DRINKING BEHAVIOUR AND DRINKING MOTIVATIONS IN EMERGING ADULTHOOD: HOW DO OUR ROMANTIC RELATIONSHIPS AND FRIENDSHIPS AFFECT OUR ALCOHOL USE?

by

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

In my dissertation, I sought to better understand how social influence and drinking motivations impact drinking behaviour within close interpersonal relationships. I focused on the developmental period of emerging adulthood as this developmental phase is associated with increased risk of alcohol misuse. Moreover, I focused on two important close interpersonal relationships during this developmental period: romantic couples and drinking buddies (i.e., an individual someone chooses to drink with). The five-factor model of drinking motivations suggests individuals drink to achieve desired outcomes from their drinking. Each motive is associated with different alcohol use patterns: enhancement (to experience pleasure), social (to increase social affiliation), conformity (to reduce negative peer pressure), coping-anxiety (to reduce anxiety) and coping-depression (to reduce negative affect). While drinking motives have been investigated extensively among individuals, no research had investigated drinking motives within these important close relationships. Study 1 expanded the extant literature by evaluating whether drinking motives as well as drinking behaviours were similar among members of $N = 203$ romantic couples. Couples were found to be similar in both their drinking motives and drinking behaviours and drinking behaviour similarity was related to how often the couples spent time drinking together as well as how often they spent face-to-face time together. Study 2 expanded Study 1 by investigating the degree to which romantic couples influence one another's drinking behaviour via drinking motives. Utilizing the same four-wave, four-week data collected in Study 1, multilevel Actor-Partner Interdependence Models (APIMs) were utilized in Study 2 to investigate the influence drinking motives had on partner drinking both over time and when averaged across time. Partner positive reinforcement motives (enhancement and social) as well as coping-anxiety motives, positively predicted individual drinking quantity both over time and when averaged across time. This finding suggested that romantic partners' drinking motives conferred influence on the drinking of individuals. Moreover, this influence was mediated by change in individual drinking motives. That is, if a partner drank for social motives, that influenced the individual to drink for social reasons, which in turn influenced the individual's drinking quantity. Study 3 contained a different dyadic sample and was novel in its investigation of drinking motives within drinking buddy relationships ($N = 174$ dyads). Utilizing a four-wave, four-month design, multilevel APIMs were utilized to investigate drinking buddy influence and to replicate and extend findings from Study 2 into another important dyadic relationship. Partially replicating Study 2, partner positive reinforcement motives and coping-anxiety motives predicted individual drinking frequency over time. Social motives also mediated partner influence. Supplemental analyses showed that along with romantic couples, drinking buddies were also similar in their drinking motives and drinking behaviours. Taken together, my studies suggest that drinking motives exert influence on alcohol use not just within individuals, but between individuals in close relationships (romantic or friendships). This social influence may result in increased drinking behaviour over time, and therefore suggests that drinking motives may be important targets for both individual alcohol use treatment and for couples or network therapy.

LIST OF ABBREVIATIONS AND SYMBOLS USED

APIM	Actor-Partner Interdependence Model
ACHA	American College Health Association
APA	American Psychiatric Association
BCT	Behaviour Couples Therapy
ΔBIC	Change in Bayesian Information Criterion
$\chi 2$	Chi-square
r_{pa}	Coefficient of profile agreement
d	Cohen's d
CFI	Comparative fit index
CI	Confidence interval
CN	Conformity motives
CAM	Coping-anxiety motives
CDM	Coping-depression motives
α	Cronbach's alpha
DSM-5	Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition
DMQ-R	Drinking Motive Questionnaire- Revised
EN	Enhancement motives
H	Hypothesis
ICC	Intraclass correlation
MLR	Maximum likelihood estimation
M	Mean
NT	Network Therapy
t	One-sample t-test
p	P-value
r	Pearson correlation
R^2	R-squared
RSA	Response surface analysis
RMSEA	Root mean square error of approximation
N	Sample size
STLFB	Self-Administered Timeline Follow-Back
SC	Social motives

SLT	Social learning theory
SRMR	Stand root mean square residual
SD	Standard deviation
SE	Standard error
SPSS	Statistical Package for the Social Sciences
SAMHSA	Substance Abuse and Mental Health Services Administration
TLI	Tucker-Lewis index
B	Unstandardized path coefficient

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CHAPTER 1. INTRODUCTION

My dissertation examines the role of social influence and drinking motivations in the drinking behaviour of young people (i.e., emerging adults and university students). It includes three publication-style manuscripts. The first explored whether romantic couples were similar in terms of their drinking motivations and drinking behaviours. Predictors of such similarity were also explored via correlation. The second tested whether the drinking motivations of one romantic partner influenced the other partner's drinking behaviours over a 4-wave, 4-week period. Actor-partner interdependence models (APIMs) were used to examine actor and partner effects within a multilevel model framework. The third sought to replicate and extend the second study's findings in a sample of drinking buddy dyads over a 4-wave, 4-month period. Emerging adulthood was defined as 18-25 years (Arnett, 2000), and a drinking buddy was defined as someone with whom an individual drinks alcohol with (Reifman et al., 2006). Before presenting the findings of each study, I will introduce the following: the problem of alcohol misuse during emerging adulthood, theoretical accounts of social influence on alcohol consumption that inform my dissertation, and the objectives of my research.

Alcohol Use in Emerging Adulthood

Emerging adulthood is characterized by increased risk-taking behaviours, including substance use. During this period, limbic structures in the brain (implicated in memory, affect, and reward) mature faster than the prefrontal cortex (implicated in planning, inhibition, and high-order cognitive function; Lisdahl et al., 2013). Behavioural disinhibition related to lack of brain maturation, as well as many other social, psychological, and environmental factors, confer increased risk of alcohol use and abuse during this developmental period (Leung et al., 2014). According to the *Diagnostic and Statistical*

Manual of Mental Disorders- Fifth Edition (DSM-5; American Psychiatric Association [APA], 2013), the first episode of alcohol intoxication likely occurs during the mid-teenage years. However, the age at onset of a diagnosable alcohol use disorder, with multiple criteria contributing to the disorder, peaks in the late teens to mid 20s (Schuckit, 2009). Indeed, rates of alcohol use disorder are highest in emerging adulthood (Park et al., 2006). In the United States, it is estimated that 10.9% of emerging adults meet criteria for an alcohol use disorder, whereas 2.5% of adolescents and 5.4% of adults over the age of 25 meet these criteria (Substance Abuse and Mental Health Services Administration [SAMHSA], 2016). Moreover, research has demonstrated that the age of onset for the majority of cases of lifetime substance use disorder occurs by the end of emerging adulthood (Compton et al., 2007).

Along with brain-based changes, emerging adulthood is marked by many psychosocial shifts that confer risk for alcohol misuse. The transition into university brings about more personal freedoms; time spent with peers overtakes time spent with parents (Borsari & Carey, 2001). With reduced parental monitoring, exposure to alcohol and other drugs increases (Bergman et al., 2016). Through peer interactions, normative behaviours and attitudes toward alcohol use model the permissibility of excessive drinking (Bagozzi & Lee, 2002). Given access to substances increases during this developmental phase (Alberta Alcohol and Drug Abuse Commission, 2003) and personal freedom is at its highest, it is unsurprising emerging adults are at the highest risk for alcohol use disorders.

Emerging adults endorse the highest rates of alcohol use when compared to both adolescents (Park et al., 2006) and older adults (Compton et al., 2007). In the United States, data suggests about 2 out of 5 emerging adults aged 18 to 25 are current binge alcohol users (i.e., drinks four/five or more drinks on the same occasion during the past month for women

and men, respectively), and 1 out of every 10 emerging adults is a heavy alcohol user (i.e., binge drinks on 5 or more occasions during the past month; SAMHSA, 2016). In Canada, the highest proportion of heavy drinking for both sexes is among those aged 18 to 24, with 33.5% of males and 23.8% of females in that age range indicating they are heavy drinkers (i.e., binge drinking at least once a month during the past year; Statistics Canada, 2018). Finally, The National College Health Assessment surveyed alcohol use on university and college campuses specifically (American College Health Association [ACHA], 2016). In the Canadian subsample, 69% had used alcohol in the past month, with 35% of students indicating they engaged in binge drinking at least once within the past two weeks.

With heavy alcohol use comes associated costs. During emerging adulthood, alcohol-related problems are incredibly common and can have long-term effects on physical and psychological well-being (Schulenberg et al., 2003). Common problems stemming from excessive alcohol use include fatal and non-fatal injuries, overdoses, academic/vocational failures, sexual and nonsexual violence, and other crimes (Perkins, 2002). College and university students also report frequently regretting something they did, forgetting what they did or who they were with, and having unprotected sex due to their alcohol consumption (ACHA, 2016). Heavy alcohol consumption also impacts several domains of cognition, especially structures related to executive functioning and memory in emerging adulthood (Scaife & Duka, 2009). Alcohol use has negative consequences not only for the individual, but also for their environment. Second-hand harms are alcohol-related harms experienced by someone other than the individual drinking (Giesbrecht et al., 2010). Common second-hand harms include vandalism, violence, interrupted sleep, and harassment of others (Thompson et al., 2017).

In summary, emerging adults are more likely than any other age group to engage in

risky alcohol use and to experience related harms (ACHA, 2016; Park et al., 2006). Given the high prevalence of alcohol use and its associated costs, this is an incredibly important population to study. Thus, my dissertation focuses on the alcohol use of emerging adults and their romantic partners/drinking buddies.

Social Influence and Alcohol Use

Research suggests that social influence is one of many determinants of alcohol use in emerging adults, including biological, environmental, and psychological factors (Sher, 2016). Drinking is viewed as a key element of the social lives of many young people (de Visser et al., 2013), and individuals drink in higher quantities when with friends than when alone (Borsari & Carey, 2001). As a result of the social nature of alcohol use, many public health initiatives that are aimed at reducing alcohol use in emerging adults have been criticized for their focus on physical risks and harms as opposed to the group-based social nature of drinking (Fry, 2011). This issue is especially pertinent given emerging adults tend to not consider their own drinking as harmful (Hutton, 2012). Within social relationships, influence on alcohol use occurs via many different avenues, such as through social cohesion and bonding, socialization, and selection, and through learning of social norms and expectancies related to alcohol use. Given the social nature of drinking (Sher, 2016), and the multitude of negative consequences associated with heavy use in emerging adulthood (Schulenberg et al., 2003), my dissertation focuses on how emerging adult relationships influence individual alcohol use. A summary of theoretical accounts of social influence follow.

Sociocultural Influence

Drinking alcohol is considered to be a social activity in many cultures (Douglas, 1987; Wilson, 2005), and the historical customs and etiquettes associated with consuming

alcohol are often in place to promote social interaction and bonding (Wilson, 2005). Anthropologists suggest that drinking alcohol is an important and celebrated aspect of many societies (Heath, 1987), centering alcohol use as an act of identification, differentiation, and integration within cultural and ethnic identity (Wilson, 2005). Alcohol is associated with significant culturally specific behaviours, ideas, and values (Heath, 2000). For example, social engagements are often marked by the presence of alcohol across cultures (Gusfield, 1987). Moreover, drinking to enhance social affiliation is the most endorsed motivation for drinking across multiple countries (Kuntsche et al., 2005; Mackinnon et al., 2017a), indicating individuals are primarily motivated to drink for social reasons. Differences in cultural norms and beliefs are among the strongest predictors of drinking behaviour as well (O'Grady et al., 2011). For example, across different races and ethnicities, African American and Latino individiuals report more conservative attitudes toward drinking when compared to Caucasian individuals (LaBrie et al., 2012). These conservative norms are thought to be associated with lower drinking rates among these groups (SAMHSA, 2016).

Distinctions between drinking cultures have historically been drawn between "wet" cultures and "dry" cultures (Keller et al., 1982). "Wet" cultures tend to be characterized by frequent consumption of moderate amounts of alcohol (e.g., France), where drinking is incorporated into everyday life (Heath, 1995). Conversely, "dry" cultures tend to have patterns of infrequent daily use but frequent heavy drinking occasions (e.g., the United States and Canada; Heath, 1995). However, this dichotomy has been challenged in recent years given these distinctions were based predominantly on male drinking patterns (Leifman, 2001). Extending this dichotomy, four types of drinking cultures have been identified by Room and Mäkelä (2000) that are based on the regularity of drinking and the extent that individuals binge drink: abstinent societies (i.e., drinking is religiously or legally forbidden),

constrained ritual drinking (i.e., drinking for ritual purposes and not for intoxication), banalized drinking (i.e., drinking is woven into daily life and intoxication is not the goal) and fiesta drunkenness (i.e., drinking for the purpose of intoxication). It appears that modern drinking cultures are blending, reflecting the homogenization of lifestyles, greater female independence, urbanization and the globalization of alcohol marketing (Gordon et al., 2012; Jernigan, 2009). This blending of culture is reflected in the way alcohol is consumed, where an increasing number of countries that were previously considered "wet" (e.g., Spain) are now increasing their heavy drinking habits (Gordon et al., 2012). In their review, Gordon et al. (2012) argue that modern drinking culture can be categorized by the culture's hedonistic tendencies, the function of alcohol use (e.g., inter/intrapersonal, ritual, or intoxication), and the extent to which alcohol use is subject to social control. This typology highlights alcohol use as a global phenomenon that is centered within the social culture of countries around the world.

The "culture of drinking" among emerging adults is marked by permissiveness of heavy drinking, where students view university as a place to drink excessively before assuming the responsibilities of adulthood (Perkins, 1997). Moreover, alcohol and group drinking work effectively as a social lubricant and bind groups together (de Garine, 2001). Alcohol's ability to bind groups together is especially relevant during transitions in emerging adulthood, where individuals immerse themselves in their social environment to build new peer networks (Martin & Hoffman, 1993). Part of that immersion frequently involves alcohol use given it is an approved of and encouraged part of the culture of this age group. Thus, researchers have suggested the many social benefits of alcohol use on cultural cohesion and bonding may be related to why it has persisted for thousands of years (Dietrich et al., 2012).

Social Bonding and Cohesion

Alcohol use is accompanied by enhanced feelings of togetherness (Brown & Gregg, 2012), and non-drinkers are viewed as less sociable than individuals who drink (Zimmerman & Sieverding, 2011). Moreover, research suggests that students who drink often believe that it will result in the facilitation of social activities (Christiansen et al., 2002; Hensley, 2001), and the belief that alcohol use enhances social functioning is predictive of how much alcohol a student will consume (Smith et al., 1995; Vik et al., 1999). Another way alcohol plays an important role in the social context is by reducing social inhibitions (Monahan & Lannutti, 2000). Social drinkers believe that alcohol relaxes them, improves their mood and communication skills, and reduces their anxiety (Norris, 1994). Moreover, researchers suggest negative consequences experienced as a result of alcohol consumption are filtered through the lens of a "drunken narrative" (Griffin et al., 2009), where individuals anticipate the positive social consequences of recanting a "good" drinking story. Thus, even when alcohol results in negative personal experiences it is socially reinforced via the pleasure experienced when retelling a story to friends. Further reinforcing the social nature of alcohol use, heavy drinking within a social context may buffer some of the negative consequences of heavy drinking. For example, college students who drink heavily when alone experience elevated alcohol-related problems, more frequent use, increased depression, and hold more positive expectancies related to alcohol's ability to reduce their negative affect when compared to individuals who drink heavily only socially (Christiansen et al., 2002). Thus, drinking heavily with others appears to protect emerging adults from some of the negative consequences of heavy drinking.

Social bonding and cohesion may help further explain why alcohol use persists in emerging adulthood despite negative consequences (de Visser et al., 2013). Alcohol use is linked to endorphin release in humans (Froehlich, 1997; Gianoulakis, 2004). This finding is

of note given the endorphin system is incredibly important for social bonding in humans (Machin & Dunbar, 2011; Panksepp, 2010), where the experience of endorphin-induced pleasure in a social setting leads to positive associations with those present (Machin & Dunbar, 2011). Endorphins also create feelings of relaxation (a property of opiates), increased immune function (Sarkar et al., 2012), and play a role in reward as well as in pain control (Zubieta et al., 2001). Given alcohol use is also associated with endorphin release, drinking may have indirect fitness benefits through the positive effect it has on network size/composition, something that is related to health and survival in humans (Dominguez & Arford, 2010; House, 2001). Overall fitness benefits may help explain why alcohol use continues to be widespread despite the many negative consequences associated with its use (Dunbar et al., 2017). From this viewpoint, alcohol use may function similarly to other endorphin-releasing activities found among humans that promote social affiliation (such as laughing, singing, and dancing; Dunbar et al., 2012; Pearce et al., 2015; Tarr et al., 2015). Dunbar et al. (2017) demonstrated that social drinkers have more friends than those who do not drink and feel more engaged with and trusting of their local community. Moreover, those who drank "casually" were more socially engaged than those who did not drink. Thus, release of endorphins when drinking with others may bond humans closer together, something that is evolutionarily beneficial to survival (Dominguez & Arford, 2010).

Media Influence

Within the sociocultural environment, media plays an important role in suggesting what is normative behaviour (Collins et al., 2003), and this includes alcohol use (Noguti & Russell, 2014). Young people find much of alcohol advertising to be appealing and attractive (Chen et al., 2005). Positive appraisals of alcohol advertisements have been found to be related to young people's liking of specific alcohol brands, positive alcohol expectancies,

and increases in consumption over time (Austin et al., 2006; Grenard et al., 2013). Social media has begun to plan an increasingly important role in the advertisement of alcohol use in recent years, especially when targeted toward adolescent and emerging adult populations (Hoffman et al., 2014). Indeed, researchers estimate that approximately two-thirds of alcohol advertising occurs via new media (Saffer & Dave, 2006). Social media venues are most widely used by young people, with 92% of adolescents indicating they use social media daily (Lenhart, 2015), and with 72% of individuals aged 18-29 indicating they use social networking sites (Lenhart et al., 2010). Engaging in social media related to alcohol marketing predicts alcohol consumption among college students, whereas general social media engagement does not (Hoffman et al., 2014).

Beyond alcohol advertisements, exposure to movies that involve drinking is longitudinally predictive of later alcohol use and problems in young adults (Dal Cin et al., 2009). Researchers suggest that observing actors on television and in movies drink alcohol likely leads to imitation of that behaviour (i.e., via vicarious reinforcement; Bandura, 1977; Quigley & Collins, 1999). Experimental studies support this idea, as individuals who are exposed to movies or commercials where alcohol is consumed drink more alcohol than those who are exposed to media containing no alcohol consumption (Engels et al., 2009). From this finding, it appears that individuals are influenced to drink not only by models in their immediate environment (as discussed below), but by those whom they witness on television as well. Music has also been investigated as a potential influence on alcohol consumption. Studies suggest that music preference is linked to substance use in emerging adults, where liking rave, rap and heavy metal music is predictive of alcohol consumption (Arnett, 1991; Forsyth et al., 1997; Miranda & Claes, 2004). Explanations related to how music is predictive of alcohol use vary. Miranda and Claes (2004) suggest the relationship between

rap and drinking may be related to assimilation of values that are expressed by the lyrics, which often include explicit mention of substance use. Conversely, Forsyth et al. (1997) suggests identifying with certain musical cultures likely encourages substance use. Both accounts focus on how drinking norms and values are likely influenced by music, although a reciprocal relationship whereby individuals prone to use alcohol seek out music that fits their values is also likely (Forsyth et al., 1997).

In summary, alcohol use plays an important role in social bonding and cohesion across cultures (Douglas, 1987; Heath, 1987). Associations with endorphin release, which promotes social bonding in humans, along with improvements in overall fitness suggests alcohol use has evolutionary benefits despite its negative consequences (Froehlich, 1997; Gianoulakis, 2004; House, 2001; Machin & Dunbar, 2011). Emerging adulthood is marked by a time of transition where new social bonds are being formed, and where "drinking culture" supports heavy drinking behaviour (Martin & Hoffman, 1993; Perkins, 1997). Media influences cement alcohol use as a normative behaviour, and imitation of valued models is likely to occur (Engels et al., 2009; Quigley & Collins, 1999). Thus, sociocultural factors, bonding, and social cohesion combine to create an environment where alcohol use is accepted and highly likely to occur for emerging adults. The mechanisms through which these factors confer influence are reviewed below.

Social Learning Theory

One of the most influential theories of human behaviour is social learning theory (SLT). Several prominent psychologists have written about social learning processes (e.g., Akers, 1985; Dollard & Miller, 1950), with Dr. Albert Bandura likely being the most influential writer in regard to SLT within the alcohol use field (Maisto et al., 1999). According to Bandura (1969), SLT includes four core principles: differential reinforcement,

cognitive processes, reciprocal determinism, and vicarious learning.

Differential reinforcement is derived from learning principles (i.e., operant conditioning; Skinner, 1938), where behaviour is shaped through reward and punishment. Through operant conditioning, individuals make associations between behaviours and the consequences they elicit. Behaviours that are rewarded are more likely to occur again, whereas behaviours that are punished are less likely to reoccur. Bandura (1969) suggested that individuals are differentially reinforced for the same behaviour depending on the environment they find themselves in. Positive and negative reinforcement, withdrawal and punishment occur in the individual's environment to differing degrees when it comes to alcohol use. For example, drinking alcohol in a party setting likely leads to rewards such as relaxation and increased social affiliation. However, that same behaviour is likely punished in a workplace setting. As a result of this contingency, drinking is more likely to occur during a party than at the workplace.

Cognitive processes are viewed by Bandura (1969) as mediating environmental events and behaviour. Encoding, organizing, and retrieving information regulates behaviour, and the environment is what provides the information to be cognitively processed. One of the most important things individuals glean from their environment is the likely consequences for a certain behaviour in a specific environment (Bandura, 1977). Expectancies for behavioural outcomes guide behaviour as individuals act to obtain reinforcement. For example, situation-specific alcohol expectancies predict drinking behaviour, where relaxation expectancies are prospectively related to alcohol consumption only in social and sexual contexts (MacLatchy-Gaudet & Stewart, 2001). Not only does the environment influence the individual, but the individual can influence their environment through reciprocal determinism processes (Bandura, 1986). Here, the person, their behaviour and the

environment all influence each other to varying degrees depending on the setting. For example, an individual may drink heavily to cope with negative reactions from others that are a result of their heavy drinking.

Finally, Bandura (1969) suggested that a large amount of human behaviour is likely acquired through observation of others. As a result, humans do not need to directly experience the consequences of a behaviour to learn that it is reinforcing, we simply need witness it being reinforced in others. In this way, vicarious learning can create extinction of potentially punishing behaviour, and promote internalization of potentially rewarding behaviour (Bandura, 1977). Group norms of alcohol use are learned through observation of models in the immediate environment as well as through cultural depictions of alcohol use. As discussed later, peer alcohol use becomes incredibly influential during emerging adulthood where the permissibility of heavy alcohol consumption is communicated through observed drinking behaviour in peers (Maisto et al., 1999).

In summary, Bandura (1969) emphasized modeling as a major source of the acquisition of drinking patterns and indicated that social factors are important in both the acquisition and later maintenance of drinking behaviours. Environmental factors, beliefs, expectations, and norms related to alcohol use, prior learning, observation of models, and predicted consequences of alcohol use all influence how much, how often, and in what circumstances an individual will drink. Norms and expectancies are learned from important environmental models and serve to vicariously reinforce drinking. Thus, it is the combination of environmental and cognitive factors that serve to maintain alcohol use. Empirical evidence of social learning processes in alcohol use follows.

Social Learning Processes in Modeling, Social Norms, and Alcohol Expectancies

As previously mentioned, modeling refers to a social influence process where

observation of another performing a behaviour influences the likelihood of a person engaging in that behaviour (i.e., vicarious learning; Bandura, 1971). Nonexperimental studies suggest modeling influences come into play before a person takes their first drink, where observation of familial drinking patterns prior to alcohol use onset predicts alcohol use longitudinally in adolescent samples (Ary et al., 1993). Peer, parent, and sibling alcohol use predict adolescent alcohol use (e.g., Windle, 2000). Moreover, in emerging adults the developmental shift away from parental monitoring (Arnett, 2000) results in peer alcohol use becoming the strongest predictor of emerging adult drinking within the social network (Borsari & Carey, 2001; Patrick et al., 2016). Early experimental studies established that modeling can be a causal determinant of drinking (Borsari & Carey, 2001; Maisto et al., 1999). For example, college students who are exposed to heavy-drinking confederates consume more alcohol than when exposed to light-drinking confederates or no models at all (Borsari & Carey, 2001). Moreover, participants will reduce their drinking rate when in the presence of multiple confederates who are drinking at a slow pace (DeRicco & Niemann, 1980). Thus, it appears that both experimental and nonexperimental studies support modeling as a predictor of drinking in emerging adult samples (Maisto et al., 1999).

Bandura (1969) suggested that alcohol outcome expectancies are positive (e.g., alcohol produces tension reduction) and negative (e.g., alcohol produces a loss of control) beliefs related to the behavioural, affective, cognitive, and physiological effects of alcohol use. As a result of indirect (e.g., via modeling behaviours of parents and peers, and/or alcohol use in the media) and direct experience with drinking, individuals acquire specific expectancies that then influence their decision-making related to future alcohol use. Expectancies are among the strongest predictors of drinking (Goldman, 1999; Jones et al., 2001), and appear to be learned prior to direct experience with alcohol. Indeed, evidence

suggests that children as young as 8-years-old have formed alcohol expectancies (e.g., Miller et al., 1990), and that even individuals who have never consumed alcohol hold specific expectancies related to alcohol use (Leigh, 1987). Reciprocal determinism further suggests that once direct experience with alcohol occurs, expectancies are reinforced by drinking which in turn predict future drinking behaviour (Maisto et al., 1999). This reciprocal relationship has been demonstrated in college students across 1-year assessment periods, where expectancies predict general drinking patterns in college students (Sher et al., 1996). A similar effect is found among romantic partners, where newlywed husbands and wives who endorsed social and physical pleasure expectancies (e.g., "drinking adds a certain warmth to social occasions", or "drinking makes me feel good"; Goldman et al., 1997) for alcohol use are more likely to drink over time (Leonard & Homish, 2008). Researchers have also examined the intervening role of alcohol expectancies in social influences on alcohol use. In a study of college students, Wood et al. (2001) found alcohol expectancies mediated the relationship between social modeling and alcohol use. Moreover, Lau-Barraco et al. (2012) found alcohol expectancies mediated drinking buddies' influence on alcohol use in emerging adults. Thus, it appears expectancies are influenced through social learning processes in emerging adult populations and may explain how peers exert their influence on others. This influence is important as heavy drinking appears to be associated with stronger expectations regarding the reinforcing effects of alcohol consumption (Borsari & Carey, 1999). Emerging adults are also more likely to binge drink alcohol (i.e., engage in heavy episodic drinking) as their positive expectancies related to binge drinking increase (Turrisi, 1999). Indeed, the perceived benefits of drinking are significant predictors of alcohol consumption among university students (Alva, 1998).

Finally, consistent with social learning theory, health behaviours are influenced by

observing the prevalence of risk and protective behaviours in an individual's environment (Berkowitz, 2005). Potential for reward is inferred from perceptions of how uncommon or common a behaviour is. These normative perceptions then guide an individual's behaviour (Baer et al., 1991). Two types of such social norms are related to drinking behaviour. Descriptive norms refer to the perceptions of other's quantity and frequency of drinking and are based on observations of how individuals consume alcohol in drinking situations. Injunctive norms refer to the perceived approval of or attitudes toward drinking among others in one's environment. Individuals are more likely to engage in behaviours perceived to be approved of by others (Cialdini et al., 1991). Individuals also receive normative information from direct communication with others, although this information is often subject to bias via interpretation that is filtered through individual beliefs and attitudes (Borsari & Carey, 2003). As a result, perceived descriptive and injunctive norms related to drinking are often inaccurate. Reviews of the literature suggest that students often overestimate the quantity and frequency of their peers' alcohol consumption (Borsari & Carey, 2003), and this overestimation is related to observation of their peer groups. The same occurs when students evaluate the approval of heavy drinking, where others are viewed as being more accepting of such behaviours than they are (Perkins, 2002). Research also suggests students tend to underestimate peer norms for protective drinking behaviours, such as limiting consumption and pouring their own drinks (e.g., Benton et al., 2008; Lewis et al., 2009). Normative perceptions of heavy alcohol use make it appear common and socially acceptable. Indeed, students with higher descriptive normative perceptions drink in higher quantities (Neighbors et al., 2007; Neighbors et al., 2006). Moreover, greater perceived injunctive norms predict heavy alcohol consumption (Larimer et al., 2004).

In summary, modeling of perceived social norms related to drinking, as well as the

expected effects of alcohol consumption, promote drinking behaviour among emerging adults. Upon witnessing close others drink, individuals' perceptions of the effects of alcohol use and of what is normal drinking behaviour are altered. Social norms and positive alcohol expectancies, in turn, predict escalations in alcohol use (Borsari & Carey, 2003). Along with socialization, another important process is related to alcohol use among social groups, namely selection.

Selection and Socialization

When studying similarity among groups of individuals and dyads, researchers differentiate between selection and socialization (i.e., social learning processes). Selection refers to the process whereby individuals seek out similar others who match their own individual characteristics, typically at the point of relationship formation (McPherson et al., 2001). The term "homophily," first coined by Lazarsfeld and Merton (1954) who analyzed friendship selection among adults, refers to the tendency of friendships to form between those who are alike in some important respect. Indeed, individuals often desire to find others who are similar to themselves, as individuals report that similar others will be more trustworthy (Lincoln & Miller, 1979) and will be more accepting of them (Ibarra, 1995). Moreover, selection refers to a mechanism whereby observed similarities between dyads are the result of individuals choosing and keeping relationships based on whether the beliefs and behaviours of the dyadic partner are similar to their own beliefs and behaviours (Kandel, 1978). Unlike processes of influence (i.e., socialization), where the direction of effect is assumed to flow from the peer to the individual, peer selection is a process in which the direction of the effect is assumed to originate within the individual (Fisher & Bauman, 1988). Peer selection processes are partly explained by social identity theory that holds that 'ingroup versus outgroup' judgments are a fundamental component in psychosocial identity

development and groups that people belong to are an important source of pride and self-esteem (Turner & Tajfel, 1986). During the transition to early adulthood, individuals tend to associate and be affiliated with friends, peers, and romantic partners who are similar to themselves with respect to demographics, attitudes, behaviours, and general lifestyles (Patrick et al., 2016).

Selection of peers based on alcohol use is common; individuals who drink heavily are more likely to seek out friendships with others who are also prone to heavy drinking behaviour (McCabe et al., 2005). Moreover, Leibsohn (1994) found that entering freshman sought out new friends to drink with whose alcohol use patterns were similar to those of their old high school friends. Similarity between individuals and their peers' drinking levels appear because individuals seek out peers whose behaviour and beliefs are consistent with their own (Bullers et al., 2001). Selection effects exist within romantic relationships as well; Wiersma et al. (2011) found that individual adolescent drinking measured six years earlier significantly predicted their current partner's drinking six years later, suggesting participants selected a partner that drank in a similar fashion to themselves. In a longitudinal study of same-sex and mixed-sex friends aged 21 to 24, Andrews et al. (2002) found that friends were similar in terms of their alcohol use at the outset of the study, suggesting selection effects. Bullers et al. (2001) observed larger effects for selection than socialization when investigating the longitudinal influence of network drinking on adult drinking behaviour. White et al. (2008) showed that higher drinking in high school predicted involvement six months later with peers who drank heavily. Leonard and Mudar (2003) investigated newlywed adults' alcohol use and found only selection effects from husbands' initial drinking to their peer networks' drinking one year later. Socialization among newlyweds and their peers did not take place. Thus, it appears that selection plays an important role in the

alcohol use of young people.

Selection and socialization processes are reciprocal and often operate simultaneously (Reed & Rountree, 1997). Schulenberg et al. (1999) proposed a process of selection-based socialization, whereby those who are deviance-prone seek out others who are also deviance-prone (selection) and together the deviance-prone individuals influence each other through shared experiences (socialization). Evidence from adolescents supports a selection-based socialization process, whereby adolescents often select peers who drink similarly to themselves and subsequently escalate their drinking over time together (Simons-Morton, 2007). A study by Kandel (1985) found that social influence and selection effects contributed equally to similarities between the drinking patterns of individuals and their friends. Read et al. (2005) found a reciprocal relationship between social influence variables (including peer alcohol use, related attitudes, and alcohol offers) and alcohol use over three periods of time from the summer before school began to the spring of the sophomore year. Engels et al.'s (1999) five year, three wave study of adolescent alcohol use found evidence of both peer influence and peer selection; however, selection was present during both intervals (wave 1 to wave 2, wave 2 to wave 3), whereas socialization only occurred during the first interval. Reifman et al. (2006) tested college student networks for selection and socialization effects and found both over a one-year period, where specific members of the network who drank heavily predicted individual drinking over time. In terms of selection, wave-to-wave change in average network drinking resulted primarily from individuals with different drinking levels being added to and dropped from the network. Wiersma et al. (2011) found evidence for both selection and socialization in a six-year longitudinal study; adolescent drinking significantly predicted romantic partners' young adult drinking, suggesting young adults may select partners based on drinking behaviours. Moreover,

Wiersma et al. (2011) found partner drinking predicted changes in participants' drinking over time, demonstrating socialization effects. Finally, while Andrews et al. (2002) found primarily selection effects for overall alcohol use among emerging adults, socialization effects were found for binge drinking (i.e., heavy episodic drinking) over time.

In summary, both selection and socialization operate together to account for similarity in alcohol use among emerging adults (Patrick et al., 2016). Through selection processes, individuals choose available environments and peers based on personal characteristics, beliefs, interests, and perceived similarities. Selected peers then provide additional opportunities for socialization and further selection. To disentangle selection from socialization, longitudinal studies are needed given cross-sectional studies cannot speak to change occurring over time due to social influence (Sher, 2016). My dissertation focuses on examining the longitudinal influence of two important dyadic relationships in emerging adulthood: romantic partners and drinking buddies.

