appraisals may not influence drinking decisions but rather they may be based on a cost-benefit analysis of potential social gains (e.g. making or reinforcing friendships) vs social losses (e.g. socially embarrassing yourself). This contrasts with expectancy-value models of health behaviour which suggest health behaviour is motivated by judgements of risk for adverse health consequences, i.e., feelings of threat motivate behavioural intention and performance (van der Pligt & de Vries, 1998). This finding may explain why risk appraisals have less effect on alcohol consumption compared to other health risk behaviours such as sexual behaviours and smoking (Sheeran et al., 2013). As Babor (2010) points out ‘*alcohol is no ordinary commodity*’, meaning in this sense that consumption of alcohol presents opportunities for unique social benefits that are not apparent in other health risk behaviours; hence the social benefits of drinking may override the perception of risk, van der Pligt and de Vries (1998) highlight limited informational processing capabilities in humans, meaning our health decisions are informed by the most salient beliefs. The results also question whether young adults perceive alcohol consumption as a health behaviour or a social one?

In lieu of using risk appraisals to account for drinking decisions, the findings from chapter three suggest other motivational models of behaviour may be more apt to account for consumption; for example, the incentive motivational model (Cox & Klinger, 1988). Using this model we can frame the participants’ cost-benefit decision-making process, as the incentives for drinking, i.e., social gains, far outweigh the incentives to avoid drinking, such

as health gains (e.g., avoiding a hangover). Considering the decision-making process for drinking in this sense, may explain why previous empirical tests of regret provide limited predictive validity for drinking behaviours (Cooke et al., 2007; Jones et al., 2020). Future research testing predictive validity should focus on the cost-benefit perceptions of drinking, rather than perceptions of risk.

A novel finding from chapter three is that young adults reported experiencing inaction regret, in the form of FoMO from missing out on opportunities to drink socially. Participants sense of FoMO was expressed in terms of regret, in that they regretted missing out on the social gains they could have made from attending the social drinking events. The use of a cost-benefit analysis for informing future drinking decisions was also apparent in how young adults made sense of their experiences of missing out; participants perceived the negative consequences of excess drinking as preferable to experiencing the FoMO from missing the alcohol-related social events. This suggested that FoMO may provide an aversive form of motivation, that is underpinned by a cost-benefit analysis of weighing potential cons such as embarrassing yourself against the potential benefits such as building and strengthening relationships. This finding suggests that inaction regret may not inform decision-making in this sense, but rather is a by-product of the decision-making process, i.e., decisions are based on extrinsic motives for the avoidance of social losses.

The Fear of Missing Out (FoMO)

Currently the evidence regarding the relationship between FoMO and alcohol is limited, with mixed evidence regarding the prediction of consumption and alcohol-related consequences. However this is not surprising as the conception of FoMO as a psychological phenomenon was just under a decade ago by Przybylski and colleagues (2013). Nonetheless the findings from the thesis provide some novel insight into the relationship between FoMO and alcohol. Aside from the motivational impact of FoMO on drinking decisions, the thesis has provided assessment of personal narratives of FoMO, enabling insight into the underlying beliefs of what drives the phenomenon in the alcohol context. Conceptually FoMO is underpinned by Self-Determination theory (SDT: Deci & Ryan, 1985), hence FoMO is theorised to be driven by the perception of failing to meet the basic human needs of autonomy, competence, and relatedness. Chapter four explored the underlying beliefs of FoMO using personal narratives of lived experiences. Considering the results of this study we can draw support for the theoretical underpinnings of FoMO; the salient belief driving my participants experiences

was that non-attendance at the social drinking events meant missing out on making shared memories that are used to define and shape their social group's identity. This perception reflects how FoMO experiences are defined by the perception of missing out on the basic need of relatedness, in which we seek closeness and companionship with others (Deci & Ryan, 1985). Existing FoMO research highlights how the 'need to belong' a construct pertaining to the basic need of relatedness, moderates the relationship between problematic internet usage and FoMO (Beyens et al., 2016). It may be the case that the need to belong also moderates the relationship between FoMO and alcohol consumption, especially as drinking is perceived as a social imperative for young adults, and that social drinking is perceived to create stronger social bonds than other social activities (Dresler & Anderson, 2017; de Visser et al., 2013). However, this would need to be empirically tested.