Peer Influence as a Predictor of Alcohol Misuse

In the early stages of life, parents confer a strong influence on their children's behaviours and attitudes (Kandel & Andrews, 1987). Parents teach, via socialization processes as well as through direct teaching, the beliefs, behaviours, and attitudes they deem to be socially acceptable. As adolescents grow into young adults, they spend less time with their parents and spend more time with friends (Borsari & Carey, 2001). During this developmental period, young adults begin to rely on peers and partners for support and intimacy as opposed to family members (Paul & Kelleher, 1995). In fact, peers are the major means of support and guidance for most college students, exerting greater impact on behavioural decisions than biological, familial, or cultural influences (e.g., Berkowitz & Perkins, 1986; Borsari & Carey, 2001). One of the most prominent features of emerging

adult social gatherings is alcohol use (Johnson & Gerstein, 2000). Drinking may serve important adaptive functions during this developmental transition, such as assisting emerging adults in making new social connections, demonstrating a mature status, or developing their personal identities (e.g., Chassin et al., 1989; Jessor, 1987). Moreover, emerging adults often select peers who drink at levels similar to their own (Sher et al., 2005). Thus, modeling of alcohol use behaviour becomes the job of the peer network as opposed to the job of the parents as emerging adults begin to form new relationships outside of the home (Bandura, 1971; Paul & Kelleher, 1995).

Research generally supports this developmental shift. In emerging adult samples, peer use of alcohol has consistently been shown to be a significant predictor of regular drinking and hazardous drinking (e.g. Mason et al., 2014; Reifman et al., 1998), and both active (e.g., drink offers) and passive influence (e.g., modeling and norms) from peers has been shown to be uniquely associated with binge drinking and alcohol-related problems (Borsari & Carey, 2001). Indeed, research shows that peer associations are by far the best predictor of binge drinking behaviours among emerging adults (Durkin et al., 2005). Among emerging adult problem drinkers, greater binge drinking is related to having a social network with more heavy drinkers (Delucchi et al., 2008). This finding is true for non-students as well, where the proportion of heavy drinkers in one's network is related to greater personal alcohol use and alcohol-related problems (Lau-Barraco & Collins, 2011). Similarly, the alcohol use of romantic partners has been found to influence binge drinking over the short- and long-term and predict changes in alcohol consumption between adolescence and young adulthood (Bartel et al., 2017; Wiersma et al., 2011).

In summary, as emerging adults move away from the home and begin to create new social circles, the most influential individuals in their environment change. From

adolescence through to adulthood, the influence of peers and romantic partners overtakes the influence of parental figures (Derrick & Leonard, 2016). Moreover, social impact theory (Latané, 1981) postulates that as the importance of individuals within one's social context increases, their influence on the individual increases. Leonard and Mudar (2003) suggest it is the drinking of "key individuals" within the social network of emerging adults that predict individual drinking rather than the entire network. One of these key individuals is the "drinking buddy" (Leonard & Mudar, 2003; Reifman et al., 2006). Drinking buddies are individuals from one's network whom one chooses to drink with (Leonard et al., 2000). Another important influence in the lives of emerging adults is their romantic relationships. In fact, drinking partnership theory suggests couples engage in a drinking partnership where one partner's drinking levels affect the other's in a reciprocal fashion (Roberts & Leonard, 1998). The connection between alcohol use and these important relationships in emerging adulthood is reviewed below.

Drinking Buddies in Emerging Adult Drinking

Certain network members who may have a strong influence on an individual's drinking are those identified as drinking buddies (i.e., a peer/peers from one's network whom one chooses to drink with; Leonard & Mudar, 2003; Reifman et al., 2006). The presence of drinking buddies has been linked to increased alcohol use in emerging adults. Specifically, a prospective study of university students found that the presence of drinking buddies predicted alcohol misuse one year later (Reifman et al., 2006), and this effect was statistically significant even after controlling for baseline alcohol use by the peer network. Moreover, Nogueira-Arjona et al. (2019) found that same-sex drinking buddies drank significantly more in dyadic drinking situations on days when their buddies drank more. This effect was over and above the effect of being in a larger group of drinkers. These studies

support the notion that, beyond the drinking by peers, certain individuals in the network (i.e., drinking buddies) may exhibit an unusually strong influence on individual drinking. Moreover, Leonard et al. (2000) found that, prior to marriage, the social network of heavy drinkers differed considerably from the networks of regular or infrequent drinkers, where 75% of heavy drinkers' networks consisted of drinking buddies compared to only 30% of regular drinkers, and 7% of infrequent drinkers. Similar findings have been demonstrated among newly married couples. Leonard and Homish (2008) examined the social network of newly married couples during the first 4 years of marriage to determine if the number of drinking buddies were longitudinally predictive of heavy drinking and alcohol problems after controlling for a variety of sociodemographic factors. Among both husbands and wives, a greater number of drinking buddies was longitudinally predictive of both heavy drinking and alcohol-related problems over time. In a follow-up study, high levels of heavy drinking were positively associated with more drinking buddies at subsequent assessments over the first seven years of marriage, and the number of drinking buddies one reported predicted his/her spouse's network of drinking buddies over time (Homish & Leonard, 2007). This finding suggests the number of drinking buddies in an individual's network is influenced by their partner's drinking peers and that the social networks of marital partners inter-relate.

The social influence of drinking buddies on alcohol use may be mediated by the individual's normative perceptions of alcohol use by their peers. In other words, it is possible that drinking buddies influence individual drinking by conveying the norm or permissiveness of drinking behaviours in social situations (Borsari & Carey, 2001). In fact, when Lau-Barraco and Collins (2011) examined non-student emerging adult drinking networks, they found the proportion of drinking buddies in an individual's network is directly associated with perceived drinking norms. Moreover, drinking norms were associated with personal

alcohol use, alcohol-related problems, and the approval of drinking generally. Lau-Barraco and Linden (2014) found that among college students, descriptive norms moderated the relationship between drinking buddies and alcohol use. Specifically, if a student perceived a low level of use among their peers, the influence of drinking buddies on drinking quantity was strengthened. However, if the student perceived high levels of use among their peers, the influence of drinking buddies on drinking behaviour was attenuated and they drank in high levels regardless. These findings suggest that the presence of drinking buddies matters for personal alcohol use when individuals have perceptions of low peer drinking, where perhaps individual drinking is influenced by observation of multiple drinking buddies in the absence of elevated norms.

Drinking buddies may also influence alcohol use by influencing an individual's alcohol expectancies and vice versa. Indeed, Homish and Leonard (2007) found that both men and women who had a stronger belief that alcohol was related to positive social functioning at baseline had a greater number of drinking buddies over a seven-year period. This finding suggested the beliefs about the social function of drinking motivates the maintenance of a social network that is supportive of drinking. Lau-Barraco et al. (2012) examined the longitudinal influence of drinking buddies on alcohol outcomes, as mediated by alcohol expectancies of social facilitation among newly married individuals. Results showed alcohol use, heavy drinking, and alcohol-related problems were all prospectively predicted by the number of drinking buddies in the social network, and that this relationship was mediated by alcohol expectancies. Thus, consistent with SLT predictions, drinking buddies exerted their influence on individual drinking behaviour by modeling alcohol expectancies related to social facilitation.

In summary, emerging adults are influenced to drink by specific members in their

social network. The presence of drinking buddies is related to escalations in drinking over time (Reifman et al., 2006). Moreover, drinking buddies likely exert influence on drinking behaviour by modeling alcohol expectancies as well as by increasing normative perceptions of drinking among emerging adults (Lau-Barraco & Linden, 2014).

Romantic Partners in Emerging Adult Drinking

Romantic relationships play a central role in the lives of emerging adults (Gilmartin, 2005), and alcohol use plays an important role in committed relationships (Derrick & Leonard, 2016). Indeed, alcohol use among romantic partners is largely concordant (Ask et al., 2012; Leonard & Homish, 2008; Windle, 1997), which enhances relationship satisfaction (Derrick & Leonard, 2016; Homish & Leonard, 2007). Two important processes are related to alcohol use similarity among couples: assortative mating (i.e., selection) and spousal influence (i.e., socialization). Assortative mating occurs when partners pair with others on traits that are correlated with alcohol use (i.e., social homogamy), or when partners seek out others who are similar or avoid others who are dissimilar in terms of their alcohol use (i.e., phonotypic selection; Rhule-Louie & McMahon, 2007). Research supports assortative mating on alcohol use; longitudinal data suggest that an individual's alcohol use at age 30 could be predicted by their spouse's use 7 years prior, before they had married (Labouvie, 1996). Moreover, Ask et al. (2012) found that couples who would eventually marry were concordant in their alcohol use several years before getting married. Leonard and Eiden (1999) also found an association between partners' alcohol use that remained significant after controlling for demographic variables such as age, race, and socioeconomic status. Thus, it appears that part of the similarity in alcohol use found among couples is due to selection effects.

Spousal influence, conversely, suggests that partners are influenced by each other's

alcohol use over time via social learning processes. Indeed, Roberts and Leonard (1998) suggest couples engage in a "drinking partnership", where one partner's drinking levels affect the other's in a reciprocal fashion. Couples are said to form enduring drinking rituals that become integrated into the relationship. Among married couples, husbands' alcohol use longitudinally predicts wives' drinking at the first marriage anniversary (Leonard & Eiden, 1999; Leonard & Mudar, 2003), whereas wives alcohol use at the first anniversary predicts husband's alcohol use at the second anniversary (Leonard & Mudar, 2004). Gender differences likely disappear over periods of longer than a year, where alcohol use of both husbands and wives longitudinally predicts their partner's alcohol use over four years (Leonard & Homish, 2008). In another study, husbands and wives reciprocally influenced each other's drinking over a five-year period (Windle & Windle, 2014). Similar influence effects are found in couples who are dating. Mushquash et al. (2013) found that partner heavy episodic drinking significantly predicted future individual heavy episodic drinking over a 30-day period. This finding has since been replicated over a 3-year period, with dating couples positively influencing each others' heavy episodic drinking over time (Bartel et al., 2017). In a large sample of emerging adults, Wiersma et al. (2011) found adolescent drinking significantly predicted romantic partners' young adult drinking six years later suggesting individuals selected their partners based on perceived alcohol use similarity. Moreover, partner drinking predicted changes in emerging adult drinking, demonstrating socialization over time. Finally, a comprehensive longitudinal meta-analysis containing 10,553 couples suggested romantic partners influence one another to drink over time, and that female partners conferred a stronger influence than male partners (Muyingo et al., in press). Ultimately, the combined effects of selection and socialization likely result in alcohol use similarity among couples.

Drinking behaviours (Fischer et al., 2007) and the similarity (or discrepancy) of couple drinking patterns for married (Roberts & Leonard, 1998) and dating couples (Wiersma et al., 2009) affect relationship quality. Similarity is validating to both partners because each sees his or her own alcohol attitudes or behaviours in the other (Gonzaga et al., 2007). Validation may socially reinforce the notion that their drinking is normal and just like others. In addition, couple similarity may predict initial romantic attraction (Klohnen & Luo, 2003). Congruence of drinking patterns between partners is associated with relationship satisfaction (Homish & Leonard, 2007), suggesting drinking partnerships may be beneficial to relationship functioning in certain contexts. Partners who drink discrepant amounts of alcohol when compared to each other report lower relationship quality (Mudar et al., 2001; Roberts & Leonard, 1998). Longitudinal studies further suggest that discrepant levels of alcohol use among married couples are associated with relationship dissolution (Leonard et al., 2014). Incongruent drinking partnerships experience steeper declines in marital satisfaction over time when compared to couples where both partners heavy drink and where both do not (Homish & Leonard, 2005). Among dating couples, more similar drinking is characterized by better relationship quality than discrepant drinking (Fleming et al., 2010).

In summary, emerging adults likely select partners based on perceived similarity of a variety of characteristics, including alcohol use (Ask et al., 2012). This similarity-based selection may be particularly important given the relationship between concordant drinking and relationship satisfaction (Derrick & Leonard, 2016). Once in a relationship, partners may further reduce discrepancies between their alcohol use patterns to improve relationship quality (Baumeister & Leary, 1995). This socialization effect is likely strong in emerging adulthood given the importance of romantic relationships in this developmental phase (Latané, 1981; Roberts & Leonard, 1998).

Drinking Motives Theory

It is clear social influence is a key factor in the drinking behaviour of emerging adults. In terms of individual factors, motivations (i.e., reasons for drinking) are important predictors of alcohol use and are likely communicated in social settings. Early motivational models of drinking (Cox & Klinger, 1988) posit that individuals drink to achieve desired outcomes, and these desired outcomes are what provide the decisional framework for consumption. Expected affective changes (i.e., increases in positive emotions and decreases in negative emotions) are thought to drive decisions regarding alcohol use. Cooper (1994) expanded this model and classified motives for drinking based on two distinct factors: their valence (i.e., drinking to achieve a positive reward or avoid a negative consequence), and their source (i.e., drinking to modify their internal state or external environment). Crossing these two dimensions led to four distinct motives: social (positive and external; drinking to increase social affiliation), conformity (negative and external; drinking to reduce/avoid social rejection), enhancement (positive and internal; drinking to experience pleasurable emotions), and coping (negative and internal; drinking to cope with negative affect). More recently, Cooper's four-factor model of motives was modified where the generic coping motive was split into distinct coping-depression and coping-anxiety factors (Grant et al., 2007). Research has shown that these two coping motives are factorially distinct and have distinct correlates in terms of their drinking outcomes (Grant et al., 2009; Grant et al., 2007). Kuntsche et al. (2005) surveyed more than 13,000 individuals and determined that social motives are endorsed most often, followed by enhancement, coping, and conformity motives, respectively. This rank order of endorsement has been consistent across studies and groups, including college students (Neighbors et al., 2004; Stewart et al., 1996) and adults (Crutzen & Kuntsche, 2013).

Researchers suggest individuals who are strongly motivated to drink for any reason drink more, drink more often and have more alcohol-related problems as a result (Cooper, 1994; Kuntsche et al., 2005). Motivational approaches further posit that the particular reason that a person drinks matters and is predictive of distinct drinking behaviours (Cooper et al., 2016). Indeed, drinking motives predict both alcohol use and alcohol-related problems in emerging adulthood (Simons et al., 2005), and strong endorsement of any motive is related to increased alcohol use (Cooper et al., 2016). However, some drinking motives are riskier than others in terms of their association with alcohol outcomes. Enhancement motives are the most stable predictors of heavy alcohol consumption (Cooper, 1994; Cooper et al., 2016). Indeed, in an examination of 28 studies, Cooper et al. (2016) found enhancement motives were related to frequency and quantity of alcohol use, and indirectly related to alcohol-related problems. In contrast, social motives are modestly associated with drinking quantity and frequency but are unrelated to binge drinking and alcohol-related problems (Cooper et al., 2016). The generic coping motive is related to frequency of alcohol use, as well as directly and indirectly related to alcohol-related problems (Cooper et al., 2016). When divided into distinct coping motives, coping-depression and coping-anxiety motives are significant predictors of alcohol-related problems, but only coping-with anxiety motives directly predict alcohol-related problems after accounting for alcohol consumption levels (Grant et al., 2007). Conformity motives are negatively associated with drinking quantity and frequency yet positively related to alcohol-related problems (Cooper et al., 2016). A large body of literature supports the basic premise of the motivational model of alcohol use (Cooper et al., 2016; Cox & Klinger, 1988), and suggests that individuals use alcohol to regulate the quality and intensity of their emotions and to obtain valued social outcomes.

Drinking Motives within a Social Context

The decision to drink is embedded within the context of one's life and experiences (Cox & Klinger, 1988). Among a range of factors, the sociocultural environment plays a role in whether a person is motivated to drink or not. Such factors include being alone or with others, and whether individuals in the immediate environment support alcohol use or discourage it. Perceived indirect effects of alcohol use tend to be social in nature (i.e., social facilitation, increased bonding, avoidance of social disapproval) and the balance between positive and negative expectancies motivate individuals to drink or avoid drinking. Indeed, one of the sources of drinking motivation is social in nature, where individuals are motivated to enhance their connection to others (i.e., social motives) or gain approval from socially significant others (i.e., conformity motives) via alcohol use (Cooper, 1994). Alcohol expectancies can also be social in nature (e.g., alcohol enhances social functioning, alcohol reduces social functioning) and are often compared to drinking motivations given both focus on the predicted consequence of drinking (Baer, 2002; Cooper, 1994). However, expectancies are related to positive and negative beliefs and may or may not result in drinking, whereas drinking motives directly measure alcohol use aimed at achieving a desired outcome (Cooper, 1994). As such, some expectancies can be protective in nature whereas drinking motives are stronger predictors of alcohol use as they are contingent upon actual drinking behaviour (Wiers et al., 2016). Indeed, motivational models of alcohol use assert that motives are the final step toward drinking behaviour, while alcohol expectancies influence drinking by way of shaping an individual's drinking motives. Evidence supports this hypothesis, where drinking motives mediate the link between alcohol expectancies and alcohol-related outcomes (Cooper et al., 1995; Kuntsche et al., 2010).

While alcohol expectancies have been researched within a social context extensively (see previous review), drinking motivations have not received as much attention within the

social context. In terms of social setting, individuals who endorse social motives for drinking are more likely to drink at parties and with groups of friends, and are less likely to drink alone (Cooper, 1994; Cooper et al., 1992). Moreover, Lee et al. (2007) showed that those who were socially motivated to drink and were embedded in heavy drinking subculture drank the most and experienced the most problems, defying the notion that social motives are always non-risky. Conformity motives are also linked to drinking at parties and are negatively related to drinking at home (Cooper, 1994). Social relationships and interaction are one of the most powerful sources of reward in humans (Reis et al., 2000), and as such enhancement-motivated drinkers might seek to enhance their emotional experience in social settings. However, given enhancement is also an internally-focused motive, there are likely other situations (besides social contexts) in which pleasant experiences might occur. Consistent with this idea, drinking for enhancement reasons is linked to drinking in some social settings (e.g., in bars, drinking with same-sex friends) but unrelated to others (e.g., with mixed-sex friends; Cooper, 1994; Kuntsche & Cooper, 2010). Coping motivated drinkers, conversely, tend to drink at home and alone (Cooper, 1994; Kuntsche & Cooper, 2010). This finding is consistent with the idea that individuals who drink to cope are internally focused on negative emotions and may withdraw socially as a result (Anderson & Harvey, 1988). Thus, it appears drinking motives are related to the social setting individuals choose/choose not to drink in.

Smith et al. (1993) found that social and coping motives were associated with having friends who drank more heavily. Given these results, the authors suggested an individual's social network likely influences not only behaviour, but also the motives that precede behaviour. Indeed, limited prior work suggests drinking motives confer influence among adolescents and emerging adults via a socialization process. Kuntsche and Stewart (2009)

found that individual drinking motives (enhancement, conformity, coping, and social) were positively predicted by classmate motives in a sample of 12- to 18-year-old students, demonstrating drinking motives can be transmitted via peer social influence. Further work suggests that drinking motives of an adolescent's peer-group can influence an adolescent's drinking levels by way of impacting the adolescent's own drinking motives (Stewart et al., 2014). Finally, Hussong (2003) utilized a prospective, 28-day design in friendship dyads to show college student's alcohol use was influenced by their own drinking motives as well as the drinking motives of their friend. Thus, it appears limited prior work supports the notion suggested by Smith et al. (1993), where drinking motives influence not only the individual, but persons in the individual's environment as well.

Summary

Alcohol use is intricately woven into the fabric of social relationships. Humans have been drinking alcohol for thousands of years, and alcohol has played an important role in cultural cohesion across the world (Dietrich et al., 2012; Douglas, 1987). The endorphin release associated with alcohol use has likely worked to bond humans together and strengthen evolutionary fitness as a result (Gianoulakis, 2004; Machin & Dunbar, 2011). Moreover, feelings of closeness, social facilitation, and belonging are particularly relevant to emerging adults who are likely building new relationships outside of the home during this developmental period (Martin & Hoffman, 1993).

SLT posits that emerging adults obtain their alcohol-specific social norms and expectancies from influential role models such as their and peers and romantic partners (Bandura, 1977). SLT hypothesizes that emerging adults come to form these specific attitudes and beliefs through observation of valued role models. Emerging adults then imitate the observed behaviours, which are reinforced by their social environment. As a result of

social reinforcement, expectations for positive consequences develop (Akers, 1985; Bandura, 1977; Bauman & Ennett, 1994; Read et al., 2005). Moreover, a selection-based socialization process likely occurs, where emerging adults select individuals who they perceive drink in similar quantities as themselves, and subsequently escalate their drinking over the length of their relationship through socialization processes (Simons-Morton, 2007; Wiersma et al., 2010). While overall social network drinking is associated with emerging adult drinking, specific individuals within the network appear to be particularly influential models. Both drinking buddies (Lau-Barraco & Linden, 2014) and romantic partners (Wiersma et al., 2010) are highly valued individuals to emerging adults. As a result, they seem to confer particularly strong influence on drinking behaviour, as well as on alcohol expectancies and perceived drinking norms (Bartel et al., 2017; Lau-Barraco & Collins, 2011; Leonard & Homish, 2008).

Expectancies around the utility of alcohol use, as well as descriptive and injunctive norms, are often modeled between individuals (e.g., Borsari & Carey, 2001; Lau-Barraco et al., 2012). Thus, it is plausible to assert that emerging adults may model drinking motivations as well. SLT would suggest that the observation of drinking motives that are rewarded in valued peers and romantic partners would result in adoption of those same motivations, and the behaviours that follow. Adoption of motivations could occur via active exchange (e.g., verbalizing how alcohol enhances positive emotions) or via passive learning (e.g., witnessing a partner/drinking buddy drink after expressing or displaying feelings of sadness). Little research has investigated drinking motivations in this way. This is an important gap in the literature given how drinking motives are strong predictors of heavy alcohol use (Cooper et al., 2016). Moreover, given both alcohol expectancies and norms are related to the perceived consequences of alcohol use, it is logical that drinking motives

would operate in a similar fashion among peers and romantic partners. However, no prior research has investigated drinking motives within romantic or drinking buddy relationships. Given how influential both these relationships are to emerging adult drinking (Gilmartin, 2005; Lau-Barraco & Linden, 2014), and given the high rates of heavy drinking and alcohol-related problems found among young adults (ACHA, 2016; Park et al., 2006), this is an important topic that requires more investigation.

Dissertation Aims

My dissertation's primary goal was to investigate SLT, drinking motives theory and alcohol use within the context of interpersonal relationships. Because they often drink heavily and experience a multitude of alcohol-related problems, I chose to focus on emerging adults. Each of my studies sought to accomplish the following:

Study 1

Entitled "*Similarity in romantic couples' drinking motivations and drinking behaviors*", Study 1 (Kehayes et al., 2017) investigated whether romantic couples are similar in terms of their drinking motives and drinking behaviours, and whether variables representing time spent drinking together predicted similarity. This brief study utilized cross-sectional data analysis and sampled emerging adult romantic couples (mixed-sex and same-sex couples). Social learning theory suggests the more time individuals spend together, the more likely they are to adopt observed reinforced behaviours (Bandura, 1977). Our study sought to confirm whether couples are indeed similar in their drinking behaviours (given mixed findings; Kolonel & Lee, 1981; Stimpson et al., 2006) and whether this similarity extends to the motivations underlying drinking (Cooper, 1994). Based on social learning theory, we hypothesized romantic partners would be more similar to one another in their drinking motives and drinking behaviours than expected by chance. Moreover, most of the

drinking similarity literature focuses on the outcomes of similarity (e.g., Wiersma & Fischer, 2014) and less on the potential predictors of similarity. Based on SLT, we hypothesized four variables reflecting time spent drinking together would be related to both drinking motive and drinking behaviour similarity (cohabitation status, relationship length, days per week with face-to-face contact, and days per week spent drinking together). Finally, we predicted that both types of similarity would be positively related given drinking motive similarity may underlie drinking behaviour similarity in couples.

Study 2

Entitled "*Drinking motives and drinking behaviors in romantic couples: A longitudinal actor-partner interdependence model"*, Study 2 (Kehayes et al., 2019) investigated whether romantic partners influenced each other to drink via their drinking motivations. This study utilized the same longitudinal data collected over a 4-wave, 4-week period used in Study 1 that sampled emerging adult romantic couples. Previous research suggested that couples influence each other to drink over time via their overt drinking behaviours (Mushquash et al., 2013). However, no one had investigated whether the motivations underlying a romantic partner's drinking behaviour could influence an individual to drink alcohol. We ran APIMs within a multilevel model framework to test whether individuals were influenced to drink not only by their own drinking motives, but by their romantic partner's drinking motives as well. We also investigated whether this influence occurred via change in the individual's own drinking motivations. This potential mediator would provide a mechanism through which partner drinking motives exert influence on individual drinking behaviour (Bandura, 1977). We hypothesized an individual's and their romantic partner's enhancement motives and social motives would positively predict the individual's drinking behaviours. These hypotheses were derived from

drinking motives theory (Cooper, 1994; Cooper et al., 2016), as well as social learning theory (Bandura, 1977).

Study 3

Entitled "*The influence of drinking buddies: A longitudinal investigation of drinking motivations and drinking behaviors in emerging adults*", Study 3 investigated whether drinking buddies influenced each other to drink via their drinking motivations and was a replication of Study 2 (Kehayes et al., 2019). This study utilized longitudinal data collected over a 4-wave, 4-month period that sampled emerging adult drinking buddies. The purpose of this study was to replicate and extend findings from Study 2 in another important emerging adult relationship. Moreover, we improved upon past research (e.g., Hussong, 2003) by utilizing longitudinal methodology and the APIM, by utilizing two distinct measures of drinking behaviour (frequency and quantity) and by investigating mediation via change in individual drinking motivations. We hypothesized the individual's and the drinking buddy's enhancement, social, and coping-anxiety motives would positively predict individual drinking behaviours. Specific drinking motive hypotheses were derived from drinking motive theory (Cooper, 1994; Cooper et al., 2016), social learning theory (Bandura, 1977), and Study 2's findings (Kehayes et al., 2019). Sex was also explored as a potential moderator of our APIM analyses.

Outline

Each study is presented in turn in the upcoming chapters. Study 1 can be found in Chapter 2, Study 2 in Chapter 4, and Study 3 in Chapter 6. Transitions between studies can be found in Chapters 3 and 5, respectively. An integrative discussion of my dissertation's findings can be found in Chapter 7, including clinical and theoretical implications.

CHAPTER 2. STUDY 1: SIMILARITY IN ROMANTIC COUPLES' DRINKING MOTIVATIONS AND DRINKING BEHAVIORS

The manuscript prepared for this study is presented below. Readers are advised that Ivy-Lee Kehayes, under the supervision of Dr. Sherry Stewart and Dr. Sean Mackinnon, was responsible for developing the research hypotheses, collecting the data, preparing the dataset for analyses, conducting the analyses, and interpreting the study results. Ivy-Lee wrote the initial draft of the manuscript; she received and incorporated feedback from her co-authors. The manuscript then underwent peer-review. Ivy-Lee responded to reviewers and led each round of revisions. The manuscript was accepted to be published in the journal *Substance Abuse* on April 4, 2017. See Appendix A for copyright permission from the publisher (Taylor & Francis) to include this paper in the thesis. The full reference is as follows: Kehayes, I. L., Mackinnon, S. P., Sherry, S. B., Leonard, K. E., & Stewart, S. H. (2017). Similarity in romantic couples' drinking motivations and drinking behaviours. *Substance Abuse, 38,* 488-492.

Abstract

Background: Research suggests enhancement, conformity, social, coping-anxiety, and coping-depression drinking motives are linked to specific drinking outcomes in a theoretically-expected manner. Social learning theory suggests people who spend more time together emulate each other's behaviour to acquire reinforcing outcomes. The present study sought to integrate drinking motives theory and social learning theory to investigate similarity in drinking behaviours and drinking motives in romantic couples. We hypothesized couples would be more similar than chance in their drinking behaviours and motives. We also hypothesized demographics reflecting time around and interactions with romantic partners (e.g., days spent drinking together) would positively correlate with similarity in drinking behaviours and motivations. *Methods:* The present study tested hypotheses in 203 romantic couples. Participants completed a Timeline Follow-Back measure and the Modified Drinking Motives Questionnaire-Revised to track their alcohol use and drinking motives. Similarity profiles were calculated using McCrae's (2008) coefficient of profile agreement, r_{pa}. *Results:* Couples were more similar in their drinking behavioural and motivational profiles than could be explained by chance. Days spent drinking together and days with face-to-face contact predicted increased similarity in drinking behaviour profiles, but not similarity in drinking motives profiles. *Conclusions:* Results are partially consistent with social learning theory and suggest social influences within couples could be important intervention targets to prevent escalations in drinking.
Keywords: romantic couples; drinking motives; alcohol use; similarity; social learning theory

Introduction

Drinking motives theory suggests individuals drink to achieve desired outcomes, and each of the five drinking motives (i.e., social, conformity, enhancement, coping-anxiety, and coping-depression) predict different patterns of alcohol use and alcohol-related problems (Cooper, 1994; Grant et al., 2007). Though research links drinking motives to alcohol use and problems (Cooper et al., 2016), few studies have examined drinking motives within a social context (Homish & Leonard, 2007). We examined the impact romantic partners have on both drinking behaviour and motives.

Romantic couples are similar in many different domains (Ask et al., 2012; McPherson et al., 2001; Stimpson et al., 2006). One of the processes that influences similarity within a couple is socialization, where individuals become more similar to others in their social network over time. Socialization can be explained by social learning theory; when we observe the motivations and behaviours of others that are reinforced, we adopt those motivations and behaviours ourselves (Akers, 1985; Bandura, 1977). The more time members of a couple spend together, the more likely they are to emulate their partner's behaviour (Ask et al., 2012; Bove et al., 2003; McPherson et al., 2001). Roberts and Leonard (1998) suggest couples engage in a "drinking partnership", where one partner's drinking levels affect the other's in a reciprocal fashion. As evidence of this, romantic partners influence each others' heavy episodic drinking over periods up to three-years, suggesting heavy drinking should be considered a couples' issue instead of just an individual issue (Bartel et al., 2017). Drinking partnerships have also been associated with relationship satisfaction, with heavy drinking couples typically reporting less satisfaction (Linden-Carmichael et al., 2016) and increased intimate partner violence (Wiersma et al., 2010). Moreover, discrepancy in drinking within couples is associated with more alcohol-related

problems and consequences over time (Wiersma & Fischer, 2014).

While socialization seems to influence drinking *behaviours* among couples (Stimpson et al., 2006), the influence of romantic relationships on emerging adults' drinking *motives* is unstudied. One study of peer influence found drinking motives (enhancement, conformity, coping, and social) in 12 to 18-year old students were positively associated with classmates' motives (Kuntsche & Stewart, 2009), suggesting transmission via peer social influence. Drinking motives are theorized to be the most proximal influence on drinking behaviour, and are the route by which other more distal influences (e.g., peers) predict alcohol consumption (Cooper, 1994; Kuntsche et al., 2008). It is important to investigate how motives can be influenced by others since they have a direct impact on heavy drinking behaviour and alcohol-related problems. If similar drinking motives are found within couples, this would suggest that risky drinking motives should be targeted in treatment at the couple level instead of only at the individual level.

Given previous research showing the importance of drinking behaviour in romantic couples (Linden-Carmichael et al., 2016; Roberts & Leonard, 1998; Wiersma et al., 2010; Wiersma & Fischer, 2014), we investigated whether couples are similar in drinking behaviours and as well as drinking motivations. While drinking behaviour similarity has been investigated in couples, prior research largely focuses on the *outcomes* associated with increased similarity (e.g., increased relationship satisfaction; Roberts & Leonard, 1998) and less on *predictors* of couples' similarity. Four variables reflecting time spent together were explored as predictors of similarity: cohabitation status, relationship length, days/week with face-to-face contact, and days/week spent drinking together. All predictors can be understood as various measurements of time the couple spends with each other. Thus, based on social learning theory, these predictors should all be related to similarity within the couple

(Bandura, 1977). Based on social learning theory, we hypothesized romantic partners would be more similar to each other in their drinking behaviours and drinking motivations than expected by chance. Further, we hypothesized that the predictors listed above would be positively related to couples' drinking behaviour and motive similarity. Finally, we predicted similarity in drinking motives and drinking behaviours would be positively related, given arguments that social influences on behaviour may be mediated through social influences on motives (Bandura, 1977).

Methods

Participants

Romantic dyads were recruited in two samples (N_1 = 101; N_2 = 102 couples), and were both recruited from the community and via the university's psychology research pool using similar recruitment strategies. Data from both samples were combined. The combined sample consisted of 203 couples (187 [92%] mixed-sex, 14 [7%] same-sex female, 2 [1%] same-sex male). Participants' mean age was 22.6 (*SD* = 5.5) years. Most were students (59.2%) and Caucasian (83.5%). Couples were in a relationship for an average of 2.3 years (*SD* = 2.4, range = 3 weeks to 15.7 years) and had frequent face-to-face contact with their partner (*M* = 6.2, *SD* = 1.4 days/week); 91.6% were dating and 8.4% were married. Two research papers have been published from this dataset.[1]

Materials

[1]Since the publication of this manuscript, five research papers have been published utilizing this dataset. The first examined dyadic conflict, coping-depression drinking motives, and alcohol-related problems (Lambe et al., 2015). The second examined conflict, well-being, and perfectionism in couples (Mackinnon et al., 2017b). The third examined similarity in couples' drinking motives and behaviour (Kehayes et al., 2017). The fourth utilized partner informant reports to examine alcohol-related problems and dyadic conflict in couples (Farrelly et al., 2019). The fifth was Study 2's manuscript (Kehayes et al., 2019).

Demographic Questionnaire

This questionnaire assessed participants' demographic characteristics (e.g., age, sex) and details about their relationship length, whether they were cohabitating (yes/no), and how many days they had face-to-face contact with their partner over the past week.

Modified Drinking Motives Questionnaire- Revised (Modified DMQ-R; see Appendix B)

Drinking motives were measured once a week for four weeks using the 28-item Modified DMQ-R, 7-day version (Lambe et al., 2015). The DMQ-R is a self-report measure with five subscales: coping-anxiety, coping-depression, enhancement, conformity, and social motives. When averaged across all four weeks, internal consistencies (αs) ranged from good to excellent (.80 [coping-anxiety] to .95 [coping-depression]).

Self-Administered Timeline Follow-Back (STLFB; see Appendix C)

Alcohol consumption was measured using the STLFB once a week for four weeks (Collins et al., 2008). The STLFB is a self-report calendar used to track alcohol intake over the past 7 days. Participants indicated the days they drank, how many standard alcoholic beverages (i.e., 14g pure alcohol; National Institute on Alcohol Abuse and Alcoholism, 2003a) they had that day, and with whom they drank. STLFB data was used to calculate quantity of drinks consumed per occasion, number of drinking days, and days spent drinking with their partner.

Binge Drinking.

Binge drinking was measured once a week for four weeks in a manner consistent with published recommendations (National Institute on Alcohol Abuse and Alcoholism, 2003b) The scale, which has been used previously (Mackinnon et al., 2011), asked: "During the past 7 days, how often did you have *5 (men)/4 (women)* or more drinks containing any kind of alcohol within a 2-hour period?"

Procedure

All procedures were approved by a university research ethics board. Sample 1 participants completed paper and pencil questionnaires in the laboratory; Sample 2 participants completed all follow-up surveys online at home. The change in methodology from Sample 1 to Sample 2 was implemented to increase retention. Both samples were recruited from the community via posters, online advertisements, and the psychology research participant pool. Couples were recruited for both samples only if they were: (a) in a current romantic relationship (no restriction on length of relationship) and (b) each partner drank at least 12 alcoholic drinks in the past year. These criteria were used to ensure all couples were engaging in drinking behaviour and were actively in a relationship (Mackinnon et al., 2017b). Participants recruited in Sample 2 were also required to have regular internet access at home to complete the follow-up surveys online. Couples provided informed consent and completed questionnaires online or in the laboratory once a week over four consecutive weeks. Retention rates were high across waves two (89.2%), three (82.7%), and four (82.1%), with 81.8% of participants completing all four waves. At study completion, participants were debriefed and provided course credit or monetary compensation.

Data Analytic Strategy

Due to the short, one-week time-lags, we did not expect much change in drinking behaviour or motivations over time. All analyses utilized variables that were aggregated across the four study weeks. Thus, while we did not assess longitudinal changes, we did use all available data to reduce measurement error. Similarity profiles were calculated for drinking behaviour and motives using the coefficient of profile agreement r_{pa} (McCrae, 2008). There are other measures of profile agreement among dyads, such as taking the absolute value of the difference between two scores, or correlational methods such as

Pearson *r* or the ICC (Furler et al., 2013; Furler et al., 2014). However, r_{pa} has been shown to be superior to these alternative methods because it is sensitive to both the distance between two scores and also to the extremeness of their means (McCrae, 1993, 2008). This coefficient allows researchers to create a profile of similarity where multiple variables are combined into an overall similarity construct. The r_{pa} profile values can range from -1 to +1, with positive numbers indicating couples are more similar and negative numbers indicating they are less similar. For example, a high, positive drinking motives similarity profile would indicate both members of the couple had elevations or low scores on the same subscales, whereas a high, negative similarity profile would indicate each partner had elevations and low scores on different subscales. Two separate similarity profiles were calculated for each dyad. The first profile was comprised of three measurements of drinking behaviour: Frequency of days spent drinking, quantity of alcohol consumed, and frequency of binge drinking. The second profile was comprised of subscale totals for all five drinking motives. Bivariate correlations were calculated to test potential predictors of similarity within couples. One-sample *t*-tests were calculated to test if similarity profiles were greater than expected by chance (i.e., 0). Robust 95% confidence intervals were calculated for *t*-tests and correlations using bias-corrected and accelerated bootstrapping with 5,000 resamples using SPSS 22 software.

Results

After averaging across four weeks, two variables had missing data: drinking motive similarity (9.85%) and relationship length (5.42%). Missing data were handled with listwise deletion, resulting in 183 couples for the one-sample *t*-tests and 175 couples for the bivariate correlations. One-sample *t*-tests demonstrated couples were more similar in their drinking motivations and behaviours than expected by chance. The similarity profile for drinking

behaviour was positive (M = .52, SD = .25) and significantly greater than zero, $t(182)$ = 28.23, p < .001, 95% CI r_{pa} [.48, .55], d = 2.09. The drinking motive similarity profile was also positive (M = .25, SD = .36) and significantly greater than zero, $t(182)$ = 9.58, p < .001, 95% CI r_{pa} [.20, .30], d = 0.71. Means, standard deviations, and bivariate correlations appear in Table 2.1. Appendix D (Table D.1) contains detailed supplementary descriptive statistics. Most variables were correlated in the expected manner. All four predictors were significantly correlated with one another, save days spent drinking together with relationship length. Partially consistent with hypotheses, drinking behaviour similarity was correlated with both days spent drinking together and days with face-to-face contact. Contrary to hypotheses, drinking motive similarity was unrelated to all four predictors. Also contrary to expectation, drinking motive similarity was unrelated to drinking behaviour similarity.

Discussion

Given previous research on the importance of alcohol consumption in romantic relationships (Linden-Carmichael et al., 2016; Roberts & Leonard, 1998; Wiersma et al., 2010; Wiersma & Fischer, 2014), the present study sought to investigate similarity of both drinking behaviour and drinking motivations in romantic couples. Results suggested couples are more similar in their drinking behaviour profiles than expected by chance, consistent with prior research on alcohol consumption similarity in couples (Kolonel & Lee, 1981; McLeod, 1993; Stimpson et al., 2006;). Our study employed a novel measurement of drinking behaviour similarity that combined binge drinking, alcohol quantity, and frequency of drinking days into a single drinking profile. Conversely, other studies that found discrepant drinking among partners only used drinks consumed (Kolonel & Lee, 1981). Individuals may be more likely to adopt the overall drinking pattern their partner is modeling instead of their alcohol quantity specifically.

Couples were also more similar than chance in their drinking motives. This result contributes to the drinking motives literature by drawing attention to social, rather than individual (e.g., personality), determinants of drinking motives. Thus, our study adds to the emerging literature on social influence in drinking motives (Hussong, 2003; Kuntsche & Stewart, 2009) and suggests couples are similar not only in their drinking behaviours, but also in their reasons for drinking.

Drinking behaviour similarity was positively correlated with both days spent drinking together and days spent with face-to-face contact, but not with cohabitation status or relationship length. This finding is partially consistent with predictions, as the more time couples spent in contexts where they could observe one another's drinking, the more similar they were in their overall drinking behaviours (Bandura, 1977). Unexpectedly, drinking behaviour similarity was not associated with drinking motive similarity. Thus, the influence partners have on each other's drinking behaviour patterns is likely context driven (i.e., time spent drinking together as a drinking context). Although couples were similar in their drinking motive profiles, drinking motive similarity was not significantly correlated with any predictor. It is possible that there are social learning influences on specific motives (e.g., external, rather than internal motives; Cooper, 1994). This distinction is not captured with our overall motives similarity profile – and indeed, is not possible to examine with this approach. Future research should investigate similarity in specific motives to better examine this possibility. Further, while the correlational results are inconsistent with a social learning explanation for similarity in couples' drinking motive profiles, it is possible individuals may have selected a partner with similar drinking motives at the onset of their relationship.

We were unable to tease apart socialization versus selection effects (i.e., the process whereby individuals choose others who match their own individual characteristics) because

we did not assess drinking motives or drinking behaviours in individuals prior to their relationship formation (McPherson et al., 2001). We also did not model change over time, so we could not speak to issues of causality. However, we improved on typical cross-sectional designs by using repeated-measures to reduce measurement error. Finally, our sample mainly consisted of young, dating, student couples so results may not generalize to other dyads (e.g., older married couples, peer dyads).

The similarity found in couples' drinking behaviour and motive profiles highlights the importance for clinicians to address alcohol use concerns within couples as well as within the individual. Behavioural couples therapy has been shown to improve relationship functioning and produce greater abstinence from alcohol than individual-based treatment (O'Farrell & Clements, 2012). Our results further highlight the importance of addressing an individual's social network when attempting to lower risky drinking behaviour and motives. Overall, our results provide novel evidence of similarity in drinking motive profiles within romantic couples and provide incentive for research clarifying the mechanisms and consequences of such motives similarity in dyads.

Table 2.1. Means, Standard Deviations, and Bivariate Correlations.

	M	*SD*	Possible Range	1	2	3	4	5	6
1. Drinking behaviour similarity	.52	.24	-1 – 1	--	.11 [-.04, .25]	**.29 [.16, .40]**	**.17 [.03, .32]**	.02 [-.14, .17]	.06 [-.09, .21]
2. Drinking motive similarity	.25	.36	-1 – 1		--	.10 [-.05, .24]	-.04 [-.17, .10]	.03 [-.11, .15]	-.03 [-.18, .12]
3. Days spent drinking together	1.30	1.17	0 – 7			--	**.31 [.21, .40]**	.09 [-.06, .25]	**.24 [.10, .37]**
4. Days with face-to-face contact	6.02	1.31	0 – 7				--	**.22 [.12, .31]**	**.55 [.45, .64]**
5. Relationship length (years)	2.37	2.45	0.06 – 15.71					--	**.32 [.23, .42]**
6. Cohabitation status	.47	.50	0 or 1						--

Note. Cohabitation status was coded as "0" indicating no cohabitation and "1" indicating cohabitation, with the presented mean indicating the proportion of couples that were cohabitating (i.e., married or dating and cohabitating). All correlations were performed using Pearson's *r*. Confidence intervals are based on 5,000 bootstrapped resamples. Bolded correlations are significant (i.e., do not contain zero within their confidence interval).

CHAPTER 3: TRANSITION FROM STUDY 1 TO 2

As established in the introduction to this dissertation (Chapter 1) and to Study 1 (Chapter 2), romantic couples often report similar levels of alcohol consumption as their romantic partners. Drinking partnership theory (Roberts & Leonard, 1998) suggests couples influence each other to drink reciprocally, and that this reciprocity maintains relationship functioning. Researchers have shown that couples select partners whose drinking is similar to their own (Ask et al., 2012) and influence each other to drink over time (Muyingo et al., in press). Selection of similar partners is thought to promote relationship satisfaction (Derrick & Leonard, 2016; Homish & Leonard, 2007).

Given drinking behaviour similarity had been studied previously among couples, the goal of Study 1 was to investigate drinking behaviour similarity alongside drinking motives similarity, something that had not been studied in romantic couples to date. Drinking motives are important predictors of drinking behaviour among individuals, and individuals who drink for certain motivations are at increased risk for drinking heavily and experiencing alcohol-related problems (Cooper et al., 2016). While motives are predictive of individual drinking, they had rarely been studied in dyads previously (Hussong, 2003; Kuntsche & Stewart, 2009; Stewart et al., 2014). Study 1 established that drinking behaviour was concordant among couples and was related to how often the couples drank together, and how often they spent time together generally. Importantly, couples were also similar in their overall drinking motivations, although this similarity was unrelated to how often they spent time together drinking or in face-to-face contact with each other. This finding suggested that romantic couples were similar in not only their drinking behaviours, but in the motivations driving their drinking as well.

Given drinking motives had rarely been studied in romantic couples previously, I

wanted to first establish in Study 1 that couples report similar drinking motives before moving on to a more complex investigation of motives within couples. Furthermore, I was unable to differentiate between selection and socialization in Study 1. Thus, couples may have originally selected each other based on similarity in drinking behaviour or drinking motives, they may have become similar in their drinking and motives as their relationship progressed, or a combination of both. Moreover, cross-sectional analyses are unable to speak to directionality, making it difficult to establish whether drinking motive similarity predicted increased days spent drinking together or vice versa, for example (Reifman et al., 2006). Recruiting couples longitudinally over 4 weeks allowed for tests of co-occurring change over time, a clear improvement on correlational analyses and something I was immediately interested in testing given the similarity found among couples in Study 1.

Moreover, overall drinking motive similarity was unrelated to overall drinking behaviour similarity in Study 1. Thus, I wanted to investigate whether individual drinking motivations are instead predictive of individual drinking behaviour. Investigating individual motives would improve upon Study 1's investigation of overall drinking motives given specific motives are associated with specific patterns of drinking behaviour (Cooper et al., 2016). Moreover, by utilizing longitudinal data and the APIM, I could improve upon Study 1's cross-sectional analyses that were unable to evaluate individual motive influence over time. Thus, to further study drinking motives theory (Cooper, 1994) from a social influence perspective (Bandura, 1977), and to extend drinking partnership theory (Roberts & Leonard, 1998), my goal in Study 2 was to investigate whether couples influence each other to drink via individual drinking motivations over time.

The literature on drinking in romantic couples to date has established quite consistently that couples influence each other via overt drinking behaviours (Muyingo et al.,

in press). As reviewed in the introduction of my dissertation (Chapter 1), one of the theories underlying this influence is SLT (Bandura, 1977), where couples are vicariously reinforced to drink after witnessing their partner's drinking behaviour and its consequences. For example, dating couples positively influence each other's heavy episodic drinking over a 3-year period (Bartel et al., 2017). Drinking influence also occurs over shorter time periods, such as 30 days (Mushquash et al., 2013). It is unclear if motives within dyads operate in a similar fashion. Drinking motives theory suggests enhancement motives and social motives are most consistently related to drinking behaviour (Cooper et al., 2016). Therefore, I hypothesized those specific motives would influence individual drinking behaviour, as well as partner drinking behaviour. Because my couples data were longitudinal, and I did not complete any longitudinal analyses in Study 1, I investigated whether drinking motives resulted in increased alcohol use over time, as well as when averaged over time using multilevel modeling. Utilizing multilevel models allowed for tests of co-occurring change over time, a socialization process (Bandura, 1977). Finally, if drinking motives were shown to influence romantic partners to drink, I planned to investigate whether change in individual drinking motives mediated such influence. Investigating a mediator would provide a mechanism through which drinking motives exert their influence on partner drinking behaviour.

CHAPTER 4. STUDY 2: DRINKING MOTIVES AND DRINKING BEHAVIORS IN ROMANTIC COUPLES: A LONGITUDINAL ACTOR-PARTNER INTERDEPENDENCE MODEL

The manuscript prepared for this study is presented below. Readers are advised that Ivy-Lee Kehayes, under the supervision of Dr. Sherry Stewart and Dr. Sean Mackinnon, was responsible for developing the research hypotheses, collecting the data, preparing the dataset for analyses, conducting the analyses, and interpreting the study results. Ivy-Lee wrote the initial draft of the manuscript; she received and incorporated feedback from her co-authors. The manuscript then underwent peer-review. Ivy-Lee responded to reviewers and led each round of revisions. The manuscript was accepted to the journal *Psychology of Addictive Behaviors* on February 7, 2019. The published manuscript won the Durand Jacobs Award from McGill University, which is awarded to the best graduate student paper related to the psychology of addictive behaviours. See Appendix E for copyright permission from the publisher (American Psychological Association) to include the paper in the thesis. The full reference is as follows:

Kehayes, I. L., Mackinnon, S. P., Sherry, S. B., Leonard, K. E., & Stewart, S. H. (2019). Drinking motives and drinking behaviors in romantic couples: A longitudinal actor-partner interdependence model. *Psychology of Addictive Behaviors*, *33*, 208–220.

Abstract

Excessive alcohol consumption is related to adverse physical and social consequences. Research shows an individual's own drinking motives (reasons for drinking alcohol) are linked to his/her specific drinking outcomes in a theoretically-expected manner. Romantic couples often engage in a "drinking partnership," where partners reciprocally influence each other's drinking. Though alcohol consumption partner effects have been studied, partner effects of drinking motives on an individual's alcohol consumption have not been investigated in romantic couples. We investigated this topic. Romantic couples (N = 203) were assessed once weekly for four weeks using self-report questionnaires. Participants were on average 22.7 years old (SD = 5.5) and were in their relationship an average of 2.3 years (SD = 2.4). Actor-partner interdependence models (APIMs) using multilevel path-analysis with indistinguishable dyads were conducted, with each motive predicting drinking quantity and frequency. There were significant actor effects for social and enhancement motives; moreover, changes in a partner's enhancement and social motives predicted change in the individual's drinking quantity during any given week, but only averaged partners' enhancement motives predicted the individual's drinking frequency. Coping-anxiety motives had significant actor effects when predicting averaged quantity and frequency; moreover, changes in partners' coping-anxiety motives predicted changes in drinking quantity. Enhancement and social motives of the partner influenced the drinking quantity and frequency of the actor by way of influencing the actor's enhancement and social motives. Intervention efforts targeting both members of a romantic dyad on their reasons for drinking should be tested for preventing escalations in either member's drinking behaviour.

Keywords: alcohol use; romantic couples; drinking motives; social learning theory; longitudinal

Introduction

Risky alcohol use is common among emerging adults, with 35% of Canadian university students reporting that they binge drink (i.e., consume five or more alcoholic drinks in a two-hour period; ACHA, 2016). Emerging adults also report high levels of alcohol-related problems, such as memory loss (25.4%) and drinking and driving (3.8%; Adlaf et al., 2005). Both individual and social factors, such as drinking motivations (Cooper, 1994) and partner influences in romantic relationships (Roberts & Leonard, 1998), contribute to heavy drinking. Drinking motives theory suggests individuals drink to achieve desired outcomes, and that each motive predicts a different pattern of alcohol use and alcohol-related problems (Cooper, 1994). Though much research has linked individuals' drinking motives to their own alcohol use (Cooper et al., 2016), few studies have examined drinking motives and alcohol use within a social context (c.f., Homish & Leonard, 2007). In the present study, we examined the impact of romantic partners' drinking motives on an individual's alcohol use. Specifically, do romantic partners influence each others' drinking behaviours via their drinking motivations?

Partner Influence in Romantic Couples

Individuals are constantly observing the behaviours of others around them, and often witness behaviours in others that are rewarded or punished (Bandura, 1971). Consequently, people do not need to directly experience the consequences of a behaviour to learn that it is reinforcing, we simply need to witness it being reinforced in others. In this way, observational learning can extinguish potentially punishing behaviour, and promote internalization of potentially rewarding behaviour (Bandura, 1977). Social learning theory suggests that behaviour is regulated not only by personally-experienced consequences but also through vicarious reinforcement; when we observe the motivations and behaviours of

others being reinforced, we adopt those same motivations and behaviours into our own repertoire (Akers, 1985; Bandura, 1977). While we do not directly observe the motivations of others, we observe the antecedents and consequences of certain behaviours and infer the individual's motivation through these observable events. Such socialization processes operate within many different dyadic relationships, including romantic partnerships.

Socialization of a variety of behaviours occurs within romantic relationships (Bove et al., 2003; Gonzaga et al., 2007). For example, couples influence each others' emotional responses over time (Anderson et al., 2003). Further, some research shows couples become similar in their personality traits (Gonzaga et al., 2007) and food preferences (Bove et al., 2003) over time. There is also strong correspondence between romantic partners' health behaviours, including physical activity, smoking, and drinking (Wilson, 2002). Moreover, changes in one partner's health behaviour (such as diet or smoking) appear to influence the other partner's health behaviour (Lewis et al., 2006; Sexton et al., 1987). From this body of research, it appears that couples influence each others' behaviour in a variety of ways, and the more time members of a couple spend with each other, the more likely they are to adopt their partner's reinforced behaviours (Gonzaga et al., 2007).

Social conformity pressures are also robust predictors of behaviour in emerging adults. Social impact theory suggests the more important an individual is to us, the more likely we will conform to their normative social influence (i.e., conforming to be liked and accepted by the other person; Latané, 1981). The importance of interpersonal relationships, especially romantic relationships, during emerging adulthood has been noted in many developmental studies (e.g., Steinberg & Monahan, 2007). Further, compatibility theorists argue that dissimilar partners are at risk for marital/relationship problems (Kurdek, 1991). In fact, considerable evidence suggests similarity is associated with relationship satisfaction.

For example, Gaunt (2006) found greater similarity in personality and value domains among couples was associated with greater marital satisfaction and lower negative affect. Further, Weisfeld et al. (1992) found that couples who were more similar across a variety of domains (e.g., education, health, attractiveness) reported significantly higher levels of marital satisfaction. Thus, partners may change their behaviour to maintain and improve their relationship with their partner.

Drinking Motives Theory

Motivational models of drinking (e.g., Cox & Klinger, 1988) posit individuals drink to achieve desired outcomes, and these valued outcomes motivate them to drink. These motivations can be described in terms of their valence (i.e., positively versus negatively reinforcing), and their source (i.e., internal versus external rewards). Crossing these two dimensions (valence and source) led to Cooper's (1994) four-factor model of drinking motives which includes: social (positive and external; drinking to increase social affiliation), conformity (negative and external; drinking to reduce/avoid social rejection), enhancement (positive and internal; drinking to increase pleasurable emotions), and coping (negative and internal; drinking to reduce/avoid negative affect; see also Cooper et al., 2016). Cooper's (1994) four-factor model of drinking motives was later modified to split the generic coping motive into distinct coping-depression and coping-anxiety factors (Grant et al., 2007). Research has shown these two coping motives are factorially distinct and have distinct drinking outcome correlates (Grant et al., 2007; Grant et al., 2009).

Some drinking motives are riskier than others in terms of their associations with alcohol outcomes. For example, enhancement motives are the most stable predictors of heavy alcohol consumption (Cooper, 1994; Cooper et al., 2016). Further, coping-depression and coping-anxiety motives are significant predictors of alcohol-related problems, but only

coping-with anxiety motives directly predict alcohol-related problems after accounting for alcohol consumption levels (Grant et al., 2007). In contrast, when controlling other motives, social motives are modestly associated with drinking quantity and frequency but are unrelated to binge drinking and alcohol-related problems (Kuntsche et al., 2005). Conformity motives are often negatively associated with drinking quantity and frequency yet positively related to alcohol-related problems (Cooper et al., 2016).

People are likely influenced by their romantic partners' drinking motives through a socialization process. Specifically, individuals may witness their partner being reinforced by drinking for a certain motivation, leading them to drink themselves to achieve that same rewarding outcome. For example, influence may result from partners teaching each other to drink to manage negative emotions (promoting coping motives), to affiliate with others (promoting social motives), or to enjoy the euphoric effects of alcohol (promoting enhancement motives). While it is likely that one's drinking motives can influence another's drinking motives and behaviour through social learning, social influences on drinking motives are rarely studied. Given that drinking motives are hypothesized to be a proximal influence on drinking behaviour, and the avenue through which other more distal factors (such as personality or social influences) predict alcohol consumption (Cooper, 1994; Kuntsche et al., 2008), it is important to test whether one person's motives can influence another's risky drinking behaviours.

Partner Influence and Alcohol Consumption

Social conformity pressures are robust predictors of alcohol use and misuse (Fairlie et al., 2012). For instance, interpersonal influence from peers is a strong predictor of alcohol consumption in university students (Wood et al., 2001). The partner influence hypothesis suggests partners in romantic relationships influence one another's alcohol consumption

(Mushquash et al., 2013). Thus, a "drinking partnership," develops where partners influence each other's drinking in a reciprocal manner (Roberts & Leonard, 1998). Supporting this notion, Leonard and Eiden (1999) found husbands' drinking influenced their wives' drinking over the first year of marriage. Husbands and wives also reciprocally influenced each other's drinking over a five-year period (Windle & Windle, 2014). Mushquash et al. (2013) found partner heavy episodic drinking significantly predicted future individual heavy episodic drinking over a 30-day period in dating couples. This finding has since been replicated over a 3-year period, with dating couples positively influencing each others' drinking over time (Bartel et al., 2017). Congruence of drinking patterns between partners is associated with higher relationship satisfaction (Homish & Leonard, 2007). Thus, drinking partnerships may sometimes be beneficial to relationship functioning (e.g., Linden-Carmichael et al., 2016).

While romantic partners seem to influence each others' drinking behaviours, it is unknown if a partner's drinking motives influence an individual's drinking behaviours. One study that examined drinking motives within mixed-sex couples showed that coping-depression motives mediate the relationship between dyadic conflict and alcohol-related problems, but only for women (Lambe et al., 2015). Kuntsche and Stewart (2009) found that individual drinking motives (enhancement, conformity, coping, and social) were positively predicted by classmate motives in a sample of 12- to 18-year-olds students, demonstrating drinking motives can be transmitted via peer social influence. Further work suggests that drinking motives of one's own peer-group can influence an adolescent's own drinking levels by way of impacting the adolescent's own drinking motives (Stewart et al., 2014). Kuntsche and Stewart (2009) similarly demonstrated that the drinking motives of classroom peers could influence the drinking behaviour of an individual adolescent via influence on the individual adolescent's own drinking motives. Furthermore, a study by Hussong (2003) used

a 28-day daily diary methodology in college student friendship dyads to show college students' own alcohol use levels were influenced by their own drinking motives and by the drinking motives of their best friends. While the evidence is limited, it appears a valued other person's drinking motives can influence an individual to drink through a socialization process. However, no one has yet investigated this process in romantic couples.

Rationale and Hypotheses

We investigated if romantic couples could influence each other's drinking behaviours via their drinking motivations. Given how influential romantic relationships are in young adulthood (Steinberg & Monahan, 2007), it is important to test if the motivations of one partner can cause changes in the drinking behaviour of another partner. There has been no study to our knowledge that has investigated this important process. Investigating drinking motives within a social context also represents a significant advance to drinking motives theory; prior tests have tended to focus exclusively on the individual, ignoring the role of close relationships. If romantic couples can influence each others' drinking behaviour via influencing drinking motivations, drinking motives in couples could be an important target for intervention to prevent escalations in drinking over time in either member of the couple. Moreover, if a romantic partner influences an individual's drinking behaviours via partner drinking motives, we wanted to investigate whether said influence occurs indirectly via changes in the individual's drinking motives given similar findings in adolescent peer groups (Kuntsche & Stewart, 2009). Such a result would provide a mechanism through which partners effect change in individual drinking behaviours.

We utilized a four-wave, four-week longitudinal design and the actor-partner interdependence model (APIM; Cook & Kenny, 2005). Our study involved weekly measurement intervals to minimize recall bias and maximize reliability through repeatedly

assessing events. Data collected over shorter intervals may also better capture short-term transactions between participants and their social environments. The APIM accounts for interdependence in dyadic relationships and assesses both actor effects and partner effects. Actor effects refer to the influence one's own characteristics have on one's own behaviour; partner effects refer to the influence the partner's characteristics have on the behaviour of the other individual in the relationship. By controlling for individual stability, a longitudinal APIM provides a stringent test of whether partners influence each other over time. The drinking behaviours of interest in the present study were the total number of drinks consumed per week divided by the number of drinking occasions (quantity) and number of days spent drinking per week (frequency). Given that enhancement and social motives are the strongest predictors of drinking behaviour in non-clinical samples (Cooper et al., 2016), we hypothesized these two motives would predict drinking behaviour in romantic partners. The specific hypotheses for our study were as follows:

H1: An individual's enhancement and social drinking motivations would positively predict their own alcohol consumption quantity and frequency (i.e., actor effects).

H2: A partner's enhancement and social drinking motivations would positively predict the alcohol consumption quantity and frequency of the individual (i.e., partner effects).

H3: Partner enhancement and social drinking motivations would have an indirect effect on the individual's alcohol consumption quantity and frequency by way of influencing the individual's own enhancement and social drinking motivations, respectively.

H4: The predictions proposed in H1, H2 and H3 would hold at the within-subjects level (i.e., change within any given week) and the between-subjects level (averaged across all our weeks).

Cooper et al.'s (2015) meta-analysis also suggests coping and conformity motives positively

predict alcohol quantity and frequency. However, the effect sizes tend to be small relative to enhancement and social motives. Thus, our predictions for these motives were more tentative, and are framed as a general exploratory research question:

RQ1: Do coping-anxiety, coping-depression, and/or conformity motives have positive actor and/or partner effects when predicting alcohol consumption quantity and frequency?

Method

Participants

Our study received research ethics board approval. Romantic couples were recruited in two separate samples (N_1 = 101; N_2 = 102 couples) from the community and via the psychology research pool.[2] Data were combined from both samples for analyses. The combined sample consisted of 203 couples (187 [92%] mixed-sex, 14 [7%] same-sex female and 2 [1%] same-sex male). Participants' mean age at baseline was 22.6 (*SD* = 5.5) years, and most were students (59.2%) and Caucasian (83.5%). Further, 51.7% were cohabitating and 8.4% were married. Couples were in their relationship for an average of 2.3 years (*SD* = 2.4; range = 3 weeks to 15.7 years) and couple members had frequent face-to-face contact with their partner (*M* = 6.2, *SD* = 1.4 days per week).

Measures

Modified Drinking Motives Questionnaire- Revised (Modified DMQ-R; see Appendix B)

Drinking motives were measured using the Modified DMQ-R, 7-day version (Lambe et al., 2015), a 28-item, self-report measure that assesses participants' scores on five subscales, each related to a specific drinking motive: coping-anxiety ("*To reduce my anxiety"*), coping-depression ("*To numb my pain"*), enhancement ("*To get a high"*), conformity ("*To be liked"*), and social ("*To be sociable"*). Participants rated how much the

[2]See Footnote 1 for list of published manuscripts utilizing the romantic couples dataset.

specific item related to their reasons for drinking over the past 7 days on a relative frequency scale ranging from 1 (*almost never/never*) to 5 (*almost always/always*). The Modified DMQ-R, 7-day version, has shown adequate to excellent internal consistency across subscales (α = .72 to .91; Lambe et al., 2015) and correlates strongly with the original Modified DMQ-R (*r*s from .69 to .77; Lambe et al., 2015).

Self-Administered Timeline Follow-Back (STLFB; see Appendix C)

Drinking quantity and frequency were measured using the STLFB (Collins et al., 2008), a self-report measure, in calendar form, used to track alcohol intake over the past 7 days. Participants were asked to indicate on a calendar the days they drank and how many standard alcoholic beverages they had that day. Self-report accuracy is typically improved by utilizing a calendar as a memory anchor (Collins et al., 2008). STLFB data was used to calculate quantity of drinks consumed (i.e., the sum of drinks consumed per week divided by the number of drinking days) and frequency of drinking days (i.e., the number of drinking days per week). A single drink was defined as 5-ounces of wine, 12-ounces of beer or cooler, or a drink containing one shot of liquor or spirits for the STLFB. Visual aids representing standard drinks were also provided as well as descriptions of the number of standard drinks found within various bottles of alcohol (Kerr & Stockwell, 2012). The STLFB converges with other measures of alcohol use (Collins et al., 2008).

Procedure

Sample 1 was recruited from the community via posters, online ads, and the psychology research participant pool. Couples were only recruited if they were (a) in a current romantic relationship and (b) each partner drank at least 12 alcoholic drinks in the past year. These criteria were used to ensure all couples were engaging in drinking behaviour and were actively in a relationship. Couples completed baseline pen-and-paper

questionnaires in the lab on the same day and were required to attend together. All alcohol questionnaires asked about the past seven days. Participants were scheduled to return to the lab to complete the same questionnaires once a week for an additional three weeks. Each appointment was scheduled seven days apart. If couples missed their appointment, researchers attempted to schedule a make-up survey as close as possible to the original appointment date. Participants were given six days to complete a make-up survey at any given wave. Thus, all surveys were completed at minimum 7 days apart and at maximum 13 days apart. Follow-up appointments were then rescheduled to seven days after the make-up survey was completed. Each participant was compensated either $5.00 or one credit point in an eligible psychology class for each wave completed and was debriefed following the final session.

Sample 2 was recruited in a similar manner as Sample 1. Couples were recruited with the same inclusion criteria as Sample 1, with the addition that each couple had to have Internet access at home. Questionnaires were completed online using Opinio 7.1.2 (ObjectPlanet Inc., 1998) software and couples only came into the lab to complete the baseline questionnaire. All further follow-ups were completed at home using participants' personal computers. Participants were sent a secure link to their survey in an email that contained their individual identification code. The link to the survey only remained open for a 24-hour period. If the participant missed the survey, a make-up survey was sent via a link that also expired 24-hours later. These make-up surveys were sent out every day for up to six days after the original survey was sent. After six days passed, that wave was considered missed. If a participant filled-out a make-up survey, the instructions were modified so that the measures referred to the originally scheduled 7-day reporting period to ensure both couple members were always reporting on the same 7-day period. To encourage retention,

participants in Sample 2 were also provided with an extra $5.00 each if both members of the couple completed their surveys on the same scheduled day. All participants in Sample 2 were debriefed via email and compensated with money or a gift certificate.

Data Analytic Strategy

Compliance rates were assessed by analyzing the proportion of make-up surveys completed and by examining proportions of missing data. Intraclass correlations (ICCs) were also computed for each variable to determine whether multilevel modeling was warranted. ICCs indicate the percentage of variance available to be explained at the between-subjects level. ICCs larger than .05 are considered suitable for multilevel analysis (Preacher et al., 2010). Descriptive statistics and multilevel bivariate correlations were also calculated, including means, standard deviations, and internal consistencies. Within- and between-subjects internal consistencies were calculated using Cronbach's alpha (Geldhof et al., 2014)

Hypotheses were tested using APIMs (Kenny & Ledermann, 2010) in a multilevel path-analysis framework. APIMs are a dyadic data analytic approach used to test interdependence within interpersonal relationships. APIMs are comprised of both actor and partner effects. Actor effects measure how well one's own drinking motives predict one's own alcohol outcomes, whereas partner effects measure the extent to which a partner's drinking motives predict the actor's alcohol outcomes. Ten APIMs were modeled to test the effects of all five drinking motives on both alcohol outcomes (quantity, frequency). To account for the longitudinal aspect of the data, multilevel path-analysis with fixed slopes was used (Preacher et al., 2010). This method partitions variance into between-subjects and within-subjects components. In the current study, the between-subjects level represents the portion of variance that did not change across four weeks (e.g., when averaged across four weeks, were drinking motives and alcohol outcomes related?). The within-subjects level

represents change within any given week (e.g., did drinking motives and alcohol outcomes change in the same direction within any given week?). Models appear in Figure 4.1. A standardized root-mean-square residual (SRMR) < .08, a root-mean-square error of approximation (RMSEA) < .06, and a CFI and TLI > .95 indicate excellent model fit (Kline, 2011). To account for violations of the normality assumption, a robust estimator of fit indices and standard errors was used (MLR estimation). Missing data were handled using a full information maximum likelihood approach (Enders & Bandalos, 2001), which uses all available data to adjust parameters and standard errors to account for missing data. The 95% confidence intervals for indirect effects were assessed using the delta method in Mplus using the MODEL CONSTRAINT command (Muthén & Muthén, 2017).