In addition, participants expressed how their experiences of FoMO resulted in feelings of anxiety, worry and/or fear over being left behind and socially isolated from their peers. These experiences were underpinned by the perception of being unable to effectively act in their environment, for example participants expressed being unable to contribute to social interactions regarding the missed event, reflecting the inability to exercise competence. Moreover, there was a perception of feeling powerless when experiencing FoMO, this may have been driven by the belief of being unable to exercise autonomy, for example wanting to attend a social drinking event but missing out due to a lack of finances, i.e. the choice to willingly endorse in our chosen behaviour is removed. The findings from chapter four highlight how lived experiences of FoMO are underpinned by the concepts suggested by SDT.

Chapter four provides novel findings on how young adults cope with the negative affect (anxiety, worry, fear, regret) experienced because of their FoMO. Current literature has yet to provide insight into such coping behaviours. The results highlighted how a mixture of adaptive (e.g., cognitive reappraisal) and maladaptive strategies (e.g. vicariously experiencing missed events) were used. These strategies adopted either a problem-focused approach, aiming to solve the issue or an emotion-focused approach, attempting to relieve negative affect. An interesting finding from the participants' experiences on coping with FoMO was that they used problem-focused approaches in an attempt to resolve the negative affect; for example they discussed planning more nights out or increasing consumption above normal levels at the next event. This was potentially their attempt to control their reaction to FoMO, however this approach cannot resolve the issue (i.e. it cannot change the past), instead it served to attenuate the negative affect resultant of missing out. This suggests that problem-

focused coping behaviour can be utilised to relieve the negative affect associated with FoMO. Additionally engaging in the compensatory behaviours, such as attending even more nights out or drinking more than usual at future events highlights how the aversive motivation from the experience of FoMO impacts behaviour, i.e. the results of the cost-benefit analysis of weighing the cons of drinking too much against the benefits of attending the drinking events.

FoMO as a predictor of drinking outcomes

Chapter five provided a test of FoMO for the prediction of drinking outcomes. To my knowledge this is the first study to test if within-person fluctuations in FoMO predicts alcohol consumption, with results suggesting that FoMO has predictive validity for both drinking intentions and behaviour. Previous findings regarding the association between FoMO and alcohol are mixed; with FoMO being linked to binge drinking or single session drinking and alcohol-related consequences (Brunborg et al., 2021; Riordan et al., 2015; 2019). Conversely no associations have been found between FoMO and various measures of consumption; breath alcohol concentration, drinking frequency and quantity consumed (Riordan et al., 2015; 2019). The disparity between the previous results could be due to how FoMO was assessed, i.e. using retrospective accounts or using analyses comparing between participants based on a single measure of FoMO. However FoMO is a reactionary state, prompted by social information (Reagle, 2015), meaning that the experience of FoMO is variable; hence questioning whether a single measure is adequate for assessing the relationship between the construct and consumption. The results of chapter five add to the FoMO-alcohol literature by providing the first test of FoMO as a state variable, accounting for how within-person fluctuations impact drinking behaviours. Furthermore the results demonstrate how the experience of FoMO in real-time and in the real-world influence both future drinking decisions and consumption, which until now was unknown. Using EMA has enabled a stringent test of the construct's predictive validity that is simply not possible using the traditional survey methods outlined in the extant literature, for example it enabled me to account for context, i.e. I tested the relationships when behavioural performance was most likely to occur and in ecologically valid settings. The results from chapter five however need to be replicated. However accounting for within-fluctuations of FoMO in the real world and in real time indicate the relative merit for predicting drinking outcomes.

Conceptual contributions to FoMO

The results of chapter four highlight an important conceptual finding for how FoMO is experienced in the context of the real world, i.e. from in-person social interactions. FoMO experienced in this context may be a particular form of social anxiety, in which young adults perceive themselves as marginalised from group interactions, resulting in feelings of isolation and anxiety. This finding adds to the FoMO literature which suggests the experience of missing out in the digital context, results in social isolation, ostracism, and social anxiety (Beyens et al., 2016; Fioravanti et al., 2021). It may well be the case that social anxiety mediates the relationship between FoMO and alcohol consumption, however this remains to be tested.