Results

Missing Data and Compliance

Compliance rates were high across both samples; couples completed, on average, 3.70 (*SD* = 0.76) of a possible four waves, with 81.8% of participants completing all four waves. Six couples at Wave 2, 12 couples at Wave 3, and 12 couples at Wave 4 had data from only one member of the couple, respectively. At wave 2, 76.6% completed their survey on the scheduled date, 12.6% completed a make-up survey, and 10.8% failed to complete their survey. At wave 3, 66.7% completed their survey on the scheduled date, 16.1% completed a make-up survey, and 17.2% failed to complete their survey. At wave 4, 69.0% completed their survey on the scheduled date, 13.0% completed a make-up survey, and 18.0% failed to complete their survey. There were 7.45 days (*SD* = 1.00) on average between completed surveys. Missing data varied by wave. Skip logic was used such that participants did not complete the DMQ-R if they consumed zero drinks on a given week. Thus, drinking motives were always missing when participants abstained from alcohol on a given week.

Because of this, data analysis incorporated only data from weeks where alcohol was consumed by at least one partner.[3] At wave 1, 17.5% of participants did not drink alcohol the previous week and thus did not have drinking motives to report. All participants completed wave 1 so there were no other missing data. At wave 2, 20.3% of participants did not drink alcohol the previous week and thus had no motives to report. Another 8.3% of data was lost due to noncompliance. At wave 3, 23.6% of participants did not drink alcohol the previous week and thus had no motives to report. Another 6.6% of data was lost due to noncompliance. At wave 4, 25.5% of participants did not drink alcohol the previous week and thus had no motives to report. Another 7.1% of data was lost due to noncompliance. Out of a potential 1,624 weeks of data (406 participants X 4 weeks), 1,183 weeks had available data (i.e., participants responded to the survey and drank during the past week). A significant Little's MCAR test, $\chi^2(402) = 523.46$ $p < .001$, revealed the data were not missing completely at random. Closer examination of separate variance *t*-tests revealed that missing data could be significantly predicted by age on all variables (i.e., older participants had more missing data). As a result, age was added as a covariate in all analyses. Thus, data were assumed to be missing at random (i.e., missing data could be predicted by variables within our models). Results did not change when controlling for lab versus online sample.

Descriptives, Intraclass Correlations, and Bivariate Correlations

Means and standard deviations on all study measures were calculated from the combined sample and appear in Table 4.1. Drinking quantity ranged from 1 to 25 drinks and

[3]Drinking outcomes for abstainers on any given week were coded as missing data, rather than zeros. Thus, when only one partner drank in a given week, their data was used to calculate actor effects (but not partner effects). When both partners drank in a given week, their data was used to calculate both actor and partner effects. When neither partner drank in a given week, they were excluded from the model. This maximized the use of all available data.

drinking frequency ranged from 1 to 7 drinking occasions per week. Within-subjects and between-subjects bivariate correlations[4] appear in Table 4.2. Overall, most variables were correlated as expected. All five drinking motives were correlated with each other at the within- and between-subjects levels. Drinking quantity was correlated with coping-anxiety motives at the between-subjects level and with enhancement and social motives at both levels. Drinking frequency was correlated with enhancement, coping-anxiety, and coping-depression motives at the between-subjects level and with social motives at the within-subjects level. Relationships tended to be larger at the between-subjects level. Internal consistencies at the between-subjects and within-subjects levels revealed alphas that ranged from .96 to 1.00 (between) and from .90 to .99 (within) suggesting excellent reliability. ICCs suggested that around 21% (drinking quantity) to 67% (enhancement motives) of the variance was at the between-subjects level, supporting our decision to utilize multilevel modeling.

Multilevel Path-Analysis

Ten separate models were specified, with each of the five drinking motives individually predicting our two outcomes (i.e., drinking quantity and frequency). These models are shown in Figure 4.1 and were analyzed using indistinguishable dyads which included both same-sex and mixed-sex couples in the same analysis (see Appendix D Table

[4]In Appendix D (Table D.2.), we examined supplementary bivariate correlations between residualized drinking motive scores and our outcome variables contrasted with our initial analysis. Residualizing the drinking motives created scores where the unique shared variance between all four motives was removed. We also created residualized variables excluding social motives as a predictor of enhancement motives and vice versa (e.g., residuals of a regression analysis with coping-anxiety, coping-depression, and conformity motives predicting social motives). The purpose of this analysis was to demonstrate that controlling for all other motives in this model is liable to create misleading results because the predictor variables themselves overlap considerably. Thus, we decided to use each drinking motive as an individual predictor without removing the shared variance of all other motives.

D.3 for supplementary distinguishable dyad model results with same-sex couples removed). All fit indices, with the exception of the chi-squared (χ^2) goodness of fit test, suggested the models fit the data well (see Table 4.4 for fit statistics). Unstandardized path coefficients and covariances for all models can be found in Table 4.3. Only statistically significant findings for actor and partner effects at $p < .05$ are noted below.

Higher enhancement motives were associated with significantly greater drinking frequency among actors at the within- and between-subjects levels (i.e., an increase in 1.0 on the enhancement motives scale predicted a 0.12 unit increase in drinking frequency among actors at the within-subjects level and a 0.30 unit increase in actors at the between-subjects level), but were only positively associated with partner drinking frequency at the between-subjects level (i.e., an increase in 1.0 on the enhancement motives scale predicted a 0.14 unit increase in drinking frequency among partners at the between-subjects level). Higher enhancement motives were also associated with significantly greater drinking quantity among both actors and partners at the within- and between-subjects levels. Overall, effects for drinking quantity were stronger than effects for drinking frequency at both within- and between-subjects levels.

Higher social motives were associated with significantly greater drinking frequency in the actor at the within-subjects level. Consistent with hypotheses, higher social motives were also associated with significantly greater drinking quantity among both actors and partners at the within- and between-subjects levels. Higher coping-anxiety motives were associated with significantly greater drinking frequency in the actor at the between-subjects level only. Higher coping-anxiety motives were also associated with significantly greater drinking quantity among both actors and partners at the between-subjects level. Higher coping-depression motives were only associated with greater drinking frequency in the actor

at the between-subjects level. Finally, conformity motives were not associated with drinking in the actor or partner at either the between- or within-subjects levels.

Effect Sizes

Estimates of standardized effect sizes for outcome variables (i.e., drinking frequency and quantity) were calculated using R^2 values at the between-subjects and within-subjects levels. Because variances can differ across partners, R^2 values can vary slightly across partners despite the equality constraints placed on the model for indistinguishable dyads (Kline, 2011). As a result, a range of values is reported here for R^2 values. The within-subjects R^2 values ranged from < .01 (coping-anxiety motives predicting frequency) to .07 (social motives predicting quantity). The between-subjects R^2 values ranged from .04 (conformity motives predicting quantity) to .45 (social motives predicting quantity). However, readers should note that standardized effect sizes in multilevel models may not generalize well to other samples.

Indirect Effects

Indirect effects testing mediation are displayed in Appendix D (Table D.4). Overall, only positive reinforcement drinking motives (i.e., social and enhancement) showed evidence of mediation. Higher partner social motives positively predicted actor alcohol quantity through actor social motives at the between- and within-subjects levels. Partner social motives predicted actor drinking frequency through actor social motives at the within-subjects level only. Higher partner enhancement motives predicted increased actor drinking frequency and alcohol quantity through actor enhancement motives at the between-subjects level. At the within-subjects level, higher partner enhancement motives did not predict actor drinking frequency (p = .152) or actor alcohol quantity (p = .063). As noted in Table 4.4, partner effects for conformity, coping-depression, and coping-anxiety motives were less

consistent; indirect effects including these pathways were nonsignificant.

Discussion

The purpose of our study was to integrate drinking motives theory (Cooper, 1994) and drinking partnership theory (Roberts & Leonard, 1998) to test if individual drinking motives are associated with increased drinking behaviour in romantic partners. Previous studies had investigated drinking partnerships in terms of alcohol consumption (Bartel et al., 2017; Leonard & Eiden, 1999), but no one had investigated whether the drinking motives of one partner were associated with drinking behaviours in the other partner. We advanced this area by testing hypotheses using longitudinal data and multilevel APIMs. Multilevel models allowed us to partition the variance into between- and within-subjects components where stable, trait-like variance was represented by the between-subjects models (i.e., the proportion of the variance that remained the same over 4 weeks) and where state-like variance was represented by the within-subjects models (e.g., the portion of the variance that varied across 4 weeks). The between-subjects model is most consistent with cross-sectional research; however, it improves on cross-sectional studies by reducing measurement error by partialing out within-subjects variation. The within-subjects models represented the more substantial advancement to the literature as they allowed for tests of co-occurring change over time (Little et al., 2007). Overall, novel results from our study suggest drinking motives are not only associated with drinking behaviour in the individual but are also associated with drinking behaviour in the individual's romantic partner.

Consistent with hypotheses and prior research (e.g., Grant et al., 2007), enhancement motives in the actor predicted drinking quantity and frequency in the actor at both the within- and between-subjects level. That is, individuals who endorsed greater drinking for enhancement reasons tended to drink in higher quantities and more frequently when

averaged across the four weeks of the study. Moreover, state-like fluctuations in enhancement motives were associated with state-like fluctuations in both alcohol outcomes over the four weeks. Enhancement motives are a risky drinking motive given their link with heavy alcohol consumption and frequency of use (Cooper et al., 2016). Research also suggests drinking alcohol to achieve its mood-enhancing, positively reinforcing effects leads to escalations in drinking quantity and frequency over time (Grant et al., 2007; Mackinnon et al., 2014). Our study supplements these results in a sample of emerging adult drinkers followed weekly over four weeks.

A similar pattern emerged when examining partner effects, where the partner's enhancement motives significantly predicted the individual's drinking quantity at both the within- and between-subjects levels, as well as the individual's drinking frequency at the between-subjects level only. That is, drinking for enhancement reasons in one partner was associated with increased alcohol consumption and drinking frequency in the other partner when averaged across time, and with co-occurring changes in the other partner's alcohol quantity within a given week. Consistent with hypotheses, when averaged across time, this relationship was mediated by the actor's own enhancement motives. That is, if the partner was motivated to drink for enhancement reasons, the individual also tended to drink for enhancement reasons which in turn was associated with increased drinking frequency and quantity in the individual. These findings extend Kuntsche and Stewart's (2009) findings with adolescent peers to romantic couples and provide a mechanism through which a partner's drinking motives effect change in an individual's drinking behaviour.

Consistent with hypotheses, social motives in the actor and partner also predicted actor drinking quantity at both the within- and between-subjects level. This association was mediated by effects on the actor's own social motives at both the within- and between-

subjects level. Moreover, social motives of the partner were associated with the drinking frequency of the actor through effects on the actor's social motives at the within-subjects level only. Social motives are regarded as a less risky motive as they are typically associated with moderate alcohol use when the influences of other riskier motives are controlled for (Kuntsche et al., 2005) The current study adds support to research where social motives are related to alcohol consumption in emerging adults when other motives are not controlled for (Grant et al., 2007). Overall, partner effects appeared to be stronger for enhancement motives than for social motives. This finding is consistent with literature at the individual level where enhancement motives are more strongly related with alcohol consumption than social motives (Grant et al., 2007; Mackinnon et al., 2014). Taken together, it appears that positive reinforcement motives (i.e., enhancement and social) are the strongest predictors of drinking behaviour in one's partner.

Results for coping motives were inconsistent across our two alcohol outcomes. Both coping motives predicted actor drinking frequency at the between-subjects level only. Coping-anxiety motives also predicted actor drinking quantity at the between-subjects level, but coping-depression motives did not predict actor drinking quantity at either level of analysis. When coping-motivated drinking is measured as a single construct it is related to alcohol quantity and frequency of use, although findings are mixed (Kassel et al., 2000; Read et al., 2003). When measured more specifically, coping-depression motives are associated with drinking quantity whereas coping-anxiety motives are directly associated with alcohol-related problems (Grant et al., 2007). Our discrepant results may be attributable to our weekly assessment of motives where Grant et al. (2007) utilized a yearly measure of motives. Further, our results may be more accurate given participants responded to questions about their reasons for drinking closer in time to instances of drinking events. Our results

suggest that those who drink to cope with low mood are drinking frequently, while those who drink to cope with anxiety are drinking both frequently and in higher quantities. A single partner effect emerged where coping-anxiety motives in the partner predicted drinking quantity in the individual at the between-subjects level. Thus, drinking to cope with anxiety in one partner was related to increased drinking quantity in the other partner when averaged across time.

Our results partially replicate Hussong (2003) who found drinking motives of close friends predicted increased individual alcohol consumption over a 28-day period in college students. While Hussong (2003) demonstrated nonspecific partner effects attributable to all drinking motives, we found partner effects for enhancement, social, and coping-anxiety motives only. Hussong (2003) hypothesized her lack of specificity may suggest that any motive that increases the likelihood of drinking in the social context of a close friend results in increased alcohol consumption by an individual young adult. Our results suggest only specific motives are associated with alcohol consumption in a romantic relationship. However, all our reported effects are positive in the expected direction, similar to Hussong's (2003) findings. Thus, it is likely some drinking motives are more strongly associated with drinking behaviour within couples than others (such as enhancement and social motives) and we lacked statistical power to detect smaller effects. Hussong (2003) also utilized a daily diary approach so methodological differences as well as differences across friendships and romantic relationships may explain our somewhat discrepant results. Further, conformity motives are related to drinking within a peer context and not a romantic context (Cooper et al., 1992) which likely impacted our null conformity motive results.

It may at first seem counterintuitive that a partner's internal drinking motives (enhancement and coping-anxiety) would be associated with an individual's drinking as the

internal motives of one's partner would presumably be unobservable to the individual. However, both enhancement and coping motives have been shown to be transferred between peers in adolescence (Stewart et al., 2014), suggesting internal motives are likely perceivable by others (e.g., seeing a partner drink to cope with observable anxiety). It is possible that given the observability of drinking for enhancement, coping-anxiety, and social reasons, individuals were more likely to be affected by those motives in their partner. As mentioned, conformity motives lie on the external dimension of Cooper's (1994) model and are more closely related to peer drinking than to romantic partner drinking. Thus, conformity motives may not have been influential in a romantic context (Cooper et al., 2016). Given the general dearth of research on drinking motives within romantic relationships, studies should clarify whether conformity motives operate in a similar fashion within romantic relationships as they do with individuals. To do so, conformity items on the Modified DMQ-R (e.g., "To fit in with a group you like") could be modified to increase their applicability to drinking in a romantic relationship context.

Our study is the first to show partner effects on drinking via drinking motives in romantic partners. Moreover, we are the first to show in romantic couples that positive reinforcement motives in the partner are associated with increased positive reinforcement motives in the actor, which in turn are associated with increased drinking behaviours in the actor. These results provide a significant contribution to the drinking motives literature by focusing on the social contributions (i.e., romantic partner effects) of motives as opposed to their contributions at the level of the individual (e.g., drinking motives mediational relationship between personality and substance use; Mackinnon et al., 2014). From this, it appears people's drinking is affected not only by the explicit drinking behaviours of their romantic partners (Bartel et al., 2017; Homish & Leonard, 2007; Mushquash et al., 2013),

but also by their partners' reasons for drinking. And by witnessing their partner's reasons for drinking, individuals may come to drink themselves for those same reasons and may escalate their drinking as a result (Kuntsche & Stewart, 2009). However, given the direct partner effects of motives on drinking remained significant after controlling for actor effects, there are likely other important mediational factors (such as drinking together; Levitt & Leonard, 2013) that may also help explain the association between a partner's drinking motives and an individual's drinking behaviours.

Studies support the importance of romantic partners in emerging adult drinking (Steinberg & Monahan, 2007). Among other things, romantic partners are similar in their drinking behaviours (Ask et al., 2012). Our results suggest part of the similarity found in drinking behaviours in couples may be due to the motivations behind drinking behaviours. Partners may teach each other (via social learning; Bandura, 1971) to drink to increase positive affect and social affiliation. In this way, partners may teach each other not only *how* to drink, but *why* to drink, resulting in escalations of each others' drinking behaviour.

Intervention efforts may wish to explore motivations for drinking in romantic partners of people with problematic drinking habits given that social influence could result in escalations in risky drinking behaviours in both members of a couple. Individually-tailored interventions targeted to underlying motivational processes have been shown to reduce risky drinking behaviour, risky internal drinking motives, and alcohol-related problems when administered to individuals (Conrod et al., 2011). This type of intervention might be usefully adapted for helping couples to understand and address factors which may serve to reinforce and maintain their risky drinking patterns. Further, our results suggest the focus in treatment should be on reducing positive reinforcement motives as these motives appear to have the largest effect sizes when predicting drinking quantity over time in partners. This finding is

consistent with other studies that have specifically linked positive reinforcement motives to risky drinking (e.g., White et al., 2016). Couples may benefit from developing alternative activities that they could do together instead of drinking, particularly if those activities have the added benefit of addressing their underlying positive reinforcement motives. For example, taking up a stimulating hobby together, such as running or biking, may address a couple's shared need for enhancement, or attending a community event or volunteering may address their shared need for social engagement. Moreover, educating individuals on the impact their partner may be having on their reasons for drinking may also be an important step in preventing escalations in drinking over time. Positive reinforcement motives were found to most consistently predict increased alcohol consumption in couples, but this may be different for partners who engage in more hazardous drinking, or for those who become dependent on alcohol. Withdrawal from alcohol causes negative symptoms such as irritability, increased anxiety and depression, as well as loss of motivation and dysphoria (Koob & Volkow, 2016). There may therefore be a shift from seeking positive reinforcement from alcohol to seeking negative reinforcement to reduce negative emotional states triggered by withdrawal.

Limitations and Future Directions

It is important to recognize the limitations of this study. First, we were unable to tease apart socialization versus selection effects on drinking behaviour. While we did find longitudinal changes in drinking behaviour via drinking motives, couples may also have selected one another based on similarity in drinking behaviour and/or drinking motives when their relationship began. Future research could recruit couples who have just begun their relationship to see whether couples initially select partners due to their reasons for drinking, and/or whether drinking motive influence occurs as their relationships progresses. Second,

we may have lacked statistical power to detect small effects due to our sample size; this is particularly true when coping and conformity motives are predictors, as a meta-analysis suggests these are weaker predictors of alcohol use than enhancement and social motives (Cooper et al., 2016). Third, significant chi-squared tests suggested poor model fit, although this test is often significant with larger samples (Kenny & McCoach, 2003). Finally, replicability of our results may be related to excluding non-drinking weeks from our models. Non-drinking weeks were excluded from our models because we could not measure an individual's drinking motives in the absence of drinking behaviour. In order to obtain relevant data regardless of drinking behaviour, future dyadic research could measure different types of urges to drink (e.g., reward versus relief urges; Glöckner-Rist et al., 2013) or include motives for abstaining (Anderson et al., 2011) which could be used to examine actor and partner effects on alcohol abstention and motives for abstaining.

Models presented were also analyzed using indistinguishable dyads to increase generalizability to same-sex couples. While we included a distinguishable dyads analysis in our supplemental materials, this required us to exclude 8% of our sample who identified as being in a same-sex relationship. Moreover, the distinguishable dyad approach doubled the number of *p*-values calculated causing our Type I error rate to increase. Our distinguishable dyad analyses resulted in multiple significant actor effects of motives predicting drinking frequency for female partners only, whereas motive actor and partner effects were similar across both sexes when predicting drinking quantity. Research could build upon our work by testing a similar model using a larger sample with distinguishable mixed-sex dyads to investigate sex differences more thoroughly. Additionally, given our sample contained only 8% same-sex couples, future studies should oversample same-sex couples to better understand partner influences in same-sex couples.

We also combined data from two samples that used two slightly different methods. While these methodological differences may have some impact on results, conclusions did not change when controlling for sample. Shorter or longer time lags may produce different results. For example, a longer time frame might allow researchers to examine if the association between drinking motives and drinking behaviours within partners changes over long-term relationships, either in magnitude of effect and/or in the specific motive(s) that is/are associated with drinking behaviour within the couple. Finally, our sample mainly consisted of young, dating, student couples so the results may not generalize to other dyads (e.g., older married couples or peer dyads).

Conclusions

Our study integrated drinking motives theory (Cooper, 1994) and drinking partnership theory (Roberts & Leonard, 1998) in romantic relationships to test if the drinking motives of one partner were associated with the drinking behaviours of the other partner. Results showed partner positive reinforcement motives (enhancement and social motives) were most predictive of drinking behaviour in the actor and this was mediated through partner effects on the actor's positive reinforcement motives. Moreover, partner positive reinforcement motives were associated with actor drinking behaviour in both a trait-like and state-like way over time. Results suggest positive reinforcement motives may be important targets in couples' therapy to prevent escalations in either member's drinking over time. Our results also show the relationship between drinking motives and drinking behaviour goes beyond the individual and extends to intimate relationships as well.

Table 4.1. Descriptive Statistics

	Wave 1 (N = 335)		Wave 2 (N = 291)		Wave 3 (N = 283)		Wave 4 (N = 274)	
	M	SD	M	SD	M	SD	M	SD
Coping with depression motives	1.34	0.64	1.25	0.57	1.22	0.51	1.20	0.54
Coping with anxiety motives	1.82	0.82	1.70	0.72	1.63	0.69	1.67	0.69
Enhancement motives	2.35	1.05	2.24	1.03	2.12	0.99	2.08	1.02
Conformity motives	1.16	0.40	1.14	0.44	1.14	0.41	1.11	0.31
Social motives	2.54	1.00	2.38	1.01	2.30	1.02	2.16	1.03
Drinking quantity	4.04	2.82	4.35	3.14	4.02	2.98	4.07	3.00
Drinking frequency	2.57	1.40	2.51	1.60	2.57	1.53	2.43	1.57

Note. N = number of participants; *M* = mean; *SD* = standard deviation; Drinking quantity = total number of drinks consumed per week divided by the number of drinking days; Drinking frequency = drinking occasions per week.

Table 4.2. Bivariate Correlations, Intraclass Correlations, and Reliability at Between- and Within-Subjects Levels

Variable	1	2	3	4	5	6	7
1. Coping with depression motives	--	.38***	.29***	.27***	.11*	-.03	.06
2. Coping with anxiety motives	.67***	--	.41***	.19**	.23***	.00	.05
3. Enhancement motives	.38***	.63***	--	.17**	.39***	.12***	.06
4. Conformity motives	.36**	.39***	.25***	--	.20***	.02	.04
5. Social motives	.32***	.57***	.69***	.43***	--	.14*	.10**
6. Drinking quantity	.16	.23**	.45***	.11	.49***	--	-.08***
7. Drinking frequency	.21*	.24**	.27***	-.03	.12	.07	--
ICC	.60	.62	.67	.50	.50	.21	.47
Alpha reliability (within-subjects)	.987	.899	.921	.987	.895	--	--
Alpha reliability (between-subjects)	.997	.959	.957	.996	.957	--	--

Note. Between-subjects correlations are below the diagonal, and within-subjects correlations are above the diagonal. ICC = intraclass correlation. Drinking quantity = total number of drinks consumed per week divided by the number of drinking days; Drinking frequency = drinking occasions per week.

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

Table 4.3. Multilevel Actor-Partner Interdependence Model Coefficients

	Outcome: Frequency							
	Actor Effects		Partner Effects		Covariance: Predictor		Covariance: Outcome	
	B (*SE*)	*p*	*B* (*SE*)	*p*	*B* (*SE*)	*P*	*B* (*SE*)	*p*
Within Subjects								
CAM	0.09 (0.08)	.233	0.06 (0.09)	.491	0.03 (0.02)	.064	**0.56 (0.09)**	**< .001**
CDM	0.16 (0.09)	.065	0.09 (0.11)	.387	0.02 (0.01)	.054	**0.56 (0.09)**	**< .001**
Enhancement	**0.12 (0.06)**	**.048**	0.02 (0.06)	.805	**0.05 (0.02)**	**.031**	**0.56 (0.09)**	**< .001**
Social	**0.14 (0.05)**	**.003**	0.00 (0.05)	.958	**0.10 (0.03)**	**.001**	**0.56 (0.09)**	**< .001**
Conformity	0.13 (0.14)	.334	0.27 (0.15)	.071	0.01 (0.01)	.253	**0.55 (0.09)**	**< .001**
Between Subjects								
CAM	**0.31 (0.12)**	**.009**	0.07 (0.11)	.524	0.08 (0.04)	.079	**0.57 (0.11)**	**< .001**
CDM	**0.46 (0.17)**	**.007**	0.07 (0.16)	.665	0.04 (0.03)	.091	**0.57 (0.10)**	**< .001**
Enhancement	**0.30 (0.07)**	**< .001**	**0.14 (0.07)**	**.041**	**0.24 (0.07)**	**.001**	**0.51 (0.10)**	**< .001**
Social	0.20 (0.10)	.054	0.09 (0.10)	.373	**0.30 (0.06)**	**< .001**	**0.57 (0.11)**	**< .001**
Conformity	0.09 (0.23)	.714	0.06 (0.22)	.771	0.03 (0.02)	.076	**0.59 (0.12)**	**< .001**
	Outcome: Quantity							
	Actor Effects		Partner Effects		Covariance: Predictor		Covariance: Outcome	
	B (*SE*)	*p*	*B* (*SE*)	*p*	*B* (*SE*)	*P*	*B* (*SE*)	*p*
Within Subjects								
CAM	-0.03 (0.21)	.895	0.03 (0.18)	.873	0.03 (0.02)	.063	**1.33 (0.61)**	**.030**
CDM	-0.13 (0.31)	.663	0.22 (0.29)	.456	0.02 (0.01)	.053	**1.35 (0.58)**	**.019**
Enhancement	**0.70 (0.15)**	**< .001**	**0.60 (0.16)**	**< .001**	**0.05 (0.02)**	**.031**	**1.12 (0.54)**	**.037**
Social	**0.72 (0.14)**	**< .001**	**0.29 (0.11)**	**.007**	**0.10 (0.03)**	**.001**	**1.26 (0.44)**	**.004**
Conformity	0.48 (0.33)	.143	0.42 (0.24)	.083	0.01 (0.01)	.267	**1.30 (0.61)**	**.034**
Between Subjects								
CAM	**0.66 (0.24)**	**.006**	**0.64 (0.30)**	**.036**	0.08 (0.04)	.077	**2.62 (0.54)**	**< .001**
CDM	0.65 (0.47)	.174	0.62 (0.33)	.057	0.04 (0.03)	.107	**2.83 (0.51)**	**< .001**
Enhancement	**0.83 (0.16)**	**< .001**	**0.63 (0.21)**	**.002**	**0.24 (0.07)**	**.001**	**2.00 (0.53)**	**< .001**
Social	**1.02 (0.27)**	**< .001**	**0.55 (0.22)**	**.011**	**0.29 (0.06)**	**< .001**	**2.01 (0.50)**	**< .001**
Conformity	0.16 (0.65)	.811	1.10 (0.69)	.107	0.03 (0.02)	.083	**2.89 (0.58)**	**< .001**

Note. Models were specified as in Figure 4.1 in two separate runs, where the dependent variable was specified as either drinking occasions per week (frequency) or total number of drinks consumed per week divided by the number of drinking days (quantity). Age was specified as a covariate at the between-subjects level in all models. Unstandardized path coefficients are reported as they are more comparable across samples than standardized estimates. CAM = coping-anxiety motives; CDM = coping-depression motives; Enhancement = enhancement motives; Social = social motives; Conformity = conformity motives. Bolded coefficients are significant at $p < .05$.

Table 4.4. Multilevel Actor-Partner Interdependence Model Fit Statistics

Outcome: Frequency						
	χ^2	*CFI*	*TLI*	$SRMR_{within}$	$SRMR_{between}$	*RMSEA*
CAM	**618.97**	1.00	1.00	.01	.02	.04
CDM	**612.36**	.99	.98	.01	.03	.03
Enhancement	**710.57**	1.00	.99	.01	.03	.02
Social	**762.65**	1.00	1.00	.01	.02	.00
Conformity	**581.44**	1.00	1.00	.01	.02	.00
Outcome: Quantity						
	χ^2	*CFI*	*TLI*	$SRMR_{within}$	$SRMR_{between}$	*RMSEA*
CAM	**240.63**	.97	.90	.01	.08	.04
CDM	**226.44**	.97	.91	.02	.08	.03
Enhancement	**268.26**	.96	.87	.02	.08	.04
Social	**278.00**	.96	.84	.02	.08	.05
Conformity	**232.08**	.97	.91	.01	.09	.03

Note. Chi-squared (χ^2) goodness of fit $df = 21$ across models. Bolded χ^2 goodness of fit tests are significant at $p < .001$.

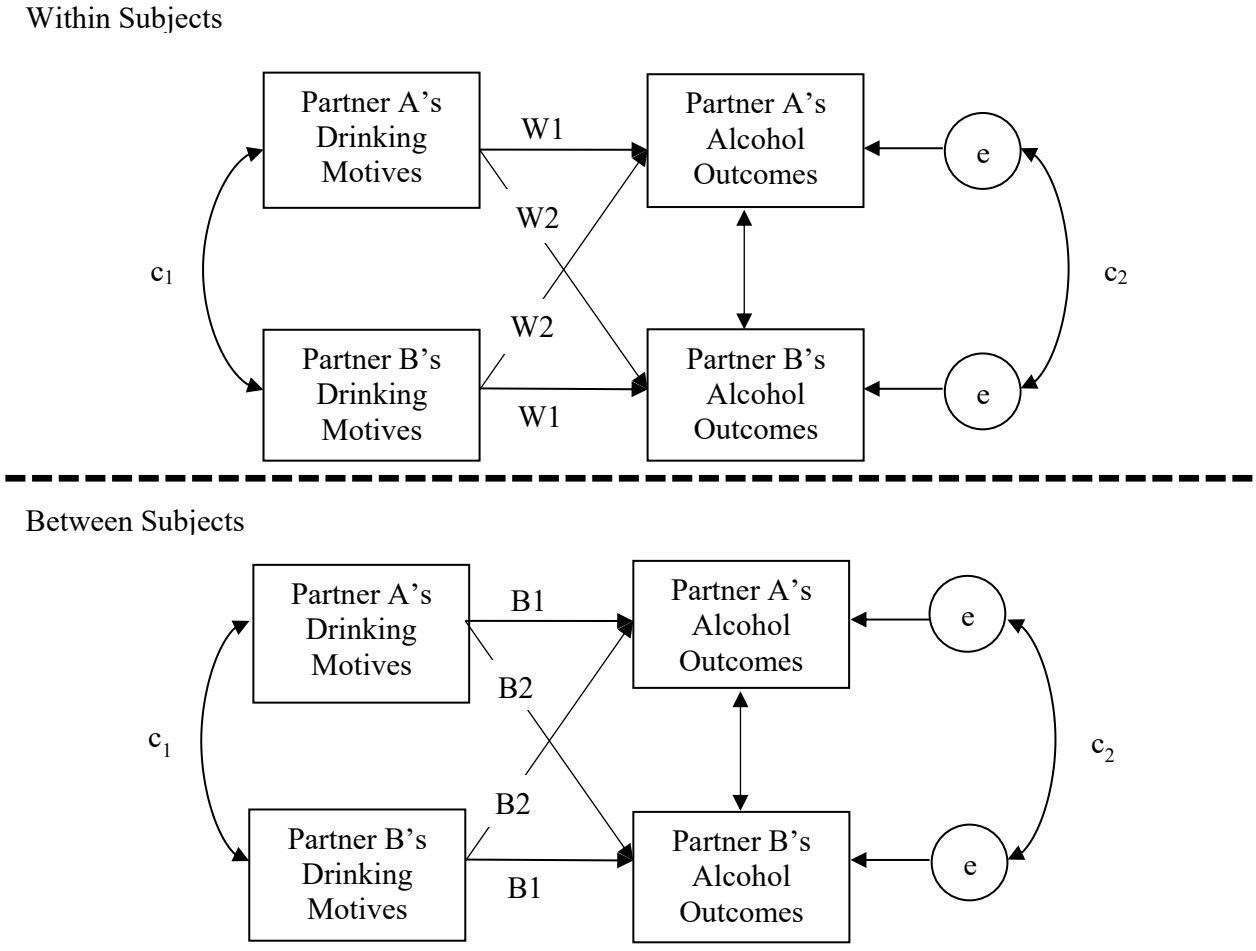

Figure 4.1. Multilevel APIM path diagram. Squares indicate observed variables, ovals indicate residual error. Single-headed arrows indicate paths, double-headed arrows indicate covariances. In multilevel path-analysis, the variance is partitioned into within-subjects and between-subjects components. Indistinguishable dyads were specified so paths were constrained to equality across partners; paths that share the same label (e.g., W2) were constrained to be equal. Actor effects are paths W1 and B1 whereas partner effects are paths W2 and B2. Ten models were tested in our study by using five separate drinking motive predictors (i.e., conformity, enhancement, coping-depression, coping-anxiety, and social) and two separate alcohol outcomes (i.e., total number of drinks consumed per week divided by the number of drinking days [quantity], and drinking occasions per week [frequency]).

CHAPTER 5: TRANSITION FROM STUDY 2 TO 3

Study 1 (Chapter 2) and Study 2 (Chapter 4) applied Grant et al.'s (2007) five-factor version of Cooper's (1994) model of drinking motives to social influence within romantic couples. Study 1 demonstrated that couples were similar on their overall drinking motives and drinking behaviour profiles. Study 2 built on Study 1 by utilizing longitudinal methodology to investigate individual motive influence (Bandura, 1977) on drinking behaviour within couples over time. Overall, partners' positive reinforcement drinking motives (enhancement and social), as well as partners' coping-anxiety motives, positively predicted individuals' drinking quantity both at the within-subjects (i.e., during any given week) and at the between-subjects (i.e., when averaged across the four weeks) level. In summary, Study 1 and Study 2 were the first to investigate drinking motives within couples and showed that couples are indeed influenced to drink by the drinking motives of their partners over time.

My first two studies focused on drinking motives within romantic couples given the importance romantic relationships play in the lives of emerging adults (Gilmartin, 2005). Focusing on this important relationship provides avenues for intervention given alcohol use plays an influential role in committed relationships (Derrick & Leonard, 2016). Moreover, emerging adults are at a period in their lives where the most important social influences on their behaviour shifts from parental influence to peer and partner influence (Borsari & Carey, 2001). Overall, peer drinking is predictive of emerging adult drinking behaviour, where young people often associate with individuals who drink heavily and escalate their own drinking over time as a result (McCabe et al., 2005; Simons-Morton, 2007). While overall peer influence occurs via overt drinking behaviours, researchers have begun to investigate a specific dyadic relationship that is especially predictive of risky drinking behaviour, namely

drinking buddies (i.e., someone an individual chooses to go drinking with; Reifman et al., 2006). These relationships are predictive of increased drinking over and above other peer relationships (Leonard et al., 2000; Reifman et al., 2006). Moreover, the number of drinking buddies in the social network is predictive of heavy drinking over time, and this influence is mediated by alcohol expectancies (Lau-Barraco et al., 2012). This finding suggests that consistent with SLT, drinking buddies influence drinking behaviour by modeling alcohol expectancies related to social facilitation.

Given Study 2 investigated drinking motive influence within romantic couples, it was important that Study 3 replicate and extend these findings to drinking buddy relationships using a similar methodology. Replication in research is an important component of cumulative science (Asendorpf et al., 2013; Brandt et al., 2014). Indeed, replications are essential for theoretical development through confirmation and disconfirmation of effects (Lakens, 2012). Moreover, extending findings into different study populations increases the generalizability of findings, and findings that apply to a wide variety of populations have greater scientific value than findings that apply to only a single population (Bonett, 2012). Limited research among adolescent friendships suggest friends' motives confer influence on individual youth's drinking behaviour via change in individual drinking motives (Stewart et al., 2014), similar to findings in Study 2 with romantic partners. Moreover, college student friends influence each other to drink via their drinking motives over a 28-day period (Hussong, 2003). Drinking motives are also predicted by classmates' drinking motives among adolescents (Kuntsche & Stewart, 2009). To date, no research had investigated drinking motives within drinking buddy relationships. Given drinking buddies exert considerable influence on the drinking of emerging adults (Lau-Barraco & Linden, 2014), and given the importance of replication and generalization of results in cumulative

science (Bonett, 2012; Brandt et al., 2014), it was important to investigate whether drinking motive results from Study 2 replicate and extend to this important dyadic relationship. A conceptual replication of partner effects from Study 2 would provide cumulative evidence regarding the influence of drinking motives (Cooper et al., 2016) within the social environment, and have further implications for the treatment and prevention of alcohol use disorders within emerging adults.

In Study 2, romantic couples were measured over a brief 4-wave, 4-*week* period; in order to investigate potential influence over a longer time period, and given past research had investigated drinking motive influence among friends during a short, 28-day period (Hussong, 2003), drinking buddies were investigated over a 4-wave, 4-*month* period. Moreover, drinking buddies were recruited within the first year of their relationship in order to better investigate influence within relatively new relationships (Reifman et al., 2006). By utilizing otherwise identical methodology as Study 2, similar questions were able to be investigated in Study 3. Specifically, I hypothesized both individual and drinking buddy enhancement, social, and coping-anxiety motives would influence individual drinking behaviour. These hypotheses were based on drinking motives theory (Cooper et al., 2016) and the results from Study 2 where partner influence was specific to the aforementioned motives. I also investigated whether drinking motives resulted in increased alcohol use over time, as well as when averaged over time, by utilizing multilevel APIMs. As in Study 2, this allowed for tests of co-occurring change during any given wave, a socialization process (Bandura, 1977). Moreover, sex was explored as a potential moderator given it is unclear whether male and female drinking buddies influence each other to varying degrees (Leonard & Homish, 2008; Reifman et al., 2006). Finally, if drinking buddy motives influenced individual emerging adults to use alcohol more frequently and/or heavily, I planned to

investigate whether change in individual drinking motives mediated such influence. Alcohol expectancies are likely a mechanism by which drinking buddies exert their influence on other's alcohol use (Lau-Barraco et al., 2012), and Study 2 tested whether motives similarly mediated this social influence. Thus, Study 3 attempted to replicate and extend Study 2's results to another important emerging adult relationship while continuing to explore drinking motives from a SLT perspective.

CHAPTER 6. STUDY 3: THE INFLUENCE OF DRINKING BUDDIES: A LONGITUDINAL INVESTIGATION OF DRINKING MOTIVATIONS AND DRINKING BEHAVIORS IN EMERGING ADULTS

The manuscript prepared for this study is presented below. Readers are advised that Ivy-Lee Kehayes, under the supervision of Dr. Sherry Stewart and Dr. Sean Mackinnon, was responsible for developing the research hypotheses, collecting the data, preparing the dataset for analyses, conducting the analyses and interpreting the study results. Ivy-Lee wrote the initial draft of the manuscript; she received and incorporated feedback from her co-authors. Ivy-Lee submitted the manuscript to *Substance Use and Misuse* in March 2020 for peer review and received a revise and resubmit in June 2020. Ivy-Lee will respond to reviewers and lead each round of revisions. See Appendix F for copyright permission from all co-authors. The current reference is as follows:

Kehayes, I. L., Mackinnon, S. P., Sherry, S. B., Leonard, K. E., & Stewart, S. H. (revisions requested June 2020). The influence of drinking buddies: A longitudinal investigation of drinking motivations and drinking behaviours in emerging adults. *Substance Use and Misuse.*

Abstract

Background: Heavy alcohol consumption and frequent alcohol use are associated with many adverse social and physical consequences. The different motivations underlying why people drink predict different patterns of alcohol consumption. A drinking buddy (i.e., a friend with whom a person drinks alcohol) influences a person's drinking via social learning, leading to escalations in drinking over time. **Purpose:** While research has investigated other aspects of influence in drinking buddy relationships (e.g., descriptive and injunctive norms), few studies have investigated drinking motives among peers or whether the drinking motives of a drinking buddy can influence another person's drinking behaviour. **Method:** Same-sex drinking buddies (N = 174; 66.1% female) were assessed once monthly for four months using self-report questionnaires. Participants were on average 18.66 years-old (SD = 1.17). Indistinguishable actor-partner interdependence models using multilevel path analysis were conducted, with each drinking motive predicting drinking frequency and quantity, respectively. **Results:** There were significant actor effects for social, enhancement, and coping motives; moreover, the enhancement, social and coping-anxiety motives of one drinking buddy influenced the other drinking buddy's drinking frequency across the four months of the study. Conversely, only the enhancement motives of one buddy predicted drinking quantity in the other when averaged across time. Sex was not a significant moderator of these effects. **Importance:** When targeting risky drinking behaviour in a therapeutic context, assessing and addressing a person's reasons for drinking, as well as their drinking buddy's reasons for drinking, may reduce the risk of escalations in either friend's drinking frequency over time.

Keywords: alcohol use; drinking buddies; drinking motives; social learning theory; longitudinal

Introduction

Alcohol use is extremely common among young people, with 82.8% of emerging adults (17-25 years) drinking alcohol in the past year (Health Canada, 2016). Excessive alcohol use peaks during this period (Patrick et al., 2019) and is associated with over 200 health consequences, including cardiovascular and gastrointestinal diseases, and cancers (World Health Organization, 2014). Social costs of alcohol misuse are also high, including damaged relationships, violence, and impaired driving (Public Health Agency of Canada, 2016). Alcohol consumption has many determinants, including underlying motivations (Cooper, 1994), and the social environment (Bandura, 1971). Given the negative outcomes associated with alcohol misuse, investigating how these different factors contribute to drinking behaviour is crucial.

Drinking Motives Theory

According to drinking motives theory (Cox & Klinger, 2004), people drink to achieve desired outcomes. Drinking motivations can be described in terms of their valence (i.e., positively or negatively reinforcing), and source (i.e., internal or external). Crossing these dimensions yields four core drinking motivations: social (positive-external; to increase affiliation), conformity (negative-external; to avoid social rejection), enhancement (positive-internal; to increase positive affect), and coping (negative-internal; to reduce negative affect; Cooper, 1994). More recently, Cooper's four-factor model of motives was modified where the generic coping motive was split into distinct coping-depression and coping-anxiety factors (Grant et al., 2007). Some drinking motives are riskier than others in terms of their associations with alcohol outcomes. Enhancement motives are the most stable predictors of heavy alcohol consumption (Cooper, 1994). When controlling other motives, social motives are modestly associated with drinking quantity and frequency (Kuntsche et al., 2005).

Coping-depression and coping-anxiety motives are positively associated with alcohol-related problems (Grant et al., 2007; Grant et al., 2009). Conformity motives are negatively associated with alcohol frequency/quantity, but positively associated with alcohol-related problems (Cooper et al., 2016). Drinking motives are theorized to be the most proximal influence on drinking behaviour and are the route by which other more distal influences (e.g., personality or social influences) predict alcohol consumption (Cooper, 1994; Kuntsche et al., 2008). It is therefore important to investigate how motives influence others as they have a direct impact on heavy drinking behaviour.

Social Learning Theory

Though drinking motivations are strong predictors of alcohol use within individuals, the social context in which drinking occurs is also highly influential. Alcohol use in emerging adults is embedded within a social context (Christiansen et al., 2002); most drinking occurs with others. Social learning theory (SLT; Bandura, 1971) proposes individuals observe the behaviour of models in their environment and adopt models' behaviours themselves through vicarious reinforcement. As a result, humans do not need to directly experience the consequences of a behaviour to learn that it is reinforcing, we simply have to witness it being reinforced in others. Thus, SLT proposes it is not only personally experienced consequences that regulate behaviour, but also consequences observed in others (Akers, 1985; Bandura, 1977). Similarly, others' motivations may be inferred and adopted when witnessing the antecedents and consequences of others' overt behaviour. This theoretical framework suggests emerging adults indirectly learn to drink to obtain the same rewards from drinking they have observed among others in their social environment.

Literature Review

In emerging adulthood, peer relationships are one of the most influential factors

when it comes to college drinking (Borsari & Carey, 2001); being surrounded by heavy drinkers increases the amount of alcohol a student drinks over time (DeMartini et al., 2013). It might not be the overall network or number of drinkers in the network that results in alcohol use, but rather the drinking of particularly influential network members. A "drinking buddy" (i.e., a friend with whom one goes drinking; Reifman et al., 2006), may be especially influential with respect to emerging adult drinking (Lau-Barraco & Linden, 2014). In fact, the presence of drinking buddies predicts alcohol misuse one year later (Reifman et al., 2006), and heavy drinkers' social networks consist of more drinking buddies than regular drinkers' networks (Leonard et al., 2000). Moreover, the number of drinking buddies in the social network has been shown to be predictive of heavy drinking and alcohol problems four years later (Leonard & Homish, 2008). Given peers (particularly drinking buddies) influence alcohol consumption, it is important to investigate mechanisms underlying this social influence.

Alcohol expectancies, as well as descriptive and injunctive norms, are often modeled between peers (Borsari & Carey, 2001; Lau-Barraco et al., 2012). Thus, peers may also model drinking motivations. SLT predicts that the observation of drinking motives rewarded in valued peers would result in adoption of those same motivations, and the behaviours that follow. Adoption of motives could occur via active exchange (e.g., a friend verbalizing how alcohol enhances positive emotions) or via passive learning (e.g., a person witnesses their friend drink after expressing feelings of sadness). Indeed, limited prior work suggests drinking motives confer influence via a socialization process. Adolescent drinking motives (enhancement, conformity, coping, and social) are positively predicted by classmate drinking motives (Kuntsche & Stewart, 2009), demonstrating motives can be transmitted via peer social influence. Moreover, a peer group's drinking motives influence an adolescent's own

drinking motives, which subsequently influence that adolescent's drinking levels (Stewart et al., 2014). Hussong (2003) used a 28-day, prospective design in friendship dyads to show college students' alcohol use was influenced by their own drinking motives as well as the drinking motives of their friend. Finally, in an emerging adult sample, both an individual's own drinking motives as well as the enhancement, social, and coping-anxiety motives of their romantic partner influenced the individual's alcohol use over a four-week period (Study 2 of the present thesis; Kehayes et al., 2019). In summary, emerging evidence suggests an individual's drinking behaviours may be influenced by their romantic partner's or peer's drinking motives through a social learning process.

Rationale and Gaps in the Literature

Given emerging adults drink heavily (Naimi et al., 2003) and experience significant alcohol-related problems (Hingson et al., 2009) which are likely socially-driven (Lau-Barraco & Linden, 2014), it is important to understand how peer relationships influence alcohol use. Given the importance of both drinking buddies (Lau-Barraco & Linden, 2014) and drinking motives (Cooper et al., 2016) on emerging adults' drinking behaviour, it is important to test if an individual's drinking behaviour is influenced by their drinking buddy's motivations for alcohol use. By understanding the way drinking buddies influence each other's behaviour, we may be better able to tailor early interventions to reduce risky alcohol use within this population.

Given drinking motive partner effects in romantic couples (Study 2's results; Kehayes et al., 2019), it is important to extend this to drinking buddies, an influential relationship in emerging adulthood (Lau-Barraco & Linden, 2014), while also improving upon past research. Hussong (2003) investigated three specific drinking motives (i.e., social, coping and enhancement motives) and close friends within a social context. We extended

Hussong's (2003) work by investigating five distinct drinking motives (Grant et al., 2007) in drinking buddies, a relationship that appears to be more influential on emerging adult drinking than other peer relationships (Lau-Barraco et al., 2012). Hussong (2003) utilized a 28-day framework that sampled frequency of drinking and problematic use daily; however, daily drinking data were collapsed across the 28 days and drinking motives were only measured at baseline. The present study utilized a four-wave, four-month longitudinal design with motives and drinking behaviour assessed at each wave. We also employed actor-partner interdependence models (APIM; Cook & Kenny, 2005) which measure both actor effects (i.e., the effect of the individual's motives on their own drinking behaviour) and partner effects (i.e., the effect of the drinking buddy's motives on the individual's drinking behaviour) and account for interdependence within dyads. We also included two distinct measures of drinking behaviour: days spent drinking per month (frequency) and the total number of drinks consumed per month divided by the number of drinking occasions (quantity). Finally, we investigated whether the influence of buddies' drinking motives on individuals' drinking behaviour occurs indirectly via changes in individuals' own drinking motives, given similar mediational findings in adolescent peers (Kuntsche & Stewart, 2009) and romantic couples (Study 2 of the present thesis; Kehayes et al., 2019). Identifying individual motive change as a mediator would provide a mechanism for how drinking buddy motives effect change in individual drinking behaviour.

Hypotheses

Enhancement and social motives are the strongest predictors of drinking behaviour in adult samples (Cooper et al., 2016). Moreover, an individual's drinking behaviour is influenced by their romantic partner's enhancement, social, and coping-anxiety motives (Study 2 of the present thesis; Kehayes et al., 2019). Thus, we hypothesized these three

motives in drinking buddies would predict individual drinking behaviour. Our hypotheses were as follows:

H1: The individual's enhancement, social, and coping-anxiety drinking motivations would positively predict the individual's own drinking frequency and quantity (i.e., actor effects).

H2: The drinking buddy's enhancement, social, and coping-anxiety drinking motivations would positively predict the individual's drinking frequency and quantity (i.e., partner effects).

H3: The drinking buddy's enhancement, social, and coping-anxiety drinking motivations would have an indirect effect on the individual's drinking frequency and quantity by influencing the individual's own enhancement, social, and coping-anxiety drinking motivations, respectively.

H4: The predictions proposed in H1, H2 and H3 would hold at the within-subject (i.e., change within any given month) and between-subject levels (i.e., averaged across all months).

Cooper et al.'s (2015) meta-analysis suggests the effect of coping and conformity motives on drinking frequency and quantity tends to be small relative to social and enhancement motives' effects on these drinking outcomes, and Study 2 of the present thesis (Kehayes et al., 2019) found coping-depression and conformity motives did not predict drinking within romantic partners. Therefore, our analyses for conformity and coping-depression motives were exploratory. Moreover, findings are mixed regarding whether male and female drinking buddies influence each other to varying degrees, with some studies showing no sex differences (Reifman et al., 2006), and others not testing sex differences (Leonard & Homish, 2008). Therefore, questions of moderation by sex were exploratory:

RQ1: Do coping-depression, and/or conformity motives have positive actor and/or partner

effects when predicting drinking frequency and/or quantity?

RQ2: Are there sex differences in the actor and/or partner effects described in H1 and H2?

Method

Participants

Drinking buddy dyads were recruited through online advertisements, posters, and via the psychology research pool.[5] The sample consisted of 174 same-sex drinking buddies (115 female [66.1%] and 59 male [33.9%] pairs). Participants' mean age at baseline was 18.66 (*SD* = 1.17) years, and most were Caucasian (79.3%) and university students (84.8%) with a minority cohabitating at baseline (21.0%). They were friends for an average of 4.05 months (*SD* = 2.21; range = 1.40 weeks to 1 year) and had frequent face-to-face contact with their drinking buddy (*M* = 19.75, *SD* = 7.60, days/month).

Measures

Modified Drinking Motives Questionnaire-Revised (Modified DMQ-R; see Appendix G)

Drinking motives were assessed using a 30-day version of the M-DMQ-R (Grant et al., 2007), a 28-item, self-report measure that assesses participants' scores on five motives subscales: coping-anxiety (e.g., *To forget my worries*), coping-depression (e.g., *To numb my pain*), enhancement (e.g., *To get a high*), conformity (e.g., *To fit in with a group I like*), and social (e.g., *To be sociable*). Participants rated how much each item related to their reasons for drinking over the past 30 days on a relative frequency scale ranging from 1 (*almost never/never*) to 5 (*almost always/always*). The 30-day version correlated strongly with the original M-DMQ-R in the present sample at baseline (*r*s = .86-89).

Self-administered Timeline Follow-Back (STLFB; see Appendix H)

[5]One research paper has been published utilizing a subsample of this dataset. It examined the social matching of alcohol consumption in drinking buddy dyads, and the impact of extraversion on this drinking behaviour (Nogueira-Arjona et al., 2019).

Drinking frequency and quantity were measured using the STLFB (Collins et al., 2008), a calendar-based self-report measure used to track alcohol use over the past 30 days. A standard drink was defined as 5-ounces of wine, a drink containing one shot of liquor or spirits, or 12-ounces of beer or cooler. STLFB data was used to calculate frequency of drinking days (i.e., the number of drinking days/month) and quantity/occasion (i.e., the sum of drinks consumed/month divided by the number of drinking days). The STLFB has been effectively used to measure drinking behaviour in other dyadic studies (e.g., Study 2 in the present thesis; Kehayes et al., 2019).

Procedure

Drinking buddies were recruited if they (a) were of the same sex, drank together, and were not romantically involved with one another; (b) were friends who had known each other for a year or less; (c) both had regular internet access at home; (d) included at least one first-year undergraduate; (e) were both between the ages of 18–25 years; and (f) had both consumed at least 12 alcoholic drinks in the past year. These criteria were used to ensure all friends were engaging in drinking behaviour together and were in a relatively newer friendship where social influence would be likely to happen. Dyads completed questionnaires online and only came into the lab to complete the baseline questionnaire. Follow-up questionnaires were completed online at home to increase retention. Participants were each sent a secure link to their questionnaire in an email that contained their individual identification code. Survey links remained open for 24-hours. If a questionnaire was missed, participants were sent a make-up survey via a link available for 24-hours. Make-up surveys were sent out every day for up to seven days after the original survey. After 7 days, participants were sent three weekly reminders until the end of the 30 days. At this point, the survey was considered missed if the participant did not respond. If a participant completed a

make-up survey, the instructions were modified so that the measures referred to the time-period that each member of the dyad was supposed to complete the survey. To encourage retention, participants were provided with an extra $5.00 each if both dyad members completed their surveys on the originally scheduled day. At study completion, participants were debriefed via email and compensated via cash and/or psychology course credit.

Data Analytic Strategy

Missing data and protocol compliance were assessed by analyzing the proportion of make-up surveys completed and by examining missing data. Descriptive statistics, including means, standard deviations, internal consistencies, and intraclass correlations (ICCs), were calculated along with multilevel bivariate correlations. Multilevel Cronbach's alpha was utilized to calculate within- and between-subject internal consistencies (Geldhof et al., 2014).

Hypotheses were tested using APIMs (Kenny & Ledermann, 2010) within a multilevel path-analysis framework. Ten APIMs were modeled to test the effects of five drinking motives on two alcohol outcomes (frequency, quantity). Given the longitudinal data, multilevel path-analyses with fixed slopes and random intercepts were utilized (Preacher et al., 2010), which partitions the variance into within-subject and between-subject components. The within-subjects level represents change in the same direction within any given month (e.g., did enhancement motives and alcohol frequency change in the same direction within any given month?). The between-subjects level represents the portion of the variance that did not change across the four months (e.g., when scores are averaged across four months, were enhancement motives and drinking frequency related?). A multilevel APIM model can be found in Figure 6.1. A root-mean-square error of approximation (RMSEA) < .06, a standardized root-mean-square residual (SRMR) < .08, and a CFI and TLI

> .95 indicated excellent model fit (Kline, 2011). To account for any violation of the normality assumption, a robust estimator of fit indices and standard errors was used (MLR estimation). A full information maximum likelihood approach was used (Enders & Bandalos, 2001), which employs all available data to adjust parameters and standard errors to account for missing data. To minimize the influence of a few extreme cases, we removed any values larger than three SDs above the group mean (7 data points; 2.01% of data).[6]

The 95% confidence intervals for indirect effects were assessed using the delta method in Mplus (using the MODEL CONSTRAINT command; Muthén & Muthén, 2017). Sex differences were explored by examining nested APIM models comparing constrained-across-sex models to unconstrained models where paths and covariances were permitted to vary freely across sex. The model with the lower Bayesian Information Criterion (BIC) value was considered to have the better fit, with ΔBIC 2-6 indicating positive evidence, ΔBIC 6-10 representing strong evidence, and ΔBIC 10+ indicating very strong evidence (Raftery, 1995). If the unconstrained model fit the data better than the constrained model, this indicated significant sex differences.

Results

Compliance and Missing Data

Compliance rates were high; drinking buddies completed on average 3.49 (*SD* = 0.93) of four waves, with 70.7% completing all four waves. At wave 2, 62.6% completed their survey on the scheduled date, 27.3% completed a make-up survey, and 10.1% failed to complete their survey. At wave 3, 62.9% completed their survey on the scheduled date, 22.4% completed a make-up survey, and 14.7% failed to complete their survey. At wave 4, 44.0% completed their survey on the scheduled date, 29.6% completed a make-up survey,

[6]Results remained consistent with or without the outliers included.

and 26.4% failed to complete their survey. An average of 30.44 days (*SD* = 2.95) elapsed between completed surveys.

Missing data varied by wave. Skip logic was used such that participants did not complete the DMQ-R if they did not consume alcohol that month. Therefore, analyses incorporated only data from months where alcohol was consumed by at least one buddy.[7] At wave 1, 0.6% of participants did not drink alcohol the previous month and thus did not have drinking motives to report; and at waves 2, 3 and 4, 4.0%, 7.2%, and 11.2% of participants, respectively, did not drink alcohol the previous month.

Descriptive Statistics, Bivariate Correlations, and Intraclass Correlations

Means and standard deviations on all study measures are presented in Table 6.1. Drinking frequency ranged from 1-23 drinking occasions/month and drinking quantity ranged from 1-17 alcoholic beverages/occasion. Bivariate correlations at the within-subjects and between-subjects levels appear in Table 6.2. Most variables were correlated as expected. At the within- and between-subjects level, all five drinking motives were positively intercorrelated (*r*s = .22-.57 within; .30-.77 between). Drinking quantity was positively correlated with coping-depression and coping-anxiety motives at the between-subjects level and with enhancement and social motives at both levels. Drinking frequency was positively correlated with coping-depression, coping-anxiety, enhancement, and social motives at both levels. Correlations tended to be larger at the between-subjects level. Alphas ranged from .85-98 (between-subjects) and from .65-.92 (within-subjects) suggesting good to excellent

[7]Similar to Study 2 of the present thesis (Kehayes et al., 2019), drinking outcomes for abstainers on any given month were coded as missing data as opposed to zeros. This meant that when only one buddy drank in a specific month, their data was used to calculate actor effects (but not partner effects). When both buddies drank in a specific month, their data was used to calculate actor and partner effects. When both buddies did not drink in a specific month, they were excluded from the model.

reliability, save for within-subjects coping-anxiety motives which was acceptable. ICCs suggested ~45% (drinking frequency) to ~71% (enhancement motives) of the variance was at the between-subjects level.

Multilevel Path-Analysis

Ten models were specified, with each of the five drinking motives predicting each alcohol outcome: frequency and quantity. These models are depicted in Figure 6.1 and were analyzed using indistinguishable dyads given drinking buddies were same-sex. All fit indices, except the chi-squared (χ^2) goodness of fit test, suggested models fit the data well (see Table 6.4 for fit statistics). Unstandardized path coefficients and covariances for all models appear in Table 6.3. Significant findings for actor and partner effects at $p < .05$ are noted below. Overall, nearly all of the actor effects were significant predictors of both frequency and quantity of drinking at the within- and between-subjects levels, with the exception of conformity motives. In contrast, partner effects were significant primarily with respect to drinking frequency at the within-subjects level.

Actor enhancement motives were associated with greater actor drinking frequency and quantity at the within- and between-subject levels, and partner enhancement motives were associated with actor drinking frequency at the within-subjects level, and with actor drinking quantity at the between-subjects level. Actor social motives were associated with greater actor drinking frequency and quantity at the within- and between-subject levels, and partner social motives were associated with actor drinking frequency at the within-subjects level.

Actor coping-anxiety motives were associated with greater actor drinking frequency at both the between- and within-subject levels; actor coping-anxiety motives were associated with greater actor drinking quantity at the between-subjects level. Partner coping-anxiety

motives were associated with greater actor drinking frequency at the within-subjects level. Actor coping-depression motives were associated with greater actor drinking frequency at the between- and within-subjects level; actor coping-depression motives were associated with greater actor drinking quantity at the within-subjects level. Actor conformity motives were associated with greater actor drinking quantity at the within-subjects level. All covariances were positive and statistically significant, suggesting drinking buddies are similar in motives and alcohol use.

Effect Sizes

R^2 values at the between- and within-subject levels were calculated as estimates of standardized effect sizes for both alcohol outcomes (Table 6.4). Despite equality constraints placed on the indistinguishable dyads, variances can differ across partners causing R^2 values to vary (Kline, 2011). Therefore, R^2 values for both partner A and partner B are reported.

Indirect Effects and Moderation by Sex

Indirect effects testing for mediation are displayed in Appendix D (Table D.5). Partner social motives predicted actor drinking frequency through actor social motives at the within-subjects level. All other indirect paths were nonsignificant.

Nested APIM model comparisons by sex are presented in Appendix D (Tables D.6 and D.7). BIC values were always lower in the model constrained to equality across sex, with ΔBIC values ranging from 22.82-37.97 (see Appendix D, Table D.8) providing very strong evidence of no moderation by sex.

Discussion

The present study's aim was to investigate drinking motives' effects on drinking behaviour (Cooper, 1994) within the influential social context of emerging adult drinking buddy relationships (Lau-Barraco & Linden, 2014). Previous research has shown that

drinking motives can be transferred between classroom peers (Kuntsche & Stewart, 2009), a close friend's drinking motives can influence an emerging adult's drinking behaviour (Hussong, 2003), and drinking motives in the peer network can influence an adolescent's drinking motives which subsequently influence their own drinking behaviours (Stewart et al., 2014). Overall, results suggest that an individual's drinking behaviour is influenced not only by their own drinking motives but also by the drinking motives of their drinking buddy.

Consistent with hypotheses and past research (Cooper et al., 2016), people who endorsed higher drinking for enhancement and social reasons tended to drink in higher quantities and more frequently when averaged across four months. Fluctuations in enhancement and social motives were also associated with fluctuations in both alcohol outcomes over the four months. These results add to research showing enhancement motives are related to heavy alcohol consumption (Cooper et al., 2016; Kuntsche et al., 2005), and result in escalations in drinking over time (Mackinnon et al., 2014). Moreover, drinking to increase social affiliation is associated with drinking quantity and frequency (Grant et al., 2007; Kuntsche et al., 2005). Our results add to this literature and suggest that emerging adults' social motives are related to drinking behaviours, at least when other motives are not controlled (Grant et al., 2007).

When split into separate constructs, coping-depression motives are associated with drinking levels, whereas coping-anxiety motives are more typically associated with alcohol-related problems (Grant et al., 2007). Study 2 of the present thesis (Kehayes et al., 2019) found coping-anxiety motives predicted drinking frequency and quantity in romantic partners, whereas coping-depression motives predicted only drinking frequency. Our results suggested emerging adults who drink to cope with their depression or their anxiety are both drinking more frequently and in higher quantities. Conversely, conformity motives predicted

drinking quantity in the actor at the within-subjects level only. Our general lack of conformity motive findings across alcohol outcomes is understandable given conformity motives are more likely associated with alcohol-related problems and less with alcohol use in general (Cooper et al., 2016).

When examining partner effects, drinking for enhancement reasons in the drinking buddy was associated with co-occurring changes in the actor's drinking frequency during any given month, and with increased drinking quantity in the actor when averaged across time. That is, drinking for enhancement reasons in one friend was associated with co-occurring changes in the other friend's drinking frequency during any given month, and with increased drinking quantity in the other friend when averaged across time. Drinking buddies' coping-anxiety motives predicted actor drinking frequency during any given month as well. Finally, drinking buddies' social motives predicted actor drinking frequency during any given month. Consistent with hypotheses, when averaged across time, this relationship was mediated by the actor's own social motives. That is, if a drinking buddy was motivated to drink for social reasons, the actor also tended to drink for social reasons which in turn was associated with increased drinking frequency in the actor. However, given this was the only indirect effect found among four significant partner effects, there are likely other important mechanisms through which a buddy's drinking motives effect change in an individual's drinking behaviour (e.g., injunctive and descriptive norms; Neighbors et al., 2008). For example, a person may believe drinking to cope with anxiety is normative if they see their drinking buddy drinking for that reason, which may in turn affect the person's drinking behaviour. Alternatively, our direct partner effects may suggest that if a drinking buddy feels the need to drink to increase their positive feelings, for example, and brings their friend along, that friend may be directly influenced to drink through that social contextual

interaction. Finally, sex did not significantly moderate our results, consistent with other drinking buddy research (Reifman et al., 2006). Additional work is needed to investigate whether male or female drinking buddies influence each other to differing extents as prior research suggests male and female drinkers are differentially influenced by other social factors (e.g., social alcohol expectancies being more influential among men than women; Lau-Barraco et al., 2012).

Our results replicate Hussong (2003) who found the enhancement, generic coping, and social motives of one friend at baseline predicted increased drinking frequency in the other friend when collapsed over a 28-day period. Our results extend her findings by utilizing Grant et al.'s (2007) five-factor model of drinking motives. While partner conformity motives were unrelated to actor drinking in the present study, our results suggest partner effects of coping motives within drinking buddies are specific to coping-anxiety motives. Study 2 of the present thesis (Kehayes et al., 2019) also found significant partner effects for only enhancement, social, and coping-anxiety motives in romantic partners. Thus, our results add to evidence suggesting internal motives (enhancement and coping) and social motives are likely perceivable by others and are more likely to effect change in close others (Kehayes et al., 2019; Stewart et al., 2014). While Hussong's (2003) design included a 28-day assessment of drinking relative to drinking motives measured only at baseline; we assessed motives and drinking behaviour across four time points which allowed us to examine co-occurring change over time, a methodology that more strongly suggests socialization as opposed to purely selection.

Many studies support the importance of peers generally, and drinking buddies specifically, in emerging adult drinking behaviour (Lau-Barraco & Linden, 2014; Wechsler et al., 1995). Our results suggest friends influence each other to drink not only through

modelling overt drinking behaviours (DeMartini et al., 2013), but also through modelling the motivations that underlie their drinking behaviours. These results add to the drinking motives literature by investigating the social context that surrounds motives as opposed to their influence on the individual only. Other theoretical accounts of the social benefits of alcohol consumption may also contribute to drinking buddy influence (Roberts et al., 2014). For example, shared alcohol use might enhance psychological wellbeing and promote the reinforcement of social bonds with others via endorphin release (Dunbar et al., 2017; Gianoulakis, 2004).

In our study, drinking buddies' motives were more predictive of increased actor drinking frequency than quantity. Study 2's (Kehayes et al., 2019) investigation of romantic partners found the opposite, where partner drinking motives predicted increased actor drinking quantity more so than frequency. This finding may be due to study design differences (i.e., four months versus four weeks), sample characteristics (e.g., length of relationship), and/or differences across friendships versus romantic relationships. For example, romantic partners may be more likely to drink as a dyad only, thus influencing the amount each other drink via SLT mechanisms. In contrast, drinking buddies may be more likely to encourage the individual to go out and drink with a group thereby influencing drinking frequency. While heavy drinking is associated with many negative health and social outcomes (Health Canada, 2016; Patrick et al., 2019), drinking frequency also seems to predict negative outcomes. Risk of death from alcohol-related illness linearly increases with frequency of use (Rehm et al., 2008). High frequency drinking in late adolescence predicts harmful alcohol use several years later (Heron et al., 2013). Thus, it appears frequency of alcohol use is an important outcome to target in prevention/early intervention.