The results of chapter six also provide some novel findings that impact our conceptual understanding of FoMO. Chapter six provides an assessment of the contexts for missing out, which up until now has rarely been performed (Milyavskaya et al., 2018). Evidence highlights that missing social events results in experiencing greater FoMO than from missing other activities (e.g. watching TV) (Milyavskaya et al., 2018); nonetheless from these findings we are unable to ascertain how context impact experiences of FoMO. This is especially pertinent as perceptions and behaviour are informed by contextual influences (Steinberg, 2001); although I don't claim to have accounted for all the potential contexts that may influence perceptions of FoMO, the study design in chapter six enabled a quantitative analysis of how certain experiences in different contexts impact the sense of missing out. Results indicate that FoMO was most pronounced in response to viewing vignettes that comprised a social experience in an alcohol context. This finding adds to the literature by enabling a more nuanced understanding of under what circumstances elicit the keenest sense of missing out. Furthermore, to my knowledge this was the first study (chapter six) to manipulate FoMO experimentally with explicit regard to alcohol consumption; resulting in evidence which suggests that alcohol related FoMO may be a distinct FoMO experience, supporting the qualitative results of chapters three and four, which highlights young adults experience FoMO from missing opportunities to drink in social settings.

The study design in chapter six also enabled an investigation into the possibility that FoMO, can be experienced as a feeling separate from regret and/or AR; results demonstrated that FoMO can be experienced without or with at least very low levels of regret. This is an interesting conceptual finding, as it suggests FoMO may be a discrete aspect of latent construct regret. It may be the case that removing the agency from poor decision-making, i.e.

the self-blame for missing a drinking event, results in the amelioration of the accompanying feelings of post or pre-decisional regret. Nonetheless to further understand this suggestion, research is needed to clarify how regret and AR interacts with FoMO.

Limitations and Future directions

The thesis has produced novel findings regarding the relationship between alcohol and regret; however, I acknowledge that there are some limitations that must be considered. The studies in the thesis only address individual and social influences on alcohol consumption, which is only a small part of the array of individual-level and population-level factors that interact to shape our alcohol use; for example cultural, environmental and policy factors (Sudninaraset et al., 2016). Whilst it would simply not be feasible to investigate the interaction of all the factors on drinking behaviours in a limited corpus of research, I do acknowledge that my findings are only a small piece of the puzzle regarding the determinants of young adults' drinking behaviours. Future research should investigate how social factors, such as FoMO interact with other factors e.g. cultural or policy to influence perceptions of drinking and consumption. A further limitation of the thesis was a lack of pre-registration, doing so would have increased the transparency and rigour of the empirical studies and their evaluations. In future any studies should be pre-registered with an authority such as the Open Science Framework.

Chapters three and four investigated lived experiences of alcohol-related regret and FoMO, using personal retrospective narratives; hence it was not possible to assess how the young adults anticipate experiencing regret and FoMO, which meant I was unable to make comparisons with quantitative work on the topic (Davies & Joshi, 2018; Jones et al., 2020, Riordan et al., 2015, 2019). Furthermore my female participants may have been less inclined to discuss sensitive issues in the focus groups and interviews, compared to the male participants who may have felt more comfortable discussing such issues with an older male. A further limitation of the qualitative studies was the homogeneity of the participants, in terms of their shared white ethnicity; meaning until further studies are conducted with more ethnically diverse samples the results may not represent the experiences of other ethnic groups.

Chapter five provided evidence for FoMO's predictive validity for drinking behaviours; however in considering these results we must acknowledge the timeframe of the data collection, during the second and third phases of the UK COVID-19 national lockdown. This means I cannot be certain that the effects found represent how FoMO influences consumption and intentions, as participants had limited opportunities to engage with social drinking; for example they were limited to socialising within their household or 'social bubble', whilst access to drinking establishments was either totally or partially restricted due to the lockdown measures. Now that restrictions have been completely removed, a further study should be conducted to ascertain FoMO's influence on drinking behaviours in an environment when opportunities to consume alcohol are abundant.