From an intervention perspective, it may be helpful to explore motivations for

drinking in friends of those who engage in problematic alcohol use, given the influence their friends' motivations may have on the individuals' drinking frequency. In network therapy for substance abuse, the client's social network is included in the treatment process (Galanter, 2015). The client selects either a close friend or family member who then participates in therapy and supports the client as they progress through treatment. Given ours and others' results (Lau-Barraco & Linden, 2014), it may be particularly important to specifically discuss the drinking buddy's reasons for drinking in a therapy context. The buddy may not be aware of their own influence on the client's drinking, and such psychoeducation could be useful in preventing potential negative influence from occurring. Moreover, drinking motives have been successfully targeted in treatment in individual intervention, where underlying risky motivations are reduced, leading to a reduction in drinking behaviours (Conrod et al., 2011). This intervention might be adapted and utilized within a network therapy approach to specifically target risky drinking motives within the client's friendship network.

Limitations and Future Directions

With our design and chosen analytic strategy, we were unable to fully separate socialization and selection effects on drinking behaviour. Although we did recruit friendships that were at maximum six months long and although we found co-occurring change in drinking behaviour via drinking motivations over time, buddies may have selected each other based on similarity in drinking or motives before the study began. Future research could recruit drinking buddies who have just started their friendship, perhaps when first entering university, to see if they are similar in these constructs initially, and to see if influence occurs as their friendship progresses. We may lack statistical power to detect small effects due to our limited sample size, especially given conformity and coping motives are

weakly associated with alcohol use as compared to enhancement and social motives (Cooper et al., 2016). Lack of statistical power may have affected our ability to find mediational effects as well. Time lags that are shorter or longer may produce different results. Moreover, even though aspects of our design were virtually identical to Study 2's (Kehayes et al., 2019), our differing time lags makes it difficult to make direct comparisons across studies. Finally, our sample mainly consisted of young, student friends, and all drinking buddy dyads were same-sexed. Thus, future research may wish to focus on other dyads (e.g., older friendships, mixed-sex dyads) to determine generalizability.

Conclusions

We investigated drinking motivations (Cooper, 1994) within the social context of emerging adult "drinking buddy" relationships (Lau-Barraco & Linden, 2014). Past research showed friends could influence each other to drink via their drinking motivations (Hussong, 2003). We sought to extend this prior research to drinking buddies by using longitudinal methods. Results showed that the social, enhancement and coping-anxiety motives of a drinking buddy were predictive of drinking frequency in the actor over time. Thus, it appears that a person's drinking behaviour is influenced not only by their own motives but also by the motives of their drinking buddy. Individual and buddy drinking motives may therefore be important targets in network therapy to prevent risky drinking behaviours from escalating over time (Galanter, 2015).

Table 6.1. Descriptive Statistics

	Wave 1		Wave 2		Wave 3		Wave 4	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Coping with depression motives	1.42	0.69	1.37	0.59	1.33	0.60	1.38	0.77
Coping with anxiety motives	1.85	0.83	1.79	0.70	1.73	0.72	1.75	0.84
Enhancement motives	2.77	1.109	2.60	1.06	2.55	1.02	2.56	1.06
Conformity motives	1.27	0.64	1.31	0.54	1.31	0.59	1.34	0.69
Social motives	2.98	0.95	0.76	0.88	2.65	0.91	2.67	0.99
Drinking quantity	5.12	2.79	5.12	2.80	5.30	2.74	4.88	2.77
Drinking frequency	7.78	4.03	6.04	3.82	5.58	3.67	5.46	3.73

Note. M = mean; *SD* = standard deviation; Drinking frequency = drinking occasions per month; Drinking quantity = drinks per drinking day.

Table 6.2. Bivariate Correlations, Intraclass Correlations, And Reliability at Between- and Within-Subject Levels

Variable	1	2	3	4	5	6	7
1. Coping with depression motives	--	.59***	.33***	.57***	.22***	.04	.11*
2. Coping with anxiety motives	.77***	--	.48***	.44***	.40***	.04	.14***
3. Enhancement motives	.47***	.71***	--	.27***	.51***	.11***	.17***
4. Conformity motives	.52***	.51***	.30***	--	.27***	.04	.05
5. Social motives	.37***	.64***	.71***	.50***	--	.11**	.19***
6. Drinking quantity	.14*	.19**	.36***	.03	.29***	--	-.08
7. Drinking frequency	.24**	.30***	.33***	.01	.23**	.34***	--
ICC	.60	.60	.71	.53	.59	.66	.45
Alpha reliability (within-subjects)	.92	.65	.82	.84	.76	--	--
Alpha reliability (between-subjects)	.98	.85	.94	.92	.86	--	--

Note. Within-subject correlations are above the diagonal, and between-subject correlations are below the diagonal. ICC = intraclass correlation.

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

Table 6.3. Multilevel Actor-Partner Interdependence Model Coefficients

	Outcome: Frequency							
	Actor Effects		Partner Effects		Covariance: Predictor		Covariance: Outcome	
	B (*SE*)	*p*	*B* (*SE*)	*p*	*B* (*SE*)	*p*	*B* (*SE*)	*p*
Within Subjects								
CAM	**0.82 (0.25)**	**.001**	**0.53 (0.22)**	**.017**	0.02 (0.01)	.177	**2.81 (0.48)**	**< .001**
CDM	**0.95 (0.38)**	**.012**	0.56 (0.30)	.056	0.01 (0.01)	.520	**2.89 (0.49)**	**< .001**
Enhancement	**0.69 (0.18)**	**< .001**	**0.56 (0.18)**	**.002**	0.03 (0.02)	.140	**2.78 (0.51)**	**< .001**
Social	**0.82 (0.18)**	**< .001**	**0.64 (0.17)**	**< .001**	**0.05 (0.02)**	**.012**	**2.65 (0.51)**	**< .001**
Conformity	0.32 (0.41)	.428	0.30 (0.33)	.358	0.01 (0.01)	.440	**3.04 (0.52)**	**< .001**
Between Subjects								
CAM	**1.39 (0.40)**	**< .001**	0.49 (0.30)	.103	0.05 (0.03)	.118	**2.99 (0.75)**	**< .001**
CDM	**1.18 (0.44)**	**.007**	0.59 (0.36)	.101	**0.06 (0.03)**	**.044**	**3.01 (0.77)**	**< .001**
Enhancement	**0.92 (0.21)**	**< .001**	0.12 (0.20)	.529	0.10 (0.07)	.139	**3.16 (0.74)**	**< .001**
Social	**0.85 (0.26)**	**.001**	0.28 (0.25)	.262	0.01 (0.05)	.925	**3.19 (0.75)**	**< .001**
Conformity	0.32 (0.50)	.530	-0.12 (0.35)	.743	0.02 (0.02)	.356	**3.45 (0.81)**	**< .001**
	Outcome: Quantity							
	Actor Effects		Partner Effects		Covariance: Predictor		Covariance: Outcome	
	B (*SE*)	*p*	*B* (*SE*)	*p*	*B* (*SE*)	*p*	*B* (*SE*)	*p*
Within Subjects								
CAM	0.20 (0.14)	.132	0.06 (0.13)	.666	0.02 (0.01)	.166	**0.57 (0.19)**	**.003**
CDM	**0.40 (0.18)**	**.028**	-0.06 (0.13)	.677	0.01 (0.01)	.521	**0.58 (0.19)**	**.002**
Enhancement	**0.33 (0.09)**	**< .001**	0.01 (0.12)	.954	0.03 (0.02)	.139	**0.58 (0.19)**	**.002**
Social	**0.30 (0.10)**	**.003**	-0.12 (0.10)	.245	**0.05 (0.02)**	**.011**	**0.60 (0.19)**	**.002**
Conformity	**0.31 (0.15)**	**.047**	0.05 (0.14)	.707	0.01 (0.01)	.434	**0.57 (0.19)**	**.003**
Between Subjects								
CAM	**0.68 (0.24)**	**.005**	-0.01 (0.23)	.967	0.05 (0.03)	.119	**3.11 (0.63)**	**< .001**
CDM	0.51 (0.26)	.054	0.16 (0.25)	.529	**0.06 (0.03)**	**.045**	**3.09 (0.65)**	**< .001**
Enhancement	**0.87 (0.16)**	**< .001**	**0.32 (0.14)**	**.019**	0.10 (0.07)	.147	**2.60 (0.55)**	**< .001**
Social	**0.84 (0.21)**	**< .001**	0.27 (0.21)	.208	0.01 (0.05)	.907	**2.88 (0.60)**	**< .001**
Conformity	-0.05 (0.29)	.854	-0.10 (0.26)	.690	0.02 (0.02)	.357	**3.15 (0.64)**	**< .001**

Note. Models were specified as in Figure 6.1 in two separate runs, where the dependent variable was specified as either drinking occasions per month (frequency) or total number of drinks consumed per month divided by the number of drinking days (quantity). Unstandardized path coefficients are reported as they are more comparable across samples than standardized estimates. CAM = coping-anxiety motives; CDM = coping-depression motives; Enhancement = enhancement motives; Social = social motives; Conformity = conformity motives. Bolded coefficients are significant at $p < .05$.

Table 6.4. Multilevel Actor-Partner Interdependence Model Fit and R^2 Values

Outcome: Frequency								
	χ^2	*CFI*	*TLI*	$SRMR_{within}$	$SRMR_{between}$	*RMSEA*	R^2_{within} *(PA/PB)*	$R^2_{between}$ *(PA/PB)*
CAM	**126.54**	.99	.96	.02	.06	.03	0.03/0.03	0.10/0.11
CDM	**101.56**	.98	.95	.03	.05	.03	0.02/0.03	0.06/0.08
Enhancement	**132.62**	.99	.98	.04	.02	.02	0.04/0.04	0.08/0.10
Social	**129.75**	.99	.97	.04	.05	.02	0.06/0.06	0.05/0.06
Conformity	**78.87**	1.00	1.00	.02	.03	.00	0.00/0.00	0.00/0.00
Outcome: Quantity								
	χ^2	*CFI*	*TLI*	$SRMR_{within}$	$SRMR_{between}$	*RMSEA*	R^2_{within} *(PA/PB)*	$R^2_{between}$ *(PA/PB)*
CAM	**97.68**	1.00	1.00	.01	.05	.00	0.03/0.01	0.04/0.03
CDM	**86.34**	1.00	1.00	.02	.03	.00	0.01/0.01	0.02/0.02
Enhancement	**123.27**	1.00	1.00	.01	.02	.00	0.02/0.01	0.16/0.13
Social	**113.77**	.97	.91	.03	.05	.04	0.01/0.01	0.10/0.06
Conformity	**81.20**	1.00	1.00	.03	.03	.00	0.00/0.01	0.00/0.00

Note. Chi-squared (χ^2) goodness of fit $df = 12$ across models. Bolded χ^2 goodness of fit tests are significant at $p < .001$. PA = partner A; PB = partner b).

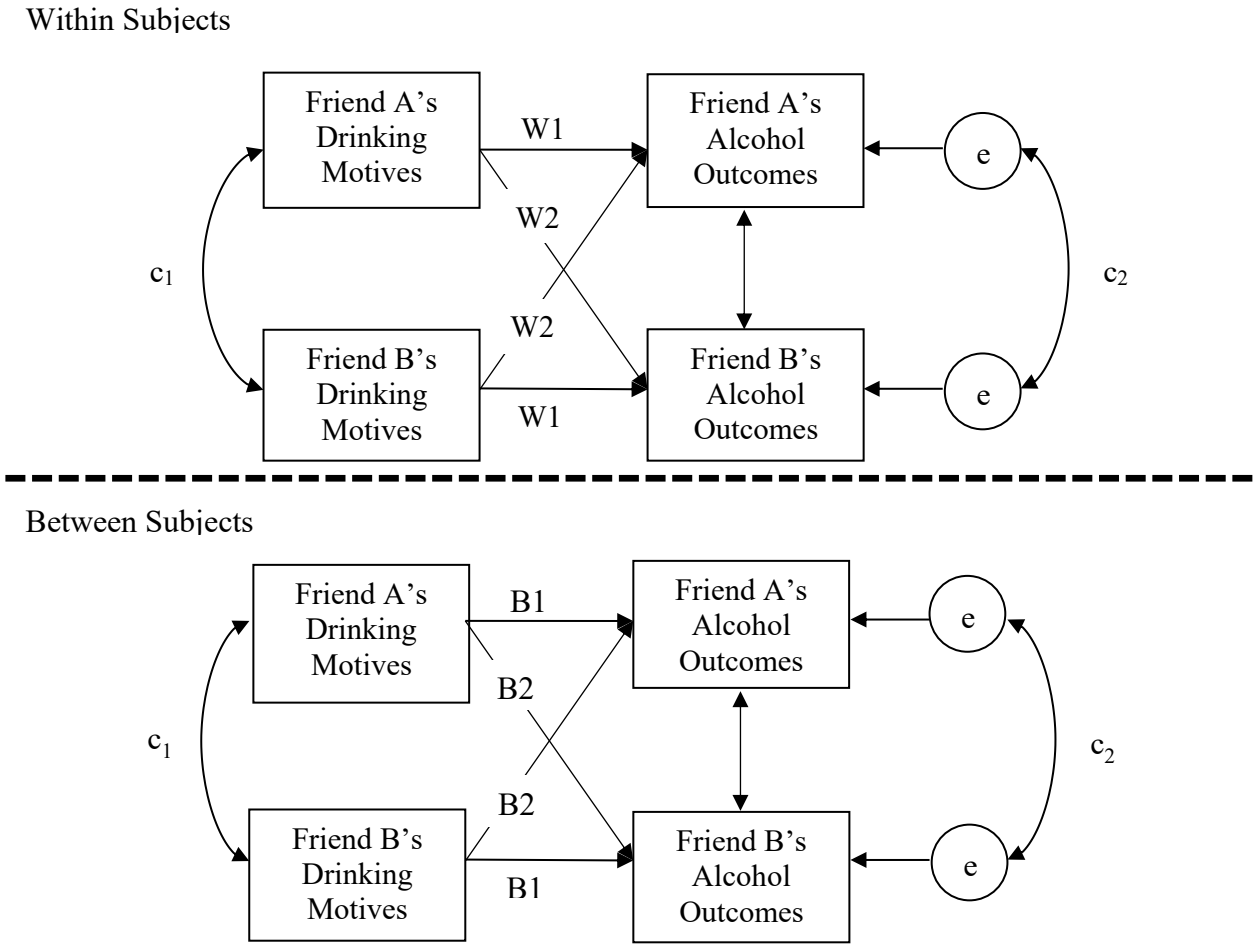

Figure 6.1. Multilevel APIM path diagram. Squares indicate observed variables; ovals indicate residual errors. Double-headed arrows indicate covariances; single-headed arrows indicate paths. In multilevel path-analysis, the variance is partitioned into within- and between-subject components. Indistinguishable dyads were specified so paths were constrained to equality across friends; paths that share the same label (e.g., W2) were constrained to be equal. Actor effects are paths W1 and B1 whereas partner effects are paths W2 and B2. Ten models were tested in our study by using five separate drinking motive predictors (i.e., enhancement, social, coping-depression, coping-anxiety, and conformity) and two separate alcohol outcomes (i.e., drinking occasions per month [frequency] and drinks per drinking day [quantity]).

CHAPTER 7. DISCUSSION

My dissertation sought to understand how emerging adult alcohol use is influenced by close interpersonal relationships. As a result, I investigated drinking motivations (Cooper, 1994) from a SLT perspective across three studies. The proceeding sections summarize and integrate my findings, as they pertain to the literature as a whole, as well as to this overarching goal. I then discuss my dissertation's theoretical implications, clinical implications, strengths, and limitations. Finally, I conclude by suggesting directions for future research.

Summary and Integration of Findings

Summary

Study 1 added to the extant literature by examining dyadic similarity of drinking behavioural and drinking motivational profiles within the social context of emerging adult romantic relationships. After establishing couples were indeed similar in terms of their drinking motives as well as drinking behaviours in Study 1, Study 2 extended Study 1's findings by investigating individual motive influence, a socialization process (Bandura, 1977). Moreover, Study 2 utilized longitudinal APIM analyses that tested for co-occurring influence over time, a clear improvement over Study 1's correlational analyses. Study 2 extended Study 1's findings by demonstrating that couples were not only similar in drinking motivations, but that partner motives (i.e., enhancement, social and coping-anxiety motives) could also influence individual drinking behaviour over time within couples. Given Study 2 investigated drinking motive influence in romantic couples, it was important that Study 3 conceptually replicate and extend these findings to another important emerging adult relationship, drinking buddies (Asendorpf et al., 2013; Brandt et al., 2014). Study 3 replicated and extended Study 2's findings into a different dyadic pairing by showing

drinking buddy motives (i.e., enhancement, social and coping-anxiety motives) influenced individual drinking behaviour over time within drinking buddies. Thus, Study 3 extended Study 2's results to another important emerging adult relationship and replicated past research that investigated drinking motives within general friendship dyads (Hussong, 2003). All three studies in my dissertation support the importance of investigating drinking motives within the social context and add to the extant literature of social influence on drinking behaviours within emerging adulthood. Results from all three studies are summarized in Table 7.1.

Integration

Similarity among couples and friends has been studied across health outcomes, personality, attitudes, beliefs, and alcohol consumption (Ask et al., 2012; McPherson et al., 2001). Most evidence suggests couples (Ask et al., 2012) as well as peers (McCabe et al., 2005) are similar in terms of their alcohol use. Some differences emerge when investigating certain types of alcoholic beverages (Kolonel & Lee, 1981), but overall, the literature suggests concordance on alcohol outcomes is related to relationship satisfaction and longevity (Linden-Carmichael et al., 2016). It was unclear if couples and drinking buddies were similar in terms of their underlying drinking motivations as well as drinking behaviours. It was important to establish drinking motive and behaviour similarity given the risk certain motives confer for heavy alcohol use (Cooper et al., 2016). Study 1 showed that romantic couples were similar in their overall drinking motives and drinking behaviours. Study 3 did not directly investigate overall drinking buddy motive similarity. To compare similarity across samples, I replicated analyses completed in Study 1 with the drinking buddies' data (see Table 7.2). One-sample *t*-tests showed the similarity profiles for drinking

behaviour were positive (M = .47, SD = .26) and significantly greater than zero.[8] Drinking motive similarity profiles were also positive (M = .15, SD = .38) and significantly greater than zero.[9] Thus, both drinking buddies and romantic couples are similar in their overall drinking motives and drinking behaviours. To further examine similarity across samples, independent samples t-tests were performed to test whether mean profiles across samples were significantly different. The drinking motive similarity profiles for romantic partners were significantly higher (i.e., significantly more similar; M = .25, SD = .36) than the drinking motives profiles for the drinking buddies (M = .15, SD = .38).[10] However, the drinking behaviour profiles were not significantly different across samples (M = .52, SD = .25 for romantic couples versus M = .47, SD = .26 for drinking buddies).[11] Thus, romantic couples were more similar in their overall drinking motives than drinking buddies whereas drinking behaviour similarity was comparable across both types of dyadic relationships. This difference may be due to length of relationship, where romantic couples had longer to witness and become similar to each other on underlying processes related to drinking (Bandura, 1977).

While Study 1 and supplemental analyses showed romantic couples and drinking buddies are concordant in their drinking motives when investigated as an overall motivational profile, Study 2 and Study 3 suggest this similarity may be specific to certain motives for each dyad. Study 2 and Study 3 included multiple APIMs, which contain

[8]One-sample t-test results for drinking behaviour: $t(173) = 23.85$, $p < .001$, 95% CI r_{pa} [.43, .51], $d = 1.81$.
[9]One-sample t-test results for drinking motives: $t(182) = 5.06$, $p < .001$, 95% CI r_{pa} [.09, .20], $d = 0.38$.
[10]Independent samples t-test for drinking motives across samples: $t(355) = 2.76$, $p < .01$, 95% CI [0.03, 0.18], $d = 0.29$.
[11]Independent samples t-test for drinking behaviour across samples: $t(355) = 1.61$, $p = 0.11$, 95% CI [-0.01, 0.10].

predictor covariances that account for the non-independence of dyadic data. These covariances represent similarity effects and, if positive, indicate dyads are more similar on variables than expected due to chance. Study 2 evidenced positive covariances for social and enhancement motives only, suggesting couples are similar on those specific motives. This finding is consistent with literature suggesting social and enhancement motives are embedded within a social context and predict alcohol use among emerging adults (Cooper et al., 2016). Study 3 evidenced positive covariances for social and coping-depression motives only, suggesting drinking buddies are similar on those specific motives. Previous research suggests best friends are similar in terms of their drinking motives (social, enhancement and generic coping motives; Hussong, 2003), and Study 3 suggests drinking buddies are likely similar in specific drinking motives as well, partially replicating Hussong's (2003) results in a different type of friendship relationship (i.e., drinking buddies versus best friends).

Previous research suggests both romantic partners (e.g., Mushquash et al., 2013) and peers (e.g., Mason et al., 2014) influence emerging adults to drink alcohol. More specifically, it appears drinking buddies confer stronger influence on drinking behaviour when compared to peers in general (Lau-Barraco & Linden, 2014). Research has established that these important relationships likely confer acceptability of drinking behaviours via transfer of alcohol expectancies (Lau-Barraco et al., 2012) as well as drinking norms (Lau-Barraco & Collins, 2011). Conversely, no researchers had investigated whether drinking motives can influence drinking behaviours among romantic partners or within drinking buddy relationships. Study 2 and Study 3 added to the drinking motives literature by demonstrating significant actor and partner effects for the influence of motives on alcohol outcomes among both couples and drinking buddies.

Specifically, in Study 2 and Study 3 enhancement and social motives were

significant predictors of actor drinking frequency during any given week (romantic couples; $B = 0.12$ and $B = 0.14$, respectively) or month (drinking buddies; $B = 0.69$ and $B = 0.82$, respectively), and when averaged across weeks (romantic couples; $B = 0.30$) or months (drinking buddies; $B = 0.92$ and $B = 0.85$, respectively), with the exception of social motives predicting drinking frequency among couples when averaged across weeks. This finding is consistent with the drinking motive literature, which suggests that social and enhancement motives are associated with drinking among emerging adults (Cooper et al., 2016). Moreover, Study 2 and Study 3 both demonstrated that romantic partners' and drinking buddies' drinking motives do impact individual alcohol use, both longitudinally and when averaged across time. Specifically, partner enhancement and social motives positively predicted individual alcohol outcomes across Study 2 and Study 3. For romantic couples, partner effects were largely related to drinking quantity (*B*s ranging from 0.29 to 0.64), whereas partner effects were largely related to drinking frequency for drinking buddies (*B*s ranging from 0.53 to 0.64). Both studies evidenced longitudinal partner effects, suggesting romantic partner and buddy enhancement and social motives predicted change in individual drinking patterns across time. This finding is consistent with individual level research suggesting social and enhancement motives predict alcohol consumption in the individual longitudinally (Grant et al., 2007; Mackinnon et al., 2014) and extends this research to suggest longitudinal dyadic influence likely occurs via positive reinforcement motives. Moreover, both Study 2 and Study 3 found the relationship between partner social motives and actor drinking frequency was mediated by change in the individual's social motives. Study 2 also found the relationship between partner enhancement motives and actor drinking quantity was mediated by change in the individual's enhancement motives. These results suggest change in individual drinking motivations may be the mechanism by which the

positive reinforcement motives of one individual influence the alcohol use of the other dyad member among both romantic couples and drinking buddies.

In Study 2 and Study 3 actor and partner coping motives were inconsistently related to actor drinking outcomes across levels of analysis. Specifically, both actor coping motives predicted actor drinking frequency and quantity when averaged across time for both Study 2 and Study 3. Moreover, partner coping-depression motives did not predict actor drinking frequency or quantity across both studies. Each study also evidenced a single partner effect for coping-anxiety motives; in Study 2, partner coping-anxiety motives predicted actor drinking quantity when averaged across time within romantic partners, whereas in Study 3 partner coping-anxiety motives predicted actor drinking frequency during any given month within drinking buddies. Coping motives are inconsistently related to alcohol use and more so related to alcohol-related problems within the literature (Cooper et al., 2016). However, both studies do suggest partner coping-anxiety motives may be more influential within emerging adult drinking relationships than partner coping-depression motives.

Finally, both Study 2 and Study 3 investigated exploratory gender/sex differences within their models, although Study 2's gender/sex examination was supplemental in nature. Study 2 included distinguishable APIM analyses, including mixed-sex couples only. These analyses were supplemental in nature for a variety of reasons; I had to exclude the same-sex couples thus making the results incomparable to the indistinguishable analyses, the coefficient standard errors were much larger in the distinguishable analyses indicating the models had less precision and more error in their estimates, and I doubled the number of statistical tests in the distinguishable model analyses, inflating the Type 1 error rate. Results were inconsistent across sex, likely due to the aforementioned analytic issues. Nonetheless, the overall pattern suggested that men influenced women's drinking quantity via the

influence of their enhancement and social motives, whereas women influenced men's drinking quantity via the influence not only of their enhancement and social motives but also of their coping-depression, and coping-anxiety motives. Overall, these exploratory analyses suggest that partner coping-anxiety and coping-depression motives may have influences on actor drinking behaviour only when the partner is a woman and the actor a man, but the above considerations suggest caution in the overinterpretation of this pattern. Study 3 investigated whether same-sex drinking buddies influenced each other more or less based on their gender/sex. Based on model fit statistics, moderation by sex did not occur. Men are thought to be more likely to have drinking buddies than women, and to confer greater influence on drinking behaviour than women given they tend to heavy drink more often (Borsari & Carey, 2003). Conversely, women are thought to drink most often in mixed-sex groups, and to drink more heavily in mixed-sex groups than in same-sex groups (Borsari & Carey, 2003; Thrul et al., 2017). Results from Study 3 suggested women do seek out same-sex drinking partnerships, and that there was no difference in the magnitude of influence among female versus male drinking buddy dyads. Thus, young women likely engage in partnerships focused on drinking and influence each other to a similar magnitude as male drinking buddies.

Discrepancies Between Studies

Across studies, my dissertation's findings were largely consistent. My theoretical predictions, which emerged from Grant et al.'s (2007) expanded five-factor version of Cooper's (1994) original model of drinking motivations, as well as from social learning theory (Bandura, 1971), were largely supported. However, there were some inconsistencies across studies that bear mentioning.

The first discrepancy pertains to the support for SLT predictions across studies.

While there was some support for SLT predictions in Study 1 and in the supplemental similarity analyses completed with the drinking buddies data, Study 2 and Study 3 evidenced stronger support of socialization within both dyadic relationships. For example, in Study 1 and in the supplemental analyses drinking behaviour similarity and drinking motive similarity were not significantly correlated with each other in either romantic couples or drinking buddies. Moreover, drinking motive similarity among couples was correlated with face-to-face contact and days spent drinking together, but not with cohabitation status or relationship length, and drinking motive similarity was not correlated with any SLT predictor; in drinking buddies, both similarity profiles were not correlated with any SLT predictor. These findings contradict results from Study 2 and Study 3 where drinking motives predicted drinking behaviour over time in both dyadic couples, suggesting a socialization process occurred. As discussed previously, because Study 1 and the supplemental analyses utilized overall drinking and motives similarity profiles, individual motive/drinking behaviour influence was unable to be evaluated. Study 2 and Study 3 were arguably much stronger tests of SLT given they incorporated longitudinal data (Reifman et al., 2006); thus, a stronger weight should be placed on the results of Studies 2 and 3 in determining overall support for SLT predictions.

The second discrepancy pertains to similarity in specific drinking motivations in Study 2 and Study 3. When examining the APIM predictor covariances in Study 2, romantic couples were similar in their social and enhancement motives. Conversely, when examining the APIM predictor covariances in Study 3, drinking buddies were similar in their social and coping-depression motives. Moreover, similarity coefficients were stronger among romantic couples (*B*s ranging from 0.05 to 0.29) than among drinking buddies (*B*s ranging from 0.05 to 0.06). These discrepancies may have been due to differing time lags between

measurements (i.e., 4 weeks versus 4 months), length of relationship (average of 2.2 years versus 4.1 months) and/or differences across romantic relationships versus friendships, respectively. For example, romantic couples may have had more time to influence each other given they were together for longer, allowing for more observation of motives and thus increased similarity (Bandura, 1977; Bove et al., 2003). Close friends have been shown to be similar in levels of depression (Hogue & Steinberg, 1995), so characteristics of drinking buddy relationships may explain the similarity found in coping-depression motives. Given drinking motive similarity had not been previously studied in romantic couples or drinking buddies, further research is needed to determine whether individual motives operate differentially in these two types of dyadic pairings.

The third discrepancy pertains to the actor effects found in Study 2 and Study 3. While most actor effects were consistent between the two studies, there were a few differences. Namely, Study 3 evidenced significant coping-anxiety and coping-depression actor effects when predicting alcohol frequency and quantity at the within-subjects level whereas Study 2 did not. Moreover, Study 3 found a significant actor effect for coping-depression motives predicting actor drinking frequency at the between-subjects level whereas Study 2 did not. Overall, coping motives are less predictive of alcohol use in the individual than are enhancement motives (Cooper et al., 2016). When measured over time, it appears coping motives are also related more so to alcohol-related problems (Littlefield et al., 2010) than to alcohol use, although longitudinal research examining coping-anxiety and coping-depression motives separately is rare (Cooper et al., 2016; Kuntsche et al., 2005). In addition to the coping motives, Study 3 also found two additional actor effects that Study 2 did not: social motives predicted actor drinking frequency at the within-subjects level and conformity motives predicted actor drinking quantity at the within-subjects level. When

measured longitudinally, prior research suggests that social motives predict drinking behaviour in adults and adolescents, whereas conformity motives do not (Bradizza et al., 1999; Cooper et al., 2016; Crutzen et al., 2013). Perhaps because conformity motives are most relevant to adolescents/emerging adults (Cooper, 1994), and because the drinking buddy sample consisted of individuals who drank often with peers (allowing for multiple opportunities for peer pressure to occur), conformity motives were related to drinking. Overall, because coping motive results are inconsistent predictors of alcohol use outcomes across prior studies and across Study 2 and Study 3 of the present thesis, dyadic coping-anxiety and coping-depression motives likely need to be investigated further.

The final discrepancy pertains to the partner effects found in Study 2 and Study 3. While most partner effects were consistent, especially for positive reinforcement motives (enhancement and social), there were some discrepancies. Overall, in Study 2 romantic partner positive reinforcement motives were more predictive of increased actor drinking quantity than frequency, whereas in Study 3 drinking buddy positive reinforcement motives were more predictive of actor drinking frequency than quantity. Moreover, partner effects found in Study 2 were consistent across levels of analysis (between- and within-subjects), whereas Study 3's partner effects were mostly at the within-subjects level (i.e., only drinking buddy enhancement motives predicted actor drinking quantity at the between-subjects level). As noted in the discussion of Study 3 (Chapter 4), this may be due to design differences and/or differences across relationships. Romantic partners may be more likely to drink with each other than with others, thus influencing quantity more so than frequency. Conversely, drinking buddies may be more likely to encourage frequent group drinking thereby influencing frequency of drinking more so than drinking quantity. Moreover, Study 2 may have evidenced more within-subjects effects given the longer timeframe measured as well as

the shorter relationship length. Perhaps influence is more likely to occur over 4 months than 4 weeks, especially within relatively new relationships (Patrick et al., 2016).

The four discrepancies discussed above are relatively minor. For the first, while there was not universal support for SLT predictions across all studies, Study 2 and Study 3 evidenced strong support for social learning processes given drinking motives influenced drinking behaviour longitudinally in both dyadic relationships. For the second, all three studies support similarity of drinking motivations among romantic couples and drinking buddies, and both dyads were similar in their overall drinking behaviour profiles. Future research is needed to understand more clearly whether similarity is motive specific among these dyads. The third and fourth discrepancies pertain to differential influence of motives on drinking behaviour. Hypothesized drinking motives (i.e., positive reinforcement motives) were largely predictive of both actor and partner drinking in both studies, and differences that did emerge were likely due to design discrepancies (i.e., time lags and relationship length). However, differences could also be due to inherent differences found within romantic and drinking buddy relationships. Given my dissertation was the first to examine drinking motives within these important emerging adult relationships, additional research is needed to further explore the differences inherent among these dyadic pairings. Overall, my dissertation has found consistent support of social influence related to drinking motives among both romantic couples and drinking buddy relationships.

Theoretical Implications

Within interpersonal relationships, social influence on drinking behaviour occurs via many different avenues, such as through social cohesion and bonding (Dietrich et al., 2012; Douglas, 1987), socialization (Bandura, 1977), and through learning of social norms and expectancies (Borsari & Carey, 2001; Lau-Barraco et al., 2012). Drinking motives theory

(Cooper, 1994) provides a theoretical basis for understanding individual alcohol use. My dissertation expands drinking motive theory into the social context of emerging adulthood. My dissertation's contribution to drinking motives theory, as well as implications for other important social influence theories, is discussed below.

Drinking Motives Theory

As outlined in Chapter 1, drinking motives theory suggests individuals drink alcohol to achieve certain desired outcomes from their drinking (Cooper, 1994; Cox & Klinger, 1988). Expectations related to the outcomes of drinking provide a decisional framework for consumption. Each motive is associated with unique patterns of alcohol outcomes within individuals: enhancement motives are associated with heavy drinking, social motives are associated with overall drinking behaviour, and coping-anxiety, coping-depression and conformity motives are associated with alcohol-related problems as opposed to alcohol use (see Cooper et al., 2016). Drinking motives have not been investigated thoroughly within a social context or within dyads, although two motives are directly related to drinking within the social environment (i.e., social and conformity motives). Limited past research has shown drinking motives in adolescents are positively predicted by the drinking motives of classmates (Kuntsche & Stewart, 2009). Moreover, drinking motives of an adolescent peer group confer influence on an individual adolescent's drinking behaviour by impacting the adolescent's own drinking motives (Stewart et al., 2014). Finally, emerging adult friends are influenced to drink not only by their own motives, but by the motives of their best friend (Hussong, 2003). My dissertation's findings advance this literature by investigating drinking motives within romantic couples and drinking buddies, two of the most influential relationships among emerging adults when it comes to alcohol consumption (Borsari & Carey, 2003; Steinberg & Monahan, 2007). Across studies, romantic couples and drinking

buddies were similar in their drinking motivational profiles. Within couples, drinking motives may be a part of the drinking partnership (Homish & Leonard, 2007), where matching on drinking motives increases relationship satisfaction in couples in a similar way matching on alcohol use does. In fact, there is data to suggest that this is the case. Stewart et al. (2019) found that husband's relationship satisfaction is negatively impacted by discrepant levels of negative reinforcement drinking within the couple; relationship satisfaction was highest when both members of the couple drank for negative reinforcement reasons. Among drinking buddies, similarity may be related to cohesion and bonding (as discussed below) and represent another factor by which friendships are started, maintained, or strengthened (Martin & Hoffman, 1993).