Chapter six highlights important conceptual findings regarding alcohol and FoMO; however I must acknowledge that the sample used for the study was comprised mostly of female participants from the UK, meaning the results may only be generalisable to this population. Nonetheless evidence from Rozgonjuk et al., (2021) highlights no gender differences in FoMO, and in turn future studies could examine if cultural factors impact alcohol related FoMO, enabling generalisation to other nations and cultures. Furthermore my findings regarding contextual influences on perceptions of FoMO, cannot be taken at face value. There is undoubtedly a large range of contextual influences on FoMO that was beyond the scope of my experiment, for example future studies could assess how cultural, ethnical, educational, or political contexts influence the relationship between FoMO and alcohol.

In addition to addressing the caveats from the thesis research, future studies could endeavour to explore the mediators and moderators of the alcohol and FoMO relationship. Studies could investigate if social anxiety has mediating effect; does the need to belong moderate the relationship and would sensation-seeking have a moderating effect. Such explorations would enable us to develop a keener insight into the underlying mechanisms that drive this predictor of drinking behaviours. Furthermore to fully explore the dynamic between FoMO and the latent construct regret, future research should strive to ascertain how regret and/or AR interacts with FoMO; for example what mechanisms link FoMO to regrettable behaviour or how do the emotions influence each other overtime, i.e. does the experience of regret blunt or augment perceptions of FoMO and vice-versa.

The cumulative results of the thesis highlight FoMO's potential suitability as an intervention target to reduce excess drinking in young adults. Firstly, FoMO is completely psychological

in nature (Przybylski et al., 2013) i.e. FoMO is a reaction to social information, which results in the perception of us missing out on something rewarding; hence it may be modifiable. Secondly, the results of the thesis highlight FoMO is directly experienced from missing out on alcohol related social events and, experiencing FoMO is predictive of drinking intentions and consumption. Therefore if we can change thoughts and perceptions of missing out then we should be able to reduce its effect on drinking behaviours. Thirdly, thesis findings demonstrate that FoMO can be experimentally manipulated. This means that with the right intervention design it should be possible to target FoMO as a way to reduce future consumption, potentially by reducing feelings of FoMO in the aftermath of a missed opportunity to attend a drinking event. Finally, the results have provided insight into the underlying beliefs for the experience of FoMO. Awareness of the underlying beliefs for FoMO enables a deeper understanding of how this experience motivates drinking behaviour. For example the results of the thesis highlight the various underlying beliefs; behavioural beliefs, i.e. missing out on making collective memories that will come to define and shape social groups/identities; the normative beliefs, i.e. social drinking is perceived as part of young adults' social identities and by attending drinking events they are conforming to the normative belief; and control beliefs, i.e. the lack of ability to influence the social environment, such as being unable to contribute to social interactions. Azjen (2006) suggests the most effective way to change behaviour is to target the underlying beliefs; in doing so we can potentially influence and change the key predictors of alcohol consumption (e.g. attitudes, intentions, norms).

Taking the findings together, a FoMO intervention could attempt to change these beliefs in several ways; (1) highlight that only positive alcohol-related images are shared online and that perceptions of missing out are greatly inflated (Lyons et al., 2016; Milyavskaya et al., 2018); (2) increase the salience of the benefits of missing out; and (3) highlight the 'joy of missing out' (JoMO; Aranda & Baig, 2018; Brinkmann, 2019), i.e. practicing self-restraint and moderation can develop a more fulfilling and satisfying way of life. The intervention messages and content could be constructed using vignettes. Initially a pilot study could be used for a priori test of the intervention vignettes; such a study could elicit feelings of FoMO from a vignette similar to alcohol-related examples used in the thesis, and then provide an intervention vignette, and analyse if it significantly reduces feelings of FoMO compared to a control.