Previous research had shown that both romantic partners and drinking buddies influence each other to drink over time via overt drinking behaviours (Lau-Barraco et al., 2012; Mushquash et al., 2013). My dissertation was the first to investigate whether drinking motives conferred similar influence on drinking behaviour within these important social relationships. In both Study 2 and Study 3, romantic partners and drinking buddies influenced each other to drink over time via their drinking motivations (i.e., enhancement, social and coping-anxiety). Thus, both Study 2 and Study 3 advanced the drinking motives literature by showing that drinking motives confer influence on drinking behaviours longitudinally within these important emerging adult relationships. Social motives, and enhancement motives to some extent, are connected to the social environment alcohol use commonly occurs in (Cooper, 1994; Cooper et al., 1992). My dissertation findings extend this theoretical concept into dyadic pairs, suggesting that underlying motives that often result in drinking with others also, in turn, influence the behaviour of individuals within that social environment. Coping-anxiety motives also conferred influence among both dyadic pairings.

This finding may be due to the observability of anxiety (discussed below), and/or because of messages from the broader culture related to drinking for anxiety reduction (discussed below). Indeed, our lack of partner effects for coping-depression motives fits with research suggesting drinking to cope with depressed affect is more so associated with drinking alone than with others (Cooper, 1994; Kuntsche & Cooper, 2010). Indeed, emerging adults who report depressive symptoms are more likely to drink alone and in turn experience alcohol-related problems (Keough et al., 2015). Thus, social influence is less likely to occur for coping with depression drinking motives given the relative lack of opportunity for direct observation by romantic partners or drinking buddies (see SLT discussion below).

In sum, my dissertation suggests that among romantic couples and drinking buddies, positive reinforcement motivations and coping-anxiety motives of partners confer risk of actors' increased alcohol use over time within emerging adults. Moreover, members of romantic couples and drinking buddy dyads are similar to one another in terms of their drinking motives. These findings add to the drinking motives literature by focusing on the social context in which motives operate as opposed to only their individual determinants (such as personality traits; Mackinnon et al., 2014). Moreover, a substantial body of literature has shown that drinking motives predict alcohol use among individuals (Cooper et al., 2016). The results from my dissertation broaden the implications of drinking motives theory to the social environment of young people. Thus, drinking motives confer risk of alcohol use not only those who directly endorse them, but for those who find themselves drinking with such individuals, particularly those in close relationships with such individuals. In the following sections, I discuss how my findings fit within SLT as well as the broader sociocultural context in which emerging adults drink.

Social Learning Theory

As outlined in Chapter 1, SLT suggests that individual behaviour is shaped by observation of models within the environment (Bandura, 1971). Individuals do not have to directly experience the consequences of certain behaviours to learn their likely consequences; via vicarious reinforcement, individuals adopt behaviours they perceive to be reinforced in others. Modeling is a proximal determinant of drinking among emerging adults (Maisto et al., 1999). My dissertation was the first to investigate potential socialization via drinking motives among romantic couples and drinking buddies. Both Study 2 and Study 3 showed that drinking motives influenced drinking behaviours over time, consistent with a socialization process (Sher, 2016). Longitudinal research allows for more inferences to be made related to socialization versus selection, although it is likely both processes operate reciprocally when predicting emerging adult drinking (Patrick et al., 2016). The results from my dissertation could not fully disentangle selection from socialization (see Strengths and Limitations below), as similarity in motives found across studies may have been due to selection, socialization, or both. However, the within-subjects effects found in Study 2 and Study 3 provide evidence that socialization likely occurred over the weeks and months of each study.

As noted previously, positive reinforcement motives (social and enhancement) and coping-anxiety consistently predicted drinking behaviours in romantic partners and drinking buddies. Social motives are external to the individual and involve drinking to increase social affiliation (Cooper, 1994). Thus, these motives are likely observable to others as they occur within the social environment (Cooper et al., 2016), thus allowing social influence to occur (Bandura, 1977). Conversely, enhancement and coping-anxiety motives are both located internally, meaning individuals are attempting to improve their internal states when drinking for those reasons (Cooper, 1994). It may seem counterintuitive, then, that romantic partners

and drinking buddies are influenced by such motives in their friends/partners as they are presumably less observable than social motives. However, both coping and enhancement motives have been shown to transfer between peers in adolescence (Stewart et al., 2014), suggesting internal motives are likely observable. Moreover, social relationships are one of the most powerful sources of reward (Reis et al., 2000), and enhancement motivated drinkers likely seek to enhance their emotional experience via social drinking (Cooper et al., 2016). Moreover, enhancement motives are associated with drinking in social settings, such as in bars and with same-sex friends (Cooper, 1994; Kuntsche & Cooper, 2010). Thus, it is likely that enhancement motives are visible to individuals in the social environment, although future research will need to confirm this directly (see Directions for Future Research below). In terms of the visibility of coping-anxiety motives, and anxiety more generally, researchers suggest that during social interactions, college peers are accurate in their identification of anxiety in each other, and that these scores correlate with individual ratings of their own subjective anxiety (Creed & Funder, 1998). Given anxiety is observable to others, drinking to cope with anxiety is likely also visible as the individual is attempting to reduce their anxiety via drinking in the moment. Moreover, romantic partners who are experiencing negative affect are likely to express this to their partner, as well as express self-derogatory statements (Rehman et al., 2008). In line with SLT, individuals may express a desire to reduce their anxiety via drinking when with others, and/or drink to reduce observable signs of anxiety in the presence of others, thus influencing individuals in their environment to drink.

Alcohol expectancies are often compared to drinking motives given both focus on the potential consequences of alcohol use (Baer, 2002; Cooper, 1994). The key difference between the two is that drinking motives directly measure alcohol use aimed at a certain

outcome whereas expectancies refer to beliefs related to drinking which may not result in drinking behaviour (Patrick et al., 2016). Expectancies have been studied within a social context and positive expectancies seem to mediate the relationship between romantic partner and drinking buddy influence and alcohol use (Lau-Barraco et al., 2012; Leonard & Homish, 2008). My dissertation suggests drinking motives may also underlie the influence of romantic partners and drinking buddies on alcohol use and operate in a similar fashion to positive alcohol expectancies. Specifically, the social motives of drinking buddies and romantic partners influenced the actor's social motives, which in turn influenced the actor's alcohol use. This finding is intuitive given social motives are external and occur exclusively within a social context (Cooper, 1994). Given change in drinking motives did not mediate every partner effect found in Study 2 and Study 3, drinking motives likely exert their influence through other mechanisms as well. For example, perhaps witnessing a partner or drinking buddy drink because of a specific motivation increases the normative perception of alcohol use for that reason, which in turn results in increased alcohol use (Neighbors et al., 2008). Additional research is needed to tease apart other important mechanisms that may exist to explain partner motive influences on actor drinking behaviour. Regardless, there remains a significant direct relationship between the motives of a close other and drinking within individual emerging adults.

In summary, my dissertation provides evidence that drinking motives confer influence on drinking behaviours among emerging adult relationships. Results across studies suggest drinking buddies and romantic partners are concordant in their reasons for drinking, and Study 2 and Study 3 both suggest that along with overt drinking behaviours, close others' reasons underlying alcohol use can increase individual drinking behaviours. Thus, drinking motives are likely modeled between peers and romantic partners, consistent with

SLT predictions (Bandura, 1971).

Social Cohesion, Bonding, and Sociocultural Influence

While SLT suggests how alcohol use behaviours are learned from others, social cohesion and bonding theories suggest that alcohol use has likely persisted for thousands of years due to its facilitation of bonding across cultures (Brown & Gregg, 2012; Wilson, 2005). Alcohol use is viewed as a social activity by emerging adults (Zimmerman & Sieverding, 2011) and is believed to facilitate social interactions (Christiansen et al., 2002). Research suggests that in addition to the more hedonic effects of alcohol use, drinking with others may offer social benefits such as feeling more connected to one's community (Dunbar & Shultz, 2010). Indeed, individuals who report having a local bar they attend regularly indicate feeling more trusting of their community, feel more socially engaged, and have larger social networks than those who do not (Dunbar et al., 2017). Given social cohesion and bonding follows drinking, perhaps a desire to bond and feel connected prompts drinking with romantic partners and drinking buddies, and drinking motives are what is learned during these drinking occasions. Social motives may be especially related to social cohesion and bonding given they are the most endorsed drinking motive across cultures (Kuntsche et al., 2005; Mackinnon et al., 2017a). The predictor covariances from Study 2 and Study 3 showed that romantic couples and drinking buddies were found to be similar in their social motives. Thus, from a bonding perspective, dyads are likely motivated to socially drink in order to enhance their relationship. Moreover, Study 2 and Study 3 both evidenced partner effects for positive reinforcement motives, which are linked to drinking in convivial social contexts (Cooper, 1994; Cooper et al., 2016). Indeed, social motives are endorsed by individuals who wish to increase their social affiliation, and enhancement motivated drinkers seek to enhance their emotional experience (Cooper et al., 1995). Thus, witnessing your

romantic partner or drinking buddy drink for positive reinforcement may result in increased feelings of cohesion and bonding, leading to drinking influence (i.e., an indirect effect of partner motives on own behaviour through cohesion and social bonding).

Within the sociocultural environment, media plays a role in suggesting what is normative behaviour (Collins et al., 2003), including alcohol use (Noguti & Russell, 2014). Indeed, media influence is often interpreted through a SLT framework, where figures in the media are the "models" individuals learn normative behaviours from through vicarious reinforcement (Bandura, 1971; Engels et al., 2009). Young people who consume more marketing and television that depict alcohol use increase their drinking (Dal Cin et al., 2009; Engels et al., 2009). Moreover, representing alcohol use in specific ways reinforces alcohol-related norms and values (Perkins, 2003). Research shows that alcohol is depicted on television as having minimal negative effects (Hansen, 2003; Van den Bulck et al., 2008). Alcohol use is most predominantly portrayed as a social activity on television; however, drinking is also referenced as a way to cope with personal crises, as a way to forget about worries, and as a way to relax (Atkinson et al., 2011). As such, the negative consequences of drinking to cope with negative emotions are minimized, and beliefs related to alcohol's positive effects on mood are reinforced. Moreover, alcohol use is mentioned frequently in popular music, where positive consequences such as increased social affiliation and improved emotional functioning are described in lyrics more frequently than negative consequences (Primack et al., 2008). Thus, young people are predominantly exposed to models in the media that promote alcohol use as a means for improving mood and increasing social facilitation. Perhaps media in all its different forms primes individuals to hold positive beliefs related to alcohol use, which are then demonstrated by individuals in their immediate social environment. For example, an emerging adult is repeatedly exposed to television

content that suggests alcohol use causes relaxation and a reduction in anxiety. They then witness their drinking buddy or romantic partner drinking to cope with their anxiety which reinforces messages received on television, thus causing the individual to drink. In this way, drinking motives demonstrated by others in the environment may reinforces messages received from music, television, and marketing, allowing for influence on drinking behaviour to occur within social settings.

In summary, results from my dissertation may be viewed from a sociocultural and social cohesion perspective, where desire to bond via alcohol use brings emerging adults together (Christiansen et al., 2002). Once together, opportunity to witness the drinking motives of close others occurs, which reinforces normative perceptions that are commonly presented through media, such as alcohol's ability to reduce negative affect and increase social affiliation (Atkinson et al., 2011; Primack et al., 2008).

Clinical Implications

My dissertation has several important clinical implications. Future intervention efforts may wish to specifically target romantic couples and drinking buddies on their reasons for drinking. To the extent that motives similarity across all studies was the result of socialization effects, such effects could result in escalations in risky drinking behaviours and reasons for drinking among emerging adults. Moreover, both romantic partners and drinking buddies were shown to influence each other to drink over time via their drinking motivations. This finding suggests that drinking motives may be important targets in behavioural couples therapy (BCT; Powers et al., 2008), as well as in Network Therapy (NT; Galanter, 1993), to prevent escalations in drinking over time. Finally, prevention efforts may wish to target emerging adults on their reasons for drinking and provide education on the effect their close relationships may be having on their drinking behaviours.

Given personality traits are associated with specific motives for substance use (Cooper et al., 1995) and patterns of coping (Connor-Smith & Flachsbart, 2007), personality-matched interventions have been developed to reduce risky alcohol use. Specifically, anxiety sensitivity (i.e., the fear of anxiety-related sensations), hopelessness (i.e., low expectation of desirable events and a high expectation of aversive events), sensation seeking (i.e., the need for stimulation), and impulsivity (i.e., deficits in behavioural inhibition) are four traits consistently associated with vulnerability to addiction (Castellanos-Ryan & Conrod, 2012; Pihl & Peterson, 1995). Indeed, personality-matched interventions for these specific traits effectively reduce alcohol misuse among adolescents (Castellanos & Conrod, 2006; O'Leary et al., 2016) and emerging adults (Watt et al., 2006). Given personality traits contribute to the motivation of behaviour in general, researchers have shown that drinking motives mediate the relationship between personality and substance use (Cooper et al., 1995; Stewart & Devine, 2000). That is, drinking motives act as a proximal influence on substance use through which other more distal factors, such as personality, are mediated (Cooper et al., 1995; Maisto et al., 1999). For example, high sensation seeking and low-inhibitory control are related to enhancement motives (Kuntsche et al., 2006), whereas high anxiety sensitivity is related to coping-anxiety motives (Chandley et al., 2014), and high hopelessness is related to coping-depression motives (Mackinnon et al., 2014). Given personality traits are related to specific motives for drinking, researchers have investigated whether risky motives for drinking are reduced as a result of personality-targeted interventions for alcohol misuse. Without intervention, reductions in neuroticism and impulsivity correspond to reductions in coping and enhancement motives (Littlefield et al., 2010). Moreover, reductions in coping and enhancement motives mediated the relationship between personality change and reductions in problem drinking. Conrod et al. (2011) investigated whether a personality-

matched intervention reduced risky drinking motives (coping and enhancement) in a theoretically consistent way among adolescents. Results indicated that the intervention globally reduced coping motives, and that this effect was largely driven by the high anxiety sensitivity group. Moreover, enhancement motives were also reduced via the intervention, with sensation seekers particularly reporting this reduction. Through this intervention, alcohol use, binge drinking, and alcohol-related problems were also reduced. Watt et al. (2006) examined a brief cognitive-behavioural therapy (CBT) intervention for high anxiety sensitive young adult women with dysfunctional drinking patterns. Along with a reduction in hazardous alcohol use, participants in the intervention group saw a reduction in their conformity motives. Thus, evidence suggests that drinking motives can be targeted within an individual therapy setting. This type of matched intervention might be usefully adapted for use with couples and drinking buddies in order to understand and address factors which may serve to reinforce and maintain their risky drinking patterns. Extending this further, developing a drinking motives-specific intervention may be additionally beneficial given motivations are thought to be more malleable and suitable for intervention than personality traits which are often difficult to modify (Oei, & Morawska, 2004). Indeed, Cox and Klinger (2004) suggested that we must first understand the specific motivation for drinking to encourage people to reduce their drinking. Thus, interventions aimed at reducing stress may be particularly beneficial for those who drink to cope (Cooper et al., 1995). Moreover, altering expectancies with respect to the enhancing effects of alcohol might be especially appropriate for those who score high on enhancement motives.

My dissertation has implications for BCT and NT as well. BCT views substance abuse and relationship functioning as reciprocal (Powers et al., 2008). From this lens, substance misuse has a deteriorating effect on relationship functioning, and the relationship

itself can cue and reinforce the substance use issue (Epstein & McCrady, 1998). BCT focuses on behavioural self-control and learning new coping skills, but also on improving partners' coping with drinking-related situations and relationship functioning in general. BCT has been shown to improve relationship functioning and to produce greater abstinence from alcohol than typical individual-based treatment (O'Farrell & Clements, 2012; Powers et al., 2008). In terms of broader social influence, NT is an integrated approach to substance misuse that involves family and friends in the treatment (Galanter, 1993, 2015). Once the network is identified, their task is to help sustain the patient's abstinence, as directed by the therapist. My dissertation, along with other studies (e.g., Lau-Barraco & Linden, 2014), suggests that drinking buddies may be especially important members of the network when it comes to emerging adult drinking behaviour. Thus, it is recommended that they be involved in the treatment of an emerging adult engaging in NT. Moreover, results from my dissertation suggest that within BCT and NT, it is important to assess not only the overt drinking behaviour of romantic partners and drinking buddies, but also what motivates them to drink. Without addressing motives within the dyads, social influence will continue and undermine attempts at change within treatment. Results from Study 2 and 3 further suggest that it may be important to specifically target enhancement, social, and coping-anxiety motives within treatment given they were the motives that most strongly predicted drinking within dyads over time. After establishing which personal and partner/buddy motives are likely underlying the emerging adult's drinking behaviour, therapists could target those motives with alternative activities or coping skills that could be utilized within the individual as well as within the dyad (Galanter, 2015; Powers et al., 2008). Couples and drinking buddies may benefit from developing alternative activities that they could do together instead of drinking, particularly if those activities have the added benefit of addressing their

underlying motives for drinking. For example, taking up a stimulating hobby such as running together may address the shared need for enhancement, or practicing yoga and meditation together may help them cope with their anxiety.

Finally, results from my dissertation suggest prevention efforts might be successful if they target specific groups on their reasons for drinking. Given the high rates of alcohol use among emerging adults, mass media has become an important aid in targeting this high-risk population (DeJong, 2002). Most media campaigns that focus on emerging adult drinking are campus based and utilize flyers, social media, and advertisements to convey their information (Borsari et al., 2007). Messages surrounding the importance of reducing binge drinking aimed at emerging adults are often undifferentiated and broad (DeJong, 2002). Moreover, prevention efforts often focus on demographic or personality factors that are difficult to change (Oei & Morawska, 2004). Thus, prevention experts have begun focusing on campus-based media campaigns that correct students' misperceptions about their peers' alcohol consumption (Perkins, 2003). By providing accurate information on student drinking, normative perceptions of drinking are lowered (Perkins, 2002) and more accurate perceptions of campus norms are achieved. This approach has been shown to be effective in reducing actual drinking behaviour on campus (DeJong, 2002; Perkins & Craig, 2006). Similar campaigns could be developed around drinking motives, where emerging adults are educated on the impact certain motives (their own and their close others') may be having on their drinking behaviour. For example, campaigns could provide education on enhancement motivated drinking, the risks related to drinking for such reasons (i.e., risky, heavy alcohol consumption; Cooper et al., 2016) and provide suggestions for alternative activities individuals could engage in to address their need for enhancement. My dissertation further suggests campaigns may be more effective if they focus on the influence close others have

on drinking behaviour. For example, campaigns could educate emerging adults on the impact romantic partners and drinking buddies may have on their drinking over time. Similar to techniques utilized in BCT and NT, alternative dyadic activities could be suggested via campaigns that target underlying drinking motivations.

In summary, similar to personality-matched interventions (e.g., Conrod et al., 2000a; Conrod et al., 2000b), the results from my dissertation suggest a drinking motives-matched intervention may be useful for emerging adults who are struggling with drinking. Motives are malleable when targeted indirectly via intervention, and when reduced result in reductions in drinking behaviour (Conrod et al., 2011; Watt et al., 2006). Thus, directly targeting emerging adults on their reasons for drinking should be successful at reducing drinking behaviour as well. Moreover, given romantic partners and drinking buddies confer influence via their drinking motives, my dissertation suggests a drinking motives intervention might be adapted for use within BCT and NT. Here, not only individual drinking motives are targeted, but the drinking motives of important social contacts could be targeted as well. By targeting both individual and dyadic reasons for drinking, emerging adults would be encouraged to find other ways to reduce negative affect and increase social affiliation both on their own and when with individuals in their social network. Finally, educational campaigns aimed at reducing emerging adult drinking might focus on drinking motives, while also emphasizing the role close others play when it comes to their drinking behaviour.

Strengths and Limitations

My dissertation has several strengths worth noting. Its greatest strength is its rigorous longitudinal design, coupled with strong statistical methodology. By utilizing multilevel models, stronger inferences could be made in relation to influence occurring over time.

Moreover, APIMs allowed for tests of direct influence among dyads and removed the challenges of analyzing non-independent data. Another overall strength is my investigation of both romantic partners (including same-sex and mixed-sex partners) and drinking buddies, two of the most important relationships within emerging adulthood (Gilmartin, 2005; Lau-Barraco & Linden, 2014), and more specific than general tests of peer influence (e.g., Hussong, 2003). Another strength of my dissertation is the relatively large sample sizes utilized across studies which allowed for powerful tests of my hypothesized models. Finally, my findings were largely consistent across studies, despite different time lags and relationships investigated. This consistency across studies attests to the robustness of my findings.

Despite these strengths, my dissertation was limited in several ways. First, although the data contained in Study 1 was longitudinal, it was analyzed cross-sectionally. While I improved on typical cross-sectional designs by using repeated measures to reduce measurement error, I was precluded from investigating change in similarity across time. Moreover, Study 1 utilized a coefficient of profile agreement (r_{pa}; McCrae, 2008), which is not as strong as other measures of similarity among dyads, such as response surface analysis (RSA; Edwards, 1993; Shanock et al., 2010). RSA utilizes ratings from both members of the dyad as separate predictors while assessing the effect of congruence. As a result, RSA allows for assessment of three distinct concepts: agreement, disagreement, and the direction of discrepancy if there is disagreement. Researchers can then use these scores as outcome predictors (e.g., is agreement on drinking motives associated with increased drinking behaviour?). Investigating drinking motives and drinking behaviour similarity via RSA would allow for tests of individual motive similarity, as well as what this similarity may predict longitudinally.

Second, my dissertation was unable to definitively differentiate between selection and socialization. In order to differentiate between these often co-occurring concepts, researchers should recruit individuals into longitudinal studies before they enter into important relationships. Recruitment could occur prior to major life transitions, such as graduating high school, where individuals are more likely to begin forming new social networks and relationships (Martin & Hoffman, 1993). At baseline, drinking behaviours and drinking motives should be measured. Then, once individuals enter relationships, baseline information could be used to determine whether the individual selected their relationships based on their own levels of drinking/drinking motives (Reifman et al., 2006). This type of investigation could show, for example, that heavy drinking/high scores on specific drinking motives by respondents preceded their association with a heavy drinking/high motive drinking buddy or partner at a later wave. After determining whether selection occurred, relationships could then be followed over time to assess whether socialization occurs. Past research has investigated selection and socialization among peers by assessing relationships that developed at a later wave, thus determining whether individual's selected their friends or partners based on their drinking levels at a previous wave (e.g., Leonard & Mudar, 2003; Wills & Cleary, 1999). The design of my dissertation precluded this type of analysis given drinking buddies and romantic partners were in relationships prior to enrolling in my studies. My models should therefore be replicated with a longitudinal design that allows for differentiation between selection and socialization (see Directions for Future Research below).

Third, Study 2 and Study 3 were unable to demonstrate temporal precedence, one of the criteria for establishing a causal relationship (Shadish et al., 2002). Multilevel models utilized in both studies did not control for baseline variables as, for example, a cross-lagged

panel model does. Instead, the models partitioned the variance into between and within-subjects components. In this framework, the between-subjects level represented the portion of the variance that did not change over the 4-weeks/months of each study (i.e., the trait-like variance that remained constant over 4 weeks/months). The within-subjects level represented change within any given week/month (i.e., state-like variance that fluctuated over the 4 weeks/months). Stated more simply, as one variable increased over time (e.g., enhancement motives), the other variable (e.g., drinking quantity) also changed over time in the same direction during any week/month of each study. Thus, while multilevel models do not establish temporal precedence, the within-subjects component of each model tested hypotheses that could not be examined with cross-sectional data because they modeled change over time. Moreover, multilevel models allow for highly complex structural models to be estimated (such as APIMs) and are an improvement over cross-sectional approaches because data from all time points are utilized.

Fourth, differing time lags between Study 2 and Study 3 reduced the comparability of results. As such, differences found among Study 2 and Study 3 may be due to differences in time lag as opposed to inherent differences among drinking buddy and romantic couple relationships. Thus, my studies should be replicated in both these important emerging adult relationships using the same longitudinal timeframe. Utilizing the same timeframe would allow for direct comparisons to be made, including the magnitude of influence each of these relationships confers on drinking behaviour (see Directions for Future Research below). Moreover, while the weekly and monthly time lags in my studies are consistent with prior work (Bartel et al., 2017; Hussong, 2003; Mushquash et al., 2013), they are ultimately arbitrary. Conclusions, therefore, may not generalize to other time lags. Results from my dissertation should be replicated using longer or shorter time lags to determine whether

influence from drinking motives occurs over long-term relationships, or whether it is confined to shorter time periods.

Fifth, the demographics contained within my dissertation limit the generalizability of findings. Samples across studies were largely homogenous in terms of ethnicity, and socioeconomic status. Moreover, while emerging adults are an at-risk group for hazardous alcohol use and alcohol-related problems, they are a specific developmental stage (ACHA, 2016; Park et al., 2006). Thus, results may not generalize to older adults or to adolescents. Investigating drinking motives within these additional age ranges might allow for stronger conclusions to be made around the influence of motives with social contexts. Across all studies, sex was assessed as binary (i.e., male or female). Thus, results may not generalize to other sex and gender identities (e.g., transgender or non-binary individuals). Moreover, while Study 1 and Study 2 did not exclude same-sex couples from participating, there were relatively few couples recruited overall (i.e., 8% of the sample). Couples who identify as LGBTQ+ (lesbian, gay, bisexual, transgender, queer, etc.) are often excluded from research, and when included are usually restricted to gay and lesbian couples (van Eeden-Moorefield et al., 2018). Thus, results from Study 2 should be replicated in different types of mixed-sex relationships (e.g., non-binary or transgender relationships), as well as in same-sex couples. Similarly, Study 3's sample was comprised of same-sex drinking buddies. Recruiting same-sex drinking buddies precluded analyzing the data using distinguishable APIMs (i.e., do female drinking buddies influence male drinking buddies to a greater extent, or vice versa?); however, sex differences among same-sex drinking buddies were assessed via moderation analyses. Mixed-sex drinking buddies may influence each other to differing degrees than same-sex drinking buddies (e.g., drinking with mixed-gender groups is associated with weekend drinking among emerging adults; Thrul et al., 2017). Conversely, perceived

drinking norms of same-sex peers influenced the drinking behaviour of college students more so than the perceived drinking norms of mixed-sex peers (Lewis & Neighbors, 2004). Thus, my drinking motive results should be replicated in mixed-sex (and other gender presentations) drinking buddies to evaluate the strength of social influence among different gendered peers.

Finally, all measures in all studies were self-report. I relied on emerging adults' perceptions of their own drinking motives and alcohol use. The Modified DMQ-Revised (Grant et al., 2007) and the Timeline Follow-Back Questionnaire (Collins et al., 2008) have good psychometric properties. However, relying on retrospective self-report to assess motives and alcohol use assumes that respondents are aware of the motives that underlie their behaviour. Previous studies have shown that self-reported and observed acts are often mismatched (Gosling et al., 1998). Motives can also be measured by using ecological momentary assessment (i.e., where individuals are repeatedly sampled on their motives/drinking behaviour throughout their daily lives; Shiffman, 2009) or by observing young people drinking in actual situations and inferring their motivations for use. Self-report of alcohol use is also prone to social desirability, where participants alter their responses to be viewed more favourably. Validated questionnaires should be used to measure socially desirable responding among participants (van de Mortel, 2008). Moreover, Brener et al. (2003) recommend asking questions more than once, using biochemical validation measures, or including questions asking about the use of fictitious drugs to remove those who are "faking bad". Thus, my studies should be replicated using some of these objective strategies to reduce bias and increase reliability.

Directions for Future Research

In addition to the ideas discussed in each manuscript and throughout this chapter,

future research could expand on my dissertation findings in the following ways. First, to make more direct comparisons, drinking buddies and romantic couples might be studied over the same longitudinal timeframe. Such a design would allow for a more direct comparison of results and allow for the magnitude of partner influence in each relationship to be compared. Moreover, models could be extended to the broader drinking network, and include other important relationships in emerging adult lives. For example, Bartel et al. (2020) included friends, romantic partners, siblings, and parents in their investigation of social networks and drinking behaviour influence; binge drinking of romantic partners but not peers were predictive of individual binge drinking. However, their models did not include drinking motives or drinking buddies. Future research could recruit broader social networks of emerging adults, and include drinking motives as well, to investigate the magnitude of influence of each member of the network.

Second, disentangling selection from socialization might be an important next step in the drinking motives social influence literature. Given the designs of both Study 2 and Study 3, it is unclear if couples and drinking buddies influenced one another over time or if they selected each other based on similar drinking behaviours and motives (although within-subjects effects suggest socialization likely occurred). Future studies might recruit emerging adults prior to entering university, and then follow them as they transition into a new school environment where new relationships are likely to form (Martin & Hoffman, 1993). By investigating baseline alcohol use and drinking motives, stronger conclusions could be drawn in regard to whether emerging adults select drinking buddies and romantic partners on the basis of their drinking motives, and then whether the drinking motives of others influence them to drink over time.

Third, investigating the observability of drinking motives is an important next step

for future studies examining the mechanisms underlying social influence. Indirect evidence suggests motives are likely visible to others (Stewart et al., 2014), but additional research is needed to confirm the observability of various drinking motives. Informant reports might be utilized to determine whether others can accurately report the motives of an individual known to them. If congruence is found among individual motive ratings and their informant, this would provide evidence that motives are observable to others in the social environment. Moreover, experimental designs might investigate whether individuals can accurately report the motives of a confederate within a simulated bar environment. For example, confederates could be assigned a specific motive to convey via verbal and non-verbal communication (i.e., by directly referencing drinking to reduce anxiety or by visibly displaying anxiety and subsequently drinking) and participants could be asked what drinking motives they believed the confederate displayed. If motives are directly observable, this strengthens the argument that they confer influence via socialization within dyads.

Fourth, my models should be extended to include other important mechanisms that may underlie the relationship between drinking motives and drinking behaviours among drinking buddies and romantic couples. Across Study 2 and Study 3, only change in individual social motives consistently mediated the relationship between partner/buddy social motives and individual drinking behaviour. That is, if a drinking buddy or romantic partner drank for social reasons, the actor also drank for social reasons which in turn was associated with increased drinking behaviour in the actor. Given this was the only consistent indirect effect found across both samples, there are likely other important mechanisms through which partner/drinking buddy motives impact individual drinking behaviour. Two potential mechanisms are injunctive and descriptive norms (Neighbors et al., 2008), as well as alcohol expectancies (Lau-Barraco et al., 2012). For example, a person may believe

drinking for enhancement reasons is normative if they see their drinking buddy drinking for that reason, which may in turn affect their drinking behaviour (mediation via injunctive norms). Similarly, a person may come to expect alcohol to reduce their anxiety after witnessing their partner drinking to cope, which may in turn affect their drinking behaviour (mediation via expectancies). Thus, future research might explore these mechanisms alongside drinking motives within these important dyadic pairs.

Finally, my models could be replicated in non-student, older adult, and clinical samples. Because the majority were in university, my participants may have differed from other emerging adults who withdrew from school, were in community college, unemployed, or employed. Such participants could be recruited through community targeted advertising. Older adults in the "baby boom" generation misuse alcohol at higher rates than previous older generations (Barry & Blow, 2016). Thus, investigating their motives for drinking within a social context might illuminate additional considerations for intervention. Moreover, clinical samples would likely endorse higher alcohol misuse base rates than emerging adults (Battista et al., 2013). In these samples, both actor and partner effects may be stronger for risky motives (i.e., enhancement and coping motives) given increased likelihood of heavy drinking. Investigating these relationships in the aforementioned samples is an important next step as replication would provide additional evidence that interventions should target drinking motives within NT and BCT.

Conclusions

In conclusion, my dissertation sought to better understand how drinking motives within close interpersonal relationships affect emerging adults' drinking behaviours. I investigated drinking motives theory (Cooper, 1994) from a social learning theory perspective (Bandura, 1971), using longitudinal data from drinking buddies and romantic

couples. I found that (1) romantic couples and drinking buddies are similar in terms of their drinking behaviours and drinking motives, (2) romantic partner and drinking buddy motives influence the individual to drink, (3) drinking motive influence occurs when averaged across time and when investigating co-occurring change across time, and (4) drinking motive change in the individual may underlie drinking motive influence among dyads. Specifically, romantic couples and drinking buddies were similar in overall drinking behaviours as well as overall drinking motives (an effect likely driven by similarity in enhancement and social motives for couples and social and coping-depression motives for drinking buddies). Enhancement and social motives were the strongest predictors of individual drinking among both drinking buddies and couples, both over time and when averaged across time. Romantic partner and drinking buddy enhancement, social, and coping-anxiety motives significantly predicted individual drinking behaviour among romantic partners and friends over time. Drinking motive partner influence was stronger for drinking frequency among drinking buddies and stronger for drinking quantity among romantic partners. Finally, individuals' social motives were influenced by their partner/drinking buddy's social motives, which in turn influenced the individuals' alcohol use. Taken together, these results offer growing evidence that drinking motives are important predictors of drinking not just within individuals, but within the social environment individuals live in (Cooper et al., 2016; Hussong, 2003). Thus, drinking motives represent important intervention and prevention targets for not only individually tailored interventions, but for dyadic therapeutic approaches as well.