If the results of the pilot suggest the intervention vignettes effectively reduce feelings of FoMO, then they could be used in an intervention study adopting a similar methodology to the EMA design outlined in chapter five. Ecological momentary intervention (EMI) (Heron & Smith, 2010; Riordan et al., 2015) could be used to deliver the intervention in ecologically valid settings and at times when young adults experience FoMO, for example at the weekends. A rudimentary procedure could follow this outline; an initial survey asking if participants are currently experiencing FoMO, along with an item assessing their drinking intentions. If participants report high scores in both assessments, then an intervention vignette would be presented, along with a further intentions assessment. To enable a quantitative test of the intervention's ability to reduce consumption, a control group would also be incorporated into the design. The control group members would also receive the initial survey regarding FoMO and intentions, however in lieu of the intervention vignette they would be presented with a control vignette on an unrelated topic and a further intentions assessment. The preceding day alcohol consumption from the previous day would be recorded. Using the control group scores it would enable a direct comparison with the intervention group, to assess if the intervention impacts intentions and consumption. Adopting a design such as this would enable us to investigate if a FoMO intervention impacts consumption in the real world, across time and context.

Conclusion

In conclusion, the results of the thesis provide evidence as to why experiencing alcohol-related regrets fails to inform future drinking plans; the experience of regret has limited impact on risk appraisals, as post-consumption regrets are an established and expected part of a drinking episode, but also future drinking decisions may be based on a subjective cost-benefits analysis. Young adults report experiencing FoMO when they are unable to attend alcohol-related social events, and that experiencing FoMO provides a form of aversive motivation for attendance at future events. Experiences of FoMO were underpinned by the perception of missing out on creating shared memories that are used to define and strengthen social groups and identities. Missing out on such memories results in worry and anxiety over social status, suggesting it may be a form of social anxiety. Coping behaviours using both approach and avoidance strategies are utilized to alleviate associated negative affect. Furthermore the thesis demonstrates FoMO can predict both drinking intentions and consumption. Finally results indicate that FoMO may be a distinct form of the latent regret, however research needs to confirm how the emotions interact with each other. The amassed

findings suggest FoMO may be a fruitful target in an alcohol intervention for young adults wanting to reduce their harmful drinking patterns. The thesis overall provides explanation as to why regret has limited predictive validity for drinking behaviours, however the most pertinent findings are the unique insights it offers into the understudied construct of FoMO. It highlights how this imagined sense of missing out has a real-world impact on young adults' thoughts, perceptions, and behaviour.

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Appendices

Appendix A: COREQ checklist

Manuscript: You see the pictures the morning after and you're like I wish I was in them – An Interpretative Phenomenological Analysis of University Student's Alcohol-related Regrets.

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Developed from:

Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
<i>Personal Characteristics</i>		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Page 8
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Page 1
3. Occupation	What was their occupation at the time of the study?	Page 1 and 8
4. Gender	Was the researcher male or female?	Page 1
5. Experience and training	What experience or training did the researcher have?	Page 1 and 8
<i>Relationship with participants</i>		
6. Relationship established	Was a relationship established prior to study commencement?	Page 8
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Page 8
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Page 8

Domain 2: study design		
<i>Theoretical framework</i>		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Page 9
<i>Participant selection</i>		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Page 8
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Page 8
12. Sample size	How many participants were in the study?	Page 7
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Page 8
<i>Setting</i>		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Page 7
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Page 8
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Page 8
<i>Data collection</i>		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Page 8
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	No
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Page 9
20. Field notes	Were field notes made during and/or after the inter view or focus group?	Page 9
21. Duration	What was the duration of the inter views or focus group?	Page 8

22. Data saturation	Was data saturation discussed?	Not an objective per se of IPA but as recommended by Pietkiewicz & Smith (2012) 10 to 15 participants are enough for a larger sample.
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Page 9
Domain 3: analysis and findings		
<i>Data analysis</i>		
24. Number of data coders	How many data coders coded the data?	Page 8
25. Description of the coding tree	Did authors provide a description of the coding tree?	Page 10
26. Derivation of themes	Were themes identified in advance or derived from the data?	Page 10
27. Software	What software, if applicable, was used to manage the data?	N/A
28. Participant checking	Did participants provide feedback on the findings?	Page 9
<i>Reporting</i>		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Page 11 to 21
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Yes, there was. Page 11 to 21
31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes. they were. From page 11 to 21
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Discussion of major and minor themes From page 11 to 21

Appendix B: Alcohol-Social vignette

Female reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You are sat at home one evening after class and you are working hard on finishing an assignment that is due tomorrow....



Whilst working on your assignment your phone beeps and you receive a snapchat message from a close friend who is at an impromptu party, drinking with some of your other friends....



The message reads: *“Epic party at Tom’s!”*

Male reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You are sat at home one evening after class and you are working hard on finishing an assignment that is due tomorrow....



Whilst working on your assignment your phone beeps and you receive a snapchat message from a close friend who is at an impromptu party, drinking with some of your other friends....



The message reads: *“Epic party at Tom’s!”*

Appendix C: Alcohol-Novel vignette

Female reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You work at a part time job a few evenings a week. Whilst at work one evening, your boss asks if you can stay late and work some overtime. You have no plans for the rest of the evening, so you agree to the overtime.



Later that evening, you are on a break and you receive a message from your friend who is in the queue for a music gig. You have been wanting to see the band playing for a while and your friend has offered you a spare ticket and some drinks vouchers...



The message reads: “Got a spare ticket and some drink vouchers, wanna come?”

Male reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You work at a part time job a few evenings a week. Whilst at work one evening, your boss asks if you can stay late and work some overtime. You have no plans for the rest of the evening, so you agree to the overtime.



Later that evening, you are on a break and you receive a message from your friend who is in the queue for a music gig. You have been wanting to see the band playing for a while and your friend has offered you a spare ticket and some drinks vouchers...



The message reads: *“Got a spare ticket and some drink vouchers, wanna come?”*

Appendix D: Alcohol-Comparable vignette

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You are at a party, drinking alcohol with your flatmates...



The party is good fun, and you are enjoying yourself. Your phone beeps and you receive a snapchat message from a friend on your course. They are on a night out with other friends you have meet on your course...



The message reads *“Having a great night with the psychology guys!”*

Appendix E: Non-Alcohol – Social Vignette

Female reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You work at a part time job a few evenings a week...



Whilst at work one evening, you are on a break and you receive a snapchat message from a friend who are currently having an impromptu movie night with some other friends



The message reads *“Movie night in the flat, if you’re up for it?”*

Male reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You work at a part time job a few evenings a week...



Whilst at work one evening, you are on a break and you receive a snapchat message from a friend who are currently having an impromptu movie night with some other friends



The message reads *“Movie night in the flat, if you’re up for it?”*

Appendix F: Non-Alcohol – Novel vignette

Female reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You are studying at home one evening...



Whilst taking a break, you are scrolling through your Instagram and you see that friends from your course are currently attending an interesting seminar by a guest lecturer...



Their Instagram reads “*Great seminar so far, looking forward to part 2!*”

Male reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You are studying at home one evening...



Whilst taking a break, you are scrolling through your Instagram and you see that friends from your course are currently attending an interesting seminar by a guest lecturer...



Their Instagram reads “*Great seminar so far, looking forward to part 2!*”

Appendix G: Non-Alcohol – Comparable vignette

Female reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You decide to go home after class and work on an assignment that is due soon...



Whilst taking a break from your work, you receive a snap chat message from a friend on your course. They are in library with other students working on the assignment together...



The message reads: *“We’re working through ideas for the assignment, how are you getting on?”*

Male reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You decide to go home after class and work on an assignment that is due soon...



Whilst taking a break from your work, you receive a snap chat message from a friend on your course. They are in library with other students working on the assignment together...



The message reads: *“We’re working through ideas for the assignment, how are you getting on?”*

Appendix H: Control – Social vignette

Female reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You work at a part time job a few evenings a week...



Whilst at work one evening, you are on a break and you receive a snapchat message from a friend who is currently visiting a grandparent...



The message reads: *“My nan is now on TikTok lol!”*

Male reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You work at a part time job a few evenings a week...



Whilst at work one evening, you are on a break and you receive a snapchat message from a friend who is currently visiting a grandparent...



The message reads: *“My nan is now on TikTok lol!”*

Appendix I: Control – Novel vignette

Female reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You are sat at home one evening after class and you are working hard on finishing an assignment that is due tomorrow....



Whilst working on your assignment your phone beeps and you receive a message from a close friend who is currently returning from a business conference



The message reads: “*Finished at the conference. What are you up to?*”

Male reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You are sat at home one evening after class and you are working hard on finishing an assignment that is due tomorrow....



Whilst working on your assignment your phone beeps and you receive a message from a close friend who is currently returning from a business conference



The message reads: *“Finished at the conference. What are you up to?”*

Appendix J: Control – Comparable vignette

Female reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You are sat at home one evening after class and you are working hard on finishing an assignment that is due tomorrow....



Whilst working on your assignment your phone beeps and you receive a message from a close friend who is also completing their assignment...



The message reads: *“How you are getting on with the assignment?”*

Male reference:

Please read the following scenario, imagine the scene happening to you, and answer the following questions.

You are sat at home one evening after class and you are working hard on finishing an assignment that is due tomorrow....



Whilst working on your assignment your phone beeps and you receive a message from a close friend who is also completing their assignment...



The message reads: *“How you are getting on with the assignment?”*

Appendix K: Updated Alcohol-Social vignette

Please read the following scenario, imagine the scene happening to you, and answer the following questions, thinking about how you would feel in that exact moment.

You are sat at home one evening revising for an exam tomorrow morning...



Whilst taking a break from revising your phone beeps and you receive a snapchat message from a close friend, who is drinking at a party with some of your other friends. The party was spontaneous and unplanned.



The message reads: *“Epic party at Tom’s!*

Appendix L: Updated Alcohol – Novel Vignette

Please read the following scenario, imagine the scene happening to you, and answer the following questions, thinking about how you would feel in that exact moment.

You work at a part time job a few evenings a week. Whilst at work one evening, your boss asks if you can stay late and work some overtime for triple pay. You have no plans for the rest of the evening, so you agree to the overtime.



Later that evening, you are on a break and scrolling through your Instagram you see your friend in the queue for a music gig...



The message reads: *“Can’t wait for tonight, going to be epic!”*

Appendix M: Updated Alcohol – Comparable vignette

Please read the following scenario, imagine the scene happening to you, and answer the following questions, thinking about how you would feel in that exact moment.

You are at a party, drinking alcohol with your flatmates...



The party is good fun, there are some friends are there that you have not seen for a while, and you are enjoying yourself. Your phone beeps and you receive a snapchat message from a friend on your course, who is on a night out with other people on the course. The night out was unplanned.



The message reads *“Having a great night with the psychology guys!”*

Appendix N: Updated Non-Alcohol – Social vignette

Please read the following scenario, imagine the scene happening to you, and answer the following questions, thinking about how you would feel in that exact moment.

You work at a part time job a few evenings a week. Whilst at work one evening, your boss asks if you can stay late and work some overtime for triple pay. You have no plans for the rest of the evening, so you agree to the overtime.



Whilst at work one evening, you are on a break and you receive a snapchat message from a friend who are currently having a movie night with some other friends. The movie night is spontaneous and unplanned.



The message reads “*Movie night in the flat!*”

Appendix O: Updated Non-Alcohol – Novel vignette

Please read the following scenario, imagine the scene happening to you, and answer the following questions, thinking about how you would feel in that exact moment.

You are sat at home one evening revising for an exam tomorrow morning...



Whilst taking a break, you are scrolling through your Instagram and you see that some friends are currently attending an interesting lecture by a guest lecturer. You were unaware the lecture was taking place.



Their Instagram reads “*Great lecture so far, looking forward to part 2!*”

Appendix P: Updated Non-Alcohol – Comparable Vignette

Please read the following scenario, imagine the scene happening to you, and answer the following questions, thinking about how you would feel in that exact moment.

You are at home revising for an exam tomorrow morning...



Whilst taking a break from your revision, you receive a snap chat message from a friend. They are in library with fellow course mates, revising together for the exam...



The message reads: *“Almost ready for exam, how are you getting on?”*

Appendix Q: Updated Control – Novel Vignette

Please read the following scenario, imagine the scene happening to you, and answer the following questions, thinking about how you would feel in that exact moment.

You are sat at home revising for an exam tomorrow morning...



Whilst taking a break from revising, you receive a snapchat message from a friend, who is helping their brother to move to a new house...



The message reads: *“Helping Ben move, I’m wrecked! What are you up to?”*