Table 7.1. Integration of Study Findings

	Study 1 Dyad: Romantic couples	**Study 2** Dyad: Romantic couples	**Study 3** Dyad: Drinking buddies
Similarity	Similarity profiles → greater than chance for drinking behaviours AND combined drinking motives	Significant covariances → similar in enhancement and social motives across outcomes and levels of analysis	Significant covariances → social and coping-depression motives across outcomes and levels of analysis
Within Subjects			
CAM		• No actor or partner effects	• CAM → **actor** effect for **frequency** (0.82) • CAM → **partner** effect for **frequency** (0.53)
CDM		• No actor or partner effects	• CDM → **actor** effect for **frequency** (0.95) and **quantity** (0.40) • No partner effects
Enhancement		• EN → **actor** effect for **frequency** (0.12) and **quantity** (0.70) • EN → **partner** effect for **quantity** (0.60)	• EN → **actor** effect for **frequency** (0.69) and **quantity** (0.33) • EN → **partner** effect for **frequency** (0.56)
Social		• SC → **actor** for **frequency** (0.14) and **quantity** (0.72) • SC → **partner** for **quantity** (0.29)	• SC → **actor** effect for **frequency** (0.82) and **quantity** (0.30) • SC → **partner** effect for **frequency** (0.64)
Conformity		• No actor or partner effects	• CN → **actor** effect for **quantity** (0.31) • No partner effects
Between Subjects			
CAM		• CAM → **actor** effect for **frequency** (0.31) and **quantity** (0.66) • CAM → **partner** effect for **quantity** (0.64)	• CAM → **actor** effect for **frequency** (1.39) and **quantity** (0.68) • No partner effects
CDM		• CDM → **actor** effect for **frequency** (0.66) • No partner effects	• CDM → significant **actor** effect for **frequency** (1.18) • No partner effects
Enhancement		• EN → **actor** effect for **frequency** (0.30) and **quantity** (0.83) • EN → **partner** effect for **frequency** (0.14) and **quantity** (0.63)	• EN → **actor** effect for **frequency** (0.92) and **quantity** (0.87) • EN → **partner** effect for **quantity** (0.32)
Social		• SC → **actor** effect for **quantity** (1.02) • SC → **partner** effect for **quantity** (0.55)	• SC → **actor** effect for **frequency** (0.85) and **quantity** (0..84) • No partner effects
Conformity		• No actor or partner effects	• No actor or partner effects

Note. CAM = coping-anxiety motives; CDM = coping-depression motives; EN = enhancement motives; SC = social motives; CN = conformity motives. Bracketed values represent unstandardized path coefficients (*B).*

Table 7.2. Supplemental Replication of Similarity Coefficients and Correlations in Drinking Buddies

	M	*SD*	Possible Range	1	2	3	4	5	6
1. Drinking behaviour similarity	.47	.26	-1 – 1	--	.09 [-.07, .25]	.09 [-.06, .22]	.03 [-.12, .18]	.07 [-.08, .21]	.06 [-.19, .07]
2. Drinking motive similarity	.15	.38	-1 – 1		--	-.01 [-.17, .13]	-.03 [-.18, .11]	-.13 [-.28, .01]	-.11 [-.27, .06]
3. Days spent drinking together	2.07	1.76	0 – 30			--	**.38 [.26, .50]**	-.04 [-.22, .14]	.07 [-.07, .22]
4. Days with face-to-face contact	17.82	6.46	0 – 30				--	.14 [-.14, .13]	.22 [.31, .50]
5. Relationship length (months)	4.05	2.21	0.35 – 12					--	**.41 [.31, .50]**
6. Cohabitation status	.26	.44	0 or 1						--

Note. Cohabitation status was coded as "0" indicating no cohabitation and "1" indicating cohabitation, with the presented mean indicating the proportion of drinking buddies that were cohabitating. All correlations were performed using Pearson's *r*. Confidence intervals are based on 5,000 bootstrapped resamples. Bolded correlations are significant (i.e., do not contain zero within their confidence interval).

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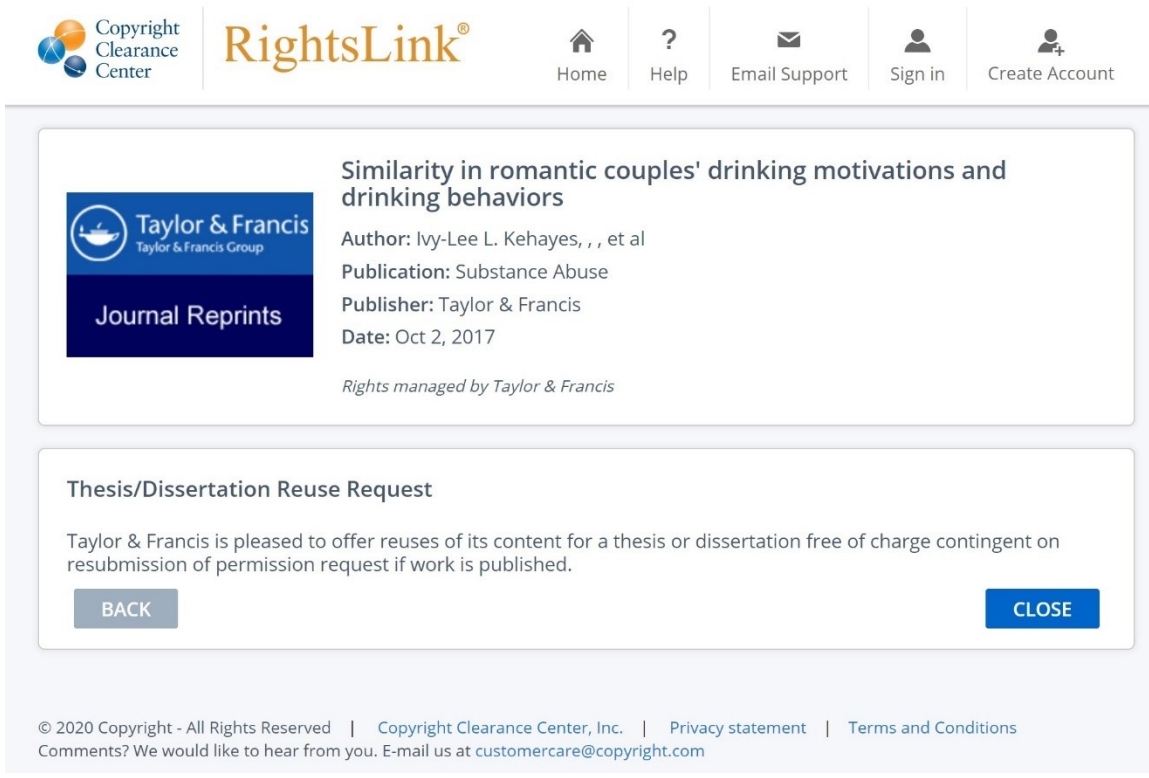
APPENDIX A. COPYRIGHT PERMISSION TO INCLUDE STUDY 1



APPENDIX B. MODIFIED DRINKING MOTIVES QUESTIONNAIRE-REVISED, 7-DAY VERSION

Below is a list of reasons people sometimes give for drinking alcohol. Thinking of all the times you drank alcohol **during the past 7 days**, how often would you say that you drink for each of the following reasons?

IF you did **NOT** drink ALCOHOL in the past month: Please fill in "N/A" (Not applicable) for **EACH** item. **During the past 7 days I drank …**

	Almost Never/ Never	Some of the Time	Half of the Time	Most of the Time	Almost Always /Always	Not Applicable
1. As a way to celebrate.	1	2	3	4	5	N/A
2. To relax.	1	2	3	4	5	N/A
3. Because I like the feeling.	1	2	3	4	5	N/A
4. Because it is what most of my friends do when we get together.	1	2	3	4	5	N/A
5. To forget my worries.	1	2	3	4	5	N/A
6. Because it is exciting.	1	2	3	4	5	N/A
7. To be sociable.	1	2	3	4	5	N/A
8. Because I feel more self-confident or sure of myself.	1	2	3	4	5	N/A
9. To get a high.	1	2	3	4	5	N/A
10. Because it is customary on special occasions.	1	2	3	4	5	N/A
11. Because it helps me when I am feeling nervous.	1	2	3	4	5	N/A
12. Because it's fun.	1	2	3	4	5	N/A
13. Because it makes a social gathering more enjoyable.	1	2	3	4	5	N/A
14. To cheer me up when I'm in a bad mood.	1	2	3	4	5	N/A
15. To be liked.	1	2	3	4	5	N/A

16. To numb my pain.	1	2	3	4	5	N/A
17. Because it helps me when I am feeling depressed.	1	2	3	4	5	N/A
18. So that others won't kid me about not using.	1	2	3	4	5	N/A
19. To reduce my anxiety.	1	2	3	4	5	N/A
20. To stop me from dwelling on things.	1	2	3	4	5	N/A
21. To turn off negative thoughts about myself.	1	2	3	4	5	N/A
22. To help me feel more positive about things in my life.	1	2	3	4	5	N/A
23. To stop me from feeling so hopeless about the future.	1	2	3	4	5	N/A
24. Because my friends pressure me to use.	1	2	3	4	5	N/A
25. To fit in with a group I like.	1	2	3	4	5	N/A
26. Because it makes me feel good.	1	2	3	4	5	N/A
27. To forget painful memories	1	2	3	4	5	N/A
28. So I won't feel left out.	1	2	3	4	5	N/A

Drinking Motive Scoring Key

Enhancement Motive Items = 3, 6, 9, 12, and 26
Social Motive Items = 1, 4, 7, 10, and 13
Conformity Motive Items = 15, 18, 24, 25, and 28
Coping-Anxiety Motive Items = 2, 8, 11, and 19
Coping-Depression Motive Items = 5, 14, 16, 17, 20, 21, 22, 23, and 27

APPENDIX C. TIMELINE FOLLOWBACK QUESTIONNAIRE, 7-DAY VERSION

Note: One example item is shown below, original questionnaire repeats 7 times.

To help us evaluate your drinking, we need to get an idea of what your alcohol use was like in the past 7 days.

The start date (day 1) is 7 days ago (not counting today). The end date (day 7) is yesterday. A calendar is shown below to help you remember the past 7 days.

We are looking for your best estimate for these questions

- We realize it isn't easy to recall things with 100% accuracy
- If you are not sure whether you drank 7 or 11 drinks or whether you drank on a Thursday or a Friday, give it your best guess!

Helpful hints:

- If you have an appointment book you can use it to help you recall your drinking.
- Think about holidays and personal events such as birthdays, vacations, or parties
- If you have regular drinking patterns, you can use this to help recall your drinking. For example, you may have a daily or weekend pattern, drinking more in the summer or on trips, or you may drink on Wednesdays after playing sports.

HOW TO COUNT DRINKS:

- We want to record the number of drinks in a standard format
- One drink is equal to 1 bottle of beer (12oz, 5%), one glass of wine (5oz, 10%-12%), one shot of hard liqour (1.5oz, 43%-50%), or one mixed drink containing a shot of hard liqour
- EX: if you had 3 beers and a double rum and coke, this would equal 5 drinks

STANDARD DRINK CONVERSIONS:

BEER/WINE COOLERS (5%)

- 1 bottle/can (12oz) = 1 drink
- 1 "tall boy" bottle/can (16 oz) = 1.3 drinks
- 1 pitcher/growler (64oz) = 5.3 drinks

MALT LIQUOR (~7%)

- 1 bottle/can (12oz) = 1.4 drinks
- 1 "tall boy" bottle/can (16 oz) = 1.9 drinks

WINE (10-12%)

- 1 glass of wine (5oz) = 1 drink
- 1 bottle of wine (25oz) = 5 drinks
- 1 large bottle of wine (40oz) = 8 drinks
- 1 bottle of fortified wine (25oz) = 8.3 drinks

LIQUEUR (15%-30%)

- 1 shot/1 mixed drink with 1 shot (1.5oz) = 0.5 drinks
- 12oz bottle (mickey/pint) = 4 drinks
- 26oz bottle (quart) = 8.5 drinks

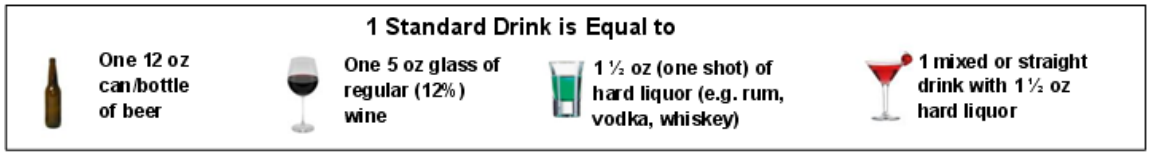
HARD LIQUOR (43%-50%)

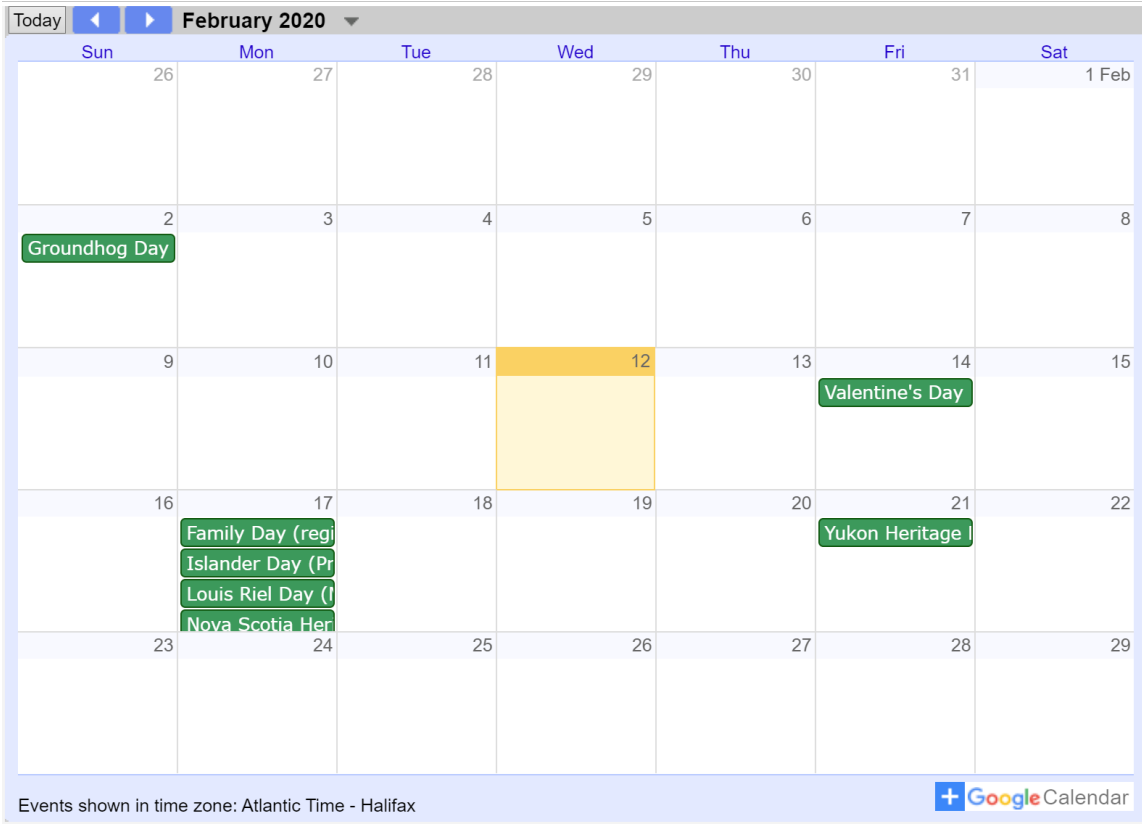
- 1 shot/1 mixed drink with 1 shot (1.5oz) = 1 drink
- 12oz bottle (mickey/pint) = 8 drinks
- 26oz bottle (quart) = 17 drinks
- 40oz bottle = 27 drinks

WHO YOU WERE DRINKING WITH:

- We are also interested in who you were with while you were drinking over the past 7 days.
- Include all the people you drank with that day, even if it was at different times throughout the day.
- You can select multiple items from the list provided.
- EX: If you drank with friends at 5pm and later went to a dance club with your study romantic partner at 11pm, you would list: Friends, Romantic Partner, and Strangers (assuming you don't know everyone at the club)

If you prefer not to answer these questions, please enter "**999**" for the number of drinks consumed, and select "**N/A**" for who you were drinking with.





2. How many drinks did you consume on:

   Mon Jan 13 2020

   Note: if you did not drink, please enter "0"

   ☐ drinks

3. Who were you drinking with on:

   Mon Jan 13 2020

   Please select all that apply.

   - ☐ Alone
   - ☐ Friends
   - ☐ Strangers
   - ☐ Family
   - ☐ Romantic Partner
   - ☐ N/A (I did not drink on this day)

APPENDIX D. SUPPLEMENTARY TABLES

Table D.1. Study 1 Descriptive Statistics

	Wave 1		Wave 2		Wave 3		Wave 4	
	M	SD	M	SD	M	SD	M	SD
Males (N = 191)								
Binge Drinking Episodes	0.95	1.73	0.97	2.01	0.72	1.18	0.71	1.20
Frequency of Drinking Days	2.30	1.66	1.93	1.88	1.83	1.78	1.72	1.76
Quantity of Drinks	3.85	3.42	3.56	3.85	3.09	3.47	3.08	3.59
Social Motive	2.41	1.00	2.38	1.04	2.12	0.98	2.23	1.06
Enhancement Motive	2.29	1.05	2.18	1.04	2.12	0.98	2.11	1.08
Coping-Anxiety Motive	1.75	0.77	1.65	0.64	1.57	0.60	1.63	0.66
Coping-Depression Motive	1.26	0.50	1.18	0.42	1.13	0.32	1.17	0.48
Conformity Motive	1.15	0.49	1.11	0.34	1.09	0.26	1.12	0.41
Females (N = 215)								
Binge Drinking Episodes	0.73	1.00	0.73	1.10	0.65	1.03	0.59	1.03
Frequency of Drinking Days	1.96	1.54	1.68	1.64	1.75	1.71	1.58	1.69
Quantity of Drinks	2.88	2.47	2.73	2.68	2.55	2.72	2.46	2.60
Social Motive	2.68	1.01	2.44	1.04	2.46	1.04	2.18	1.08
Enhancement Motive	2.44	1.06	2.29	1.03	2.20	1.01	2.05	0.97
Coping-Anxiety Motive	1.94	0.91	1.77	0.82	1.67	0.75	1.71	0.72
Coping-Depression Motive	1.43	0.73	1.32	0.68	1.29	0.62	1.24	0.59
Conformity Motive	1.19	0.42	1.17	0.51	1.19	0.50	1.11	0.29

Table D.2. Study 2 Bivariate Correlations Between Residualized Drinking Motivations and Outcome Variables

	Quantity (Original)	Quantity (Residualized)	Quantity (Residualized v2.)	Frequency (Original)	Frequency (Residualized)	Frequency (Residualized v2.)
Between-Subjects						
CDM	.16	-.12	--	.21	.14	--
CAM	**.23*** **	-.06	--	**.24*** **	.07	--
Enhancement	**.45*** **	**.28** **	**.46*** **	**.27*** **	.14	**.21** **
Conformity	.11	.03	--	-.03	-.11	--
Social	**.49*** **	**.30***	**.49*** **	.12	.02	.09
Within-Subjects						
CDM	-.03	.02	--	.06	.03	--
CAM	.00	**-.08***	--	.05	-.03	--
Enhancement	**.12*** **	.05	**.14** **	.06	-.01	**.07***
Conformity	.02	.03	--	.04	.01	--
Social	**.14***	.08	**.14***	**.10*** **	.05	**.07***

Note. Original = bivariate correlations found in Table 4.2 of the manuscript. Residualized = residual motive scores representing the unique effects of each individual motive after removing the shared variance of the all other motives. Residualized v2. = residual enhancement and social motive scores after removing the shared variance of CDM, CAM and conformity. CDM = coping-depression motives; Enhancement = enhancement motives; Social = social motives; Conformity = conformity motives. Bolded path coefficients and covariances are significant at *$p < .05$. **$p < .01$. ***$p < .001$

Table D.3. Study 2 Multilevel Distinguishable Actor-Partner Interdependence Model Coefficients

	Outcome: Frequency					
	Female		Male			
	Actor Effects	Partner Effects	Actor Effects	Partner Effects	Correlation: Predictor	Correlation: Outcome
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Within Subjects						
CAM	0.04 (.09)	0.14 (.14)	0.24 (.14)	-0.01 (.14)	-0.01 (.14)	**0.69 (.09)***
CDM	0.00 (.08)	**0.39 (.18)***	**0.40 (.20)***	-0.14 (.14)	**0.03 (.01)***	**0.52 (.09)***
Enhancement	0.05 (.08)	0.04 (.09)	0.20 (.10)	-0.06 (.09)	0.05 (.03)	**0.52 (.09)***
Social	**0.20 (.08)****	0.01 (.06)	0.10 (.07)	0.05 (.08)	**0.11 (.03)***	**0.52 (.09)***
Conformity	0.17 (.14)	0.28 (.24)	0.01 (.33)	0.30 (.16)	0.01 (.01)	**0.52 (.09)***
Between Subjects						
CAM	**0.36 (.18)***	0.13 (.17)	**0.38 (.19)***	0.12 (.16)	0.08 (.05)	**0.78 (.14)***
CDM	**0.67 (.23)****	-0.04 (.25)	0.23 (.37)	0.18 (.25)	0.03 (.03)	**0.79 (.14)***
Enhancement	**0.35 (.13)****	0.14 (.10)	0.24 (.12)	0.25 (.14)	**0.27 (.08)****	**0.72 (.13)***
Social	0.10 (.16)	0.09 (.18)	0.17 (.19)	0.11 (.18)	**0.29 (.06)****	**0.82 (.16)***
Conformity	-0.10 (.49)	0.10 (.40)	0.03 (.39)	-0.13 (.47)	0.03 (.02)	**0.83 (.16)***
	Outcome: Quantity					
	Female		Male			
	Actor Effects	Partner Effects	Actor Effects	Partner Effects	Correlation: Predictor	Correlation: Outcome
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Within Subjects						
CAM	-0.01 (.20)	0.27 (.36)	0.01 (.31)	0.02 (.25)	**0.04 (.01)****	**1.28 (.63)***
CDM	-0.79 (.98)	0.68 (.49)	0.18 (.41)	0.17 (.39)	**0.03 (.01)***	**1.29 (.60)***
Enhancement	**0.74 (.25)****	-0.03 (.46)	**0.71 (.22)****	**0.78 (.20)*****	0.05 (.03)	1.05 (.57)
Social	**0.56 (.13)*****	-0.28 (.50)	**0.73 (.20)*****	**0.38 (.14)****	**0.11 (.03)****	**1.25 (.45)****
Conformity	0.04 (.33)	0.87 (.48)	0.64 (.38)	0.29 (.22)	0.01 (.01)	**1.24 (.63)***
Between Subjects						
CAM	**0.65 (.23)****	0.11 (.28)	0.65 (.49)	**0.88 (.38)***	0.08 (.05)	**2.65 (.45)***
CDM	0.75 (.58)	-0.14 (.54)	0.86 (1.02)	**0.85 (.41)***	0.03 (.03)	**2.82 (.44)***
Enhancement	**0.61 (.29)***	**0.50 (.24)*****	**0.97 (.26)*****	**0.88 (.28)****	**0.26 (.08)****	**1.95 (.43)***
Social	**0.67 (.23)****	**0.58 (.27)****	**1.40 (.48)****	0.51 (.38)	**0.29 (.06)*****	**2.03 (.42)***
Conformity	**1.29 (.72)***	-0.50 (.71)	-0.78 (.95)	2.19 (1.12)	0.03 (.02)	**2.76 (.50)***

Note. Partner effects underneath "female" indicate the male partner is having a significant effect on the female's behaviour. Partner effects under "male" indicate the female partner is having a significant effect on the male's behaviour. CAM = coping-anxiety motives; CDM = coping-depression motives; Enhancement = enhancement motives; Social = social motives; Conformity = conformity motives. Bolded path coefficients and covariances are significant at *$p < .05$. **$p < .01$. ***$p < .001$

Table D.4. Study 2 95% Confidence Intervals of Unstandardized Indirect Effects

Predictor	Mediator	Outcome	Indirect Effect [95% CI] Within Subjects	Indirect Effect [95% CI] Between Subjects
Partner's CAM	Actor's CAM	Actor's DF	[-0.002, 0.007]	[-0.011, 0.058]
Partner's CDM	Actor's CDM	Actor's DF	[-0.002, 0.009]	[-0.009, 0.049]
Partner's enhancement	Actor's enhancement	Actor's DF	[-0.002, 0.014]	**[0.012, 0.131]**
Partner's social	Actor's social	Actor's DF	**[0.002, 0.026]**	[-0.005, 0.120]
Partner's conformity	Actor's conformity	Actor's DF	[-0.002, 0.004]	[-0.011, 0.016]
Partner's CAM	Actor's CAM	Actor's DQ	[-0.012, 0.011]	[-0.011, 0.114]
Partner's CDM	Actor's CDM	Actor's DQ	[-0.016, 0.010]	[-0.026, 0.081]
Partner's enhancement	Actor's enhancement	Actor's DQ	[-0.002, 0.071]	**[0.061, 0.342]**
Partner's social	Actor's social	Actor's DQ	**[0.019, 0.127]**	**[0.108, 0.485]**
Partner's conformity	Actor's conformity	Actor's DQ	[-0.005, 0.014]	[-0.031, 0.040]

Note. CAM = coping-anxiety motives; CDM = coping-depression motives; Enhancement = enhancement motives; Social = social motives; Conformity = conformity motives. DF = drinking frequency; DQ = drinking quantity. Significant indirect effects at the $p < .05$ level are bolded.

Table D.5. Study 3 95% Confidence Intervals of Unstandardized Indirect Effects

Predictor	Mediator	Outcome	Indirect Effect [95% CI] Within Subjects	Indirect Effect [95% CI] Between Subjects
Partner's CAM	Actor's CAM	Actor's drinking frequency	[-0.008, 0.037]	[-0.023, 0.171]
Partner's CDM	Actor's CDM	Actor's drinking frequency	[-0.013, 0.026]	[-0.001, 0.145]
Partner's enhancement	Actor's enhancement	Actor's drinking frequency	[-0.006, 0.047]	[-0.039, 0.231]
Partner's social	Actor's social	Actor's drinking frequency	**[0.005, 0.083]**	[-0.081, 0.089]
Partner's conformity	Actor's conformity	Actor's drinking frequency	[-0.005, 0.010]	[-0.012, 0.026]
Partner's CAM	Actor's CAM	Actor's drinking quantity	[-0.003, 0.011]	[-0.012, 0.084]
Partner's CDM	Actor's CDM	Actor's drinking quantity	[-0.005, 0.011]	[-0.009, 0.071]
Partner's enhancement	Actor's enhancement	Actor's drinking quantity	[-0.004, 0.023]	[-0.032, 0.208]
Partner's social	Actor's social	Actor's drinking quantity	[0.000, 0.033]	[-0.078, 0.088]
Partner's conformity	Actor's conformity	Actor's drinking quantity	[-0.004, 0.008]	[-0.014, 0.011]

Note. CAM = coping-anxiety motives; CDM = coping-depression motives; Enhancement = enhancement motives; Social = social motives; Conformity = conformity motives. Significant indirect effects at the $p < .05$ level are bolded.

Table D.6. Study 3 Multilevel Indistinguishable Actor-Partner Interdependence Model Coefficients Constrained by Sex

	Outcome: Frequency							
	Actor Effects		Partner Effects		Covariance: Predictor		Covariance: Outcome	
	B (*SE*)	*p*	*B* (*SE*)	*p*	*B* (*SE*)	*p*	*B* (*SE*)	*p*
Within Subjects								
CAM	**1.06 (0.27)**	**< .001**	**0.72 (0.24)**	**.003**	0.02 (0.01)	.161	**4.13 (0.64)**	**< .001**
CDM	**1.01 (0.35)**	**.004**	**0.78 (0.31)**	**.012**	0.01 (0.01)	.440	**4.19 (0.67)**	**< .001**
Enhancement	**0.91 (0.21)**	**< .001**	**0.77 (0.19)**	**< .001**	**0.04 (0.02)**	**.025**	**4.07 (0.70)**	**< .001**
Social	**0.89 (0.18)**	**< .001**	**0.79 (0.18)**	**< .001**	**0.07 (0.02)**	**< .001**	**3.90 (0.69)**	**< .001**
Conformity	0.33 (0.36)	.352	0.42 (0.32)	.194	0.01 (0.01)	.571	**4.51 (0.69)**	**< .001**
Between Subjects								
CAM	**1.19 (0.41)**	**.004**	0.30 (0.26)	.236	0.045 (0.03)	.178	**2.00 (0.75)**	**.007**
CDM	**1.16 (0.42)**	**.006**	0.42 (0.31)	.182	**0.05 (0.03)**	**.042**	**2.04 (0.78)**	**.009**
Enhancement	**1.01 (0.20)**	**< .001**	0.17 (0.18)	.334	0.12 (0.07)	.076	**1.87 (0.70)**	**.008**
Social	**0.91 (0.26)**	**< .001**	0.39 (0.22)	.071	0.02 (0.05)	.630	**1.86 (0.75)**	**.013**
Conformity	0.19 (0.49)	.690	0.13 (0.41)	.746	0.01 (0.02)	.392	**2.26 (0.83)**	**.006**
	Outcome: Quantity							
	Actor Effects		Partner Effects		Covariance: Predictor		Covariance: Outcome	
	B (*SE*)	*p*	*B* (*SE*)	*p*	*B* (*SE*)	*p*	*B* (*SE*)	*p*
Within Subjects								
CAM	0.14 (0.16)	.379	0.07 (0.14)	.620	0.02 (0.01)	.134	**0.67 (0.18)**	**< .001**
CDM	0.23 (0.20)	.246	0.07 (0.17)	.677	0.01 (0.01)	.452	**0.67 (0.18)**	**< .001**
Enhancement	**0.39 (0.13)**	**.002**	0.09 (0.10)	.396	**0.04 (0.02)**	**.024**	**0.67 (0.18)**	**< .001**
Social	**0.34 (0.13)**	**.008**	-0.02 (0.10)	.866	**0.07 (0.02)**	**< .001**	**0.68 (0.18)**	**< .001**
Conformity	0.20 (0.20)	.333	0.19 (0.18)	.284	0.01 (0.01)	.587	**0.66 (0.18)**	**< .001**
Between Subjects								
CAM	**0.58 (0.26)**	**.025**	0.09 (0.21)	.661	0.05 (0.03)	.177	**2.58 (0.54)**	**< .001**
CDM	**0.57 (0.26)**	**.029**	0.26 (0.28)	.349	**0.06 (0.03)**	**.038**	**2.51 (0.55)**	**< .001**
Enhancement	**0.90 (0.14)**	**< .001**	**0.36 (0.12)**	**.002**	0.11 (0.07)	.096	**1.98 (0.47)**	**< .001**
Social	**0.87 (0.20)**	**< .001**	**0.43 (0.19)**	**.025**	0.02 (0.05)	.669	**2.25 (0.46)**	**< .001**
Conformity	0.11 (0.35)	.744	0.16 (0.31)	.613	0.01 (0.02)	.364	**2.63 (0.51)**	**< .001**

Note. CAM = coping-anxiety motives; CDM = coping-depression motives; Enhancement = enhancement motives; Social = social motives; Conformity = conformity motives Significant paths at the $p < .05$ level are bolded.

Table D.7. Study 3 Multilevel Distinguishable Actor-Partner Interdependence Model Coefficients Unconstrained by Sex

	Outcome: Frequency							
	Male				Female			
	Actor Effects	Partner Effects	Correlation: Predictor	Correlation: Outcome	Actor Effects	Partner Effects	Correlation: Predictor	Correlation: Outcome
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Within Subjects								
CAM	**0.96 (0.45)**	**1.52 (0.50)**	0.00 (0.03)	**6.74 (1.80)**	**1.13 (0.34)**	0.49 (0.27)	0.02 (0.01)	**3.47 (0.64)**
CDM	0.86 (0.65)	1.39 (0.73)	-0.03 (0.04)	**6.93 (1.85)**	**1.16 (0.42)**	0.66 (0.34)	0.01 (0.01)	**3.48 (0.66)**
Enhancement	**0.83 *0.37)**	**1.29 (0.42)**	0.01 (0.04)	**6.61 (1.99)**	**0.94 (0.24)**	**0.58 (0.20)**	**0.05 (0.02)**	**3.40 (0.68)**
Social	0.53 (0.41)	0.79 (0.45)	-0.06 (0.04)	**7.26 (2.19)**	**1.04 (0.21)**	**0.74 (0.19)**	**0.11 (0.02)**	**3.09 (0.63)**
Conformity	0.80 (0.62)	1.22 (0.74)	-0.03 (0.05)	**7.10 (1.98)**	0.13 (0.46)	0.16 (0.36)	0.01 (0.01)	**3.75 (0.69)**
Between Subjects								
CAM	**1.90 (0.66)**	-0.66 (0.71)	0.00 (0.06)	2.99 (1.66)	**1.04 (0.46)**	**0.55 (0.27)**	0.07 (0.04)	**1.94 (0.79)**
CDM	**2.46 (0.84)**	-0.43 (1.11)	0.02 (0.04)	2.49 (1.82)	0.86 (0.25)	0.60 (0.33)	0.07 (0.04)	**2.11 (0.85)**
Enhancement	**1.31 (0.37)**	-0.23 (0.36)	0.01 (0.11)	2.46 (1.54)	**0.93 (0.23)**	0.31 (0.20)	0.16 (0.08)	**1.81 (0.74)**
Social	**1.19 (0.46)**	-0.13 (0.41)	-0.04 (0.12)	2.28 (1.66)	**0.86 (0.30)**	**0.54 (0.25)**	0.05 (0.05)	**1.83 (0.78)**
Conformity	0.65 (1.18)	-1.20 (0.81)	0.06 (0.06)	2.16 (1.80)	0.36 (0.55)	0.68 (0.51)	-0.00 (0.02)	**2.31 (0.93)**
	Outcome: Quantity							
	Male				Female			
	Actor Effects	Partner Effects	Correlation: Predictor	Correlation: Outcome	Actor Effects	Partner Effects	Correlation: Predictor	Correlation: Outcome
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Within Subjects								
CAM	-0.07 (0.27)	0.22 (0.33)	0.00 (0.03)	**1.28 (0.40)**	0.22 (0.19)	0.03 (0.16)	0.02 (0.01)	**0.57 (0.19)**
CDM	0.11 (0.31)	0.13 (0.55)	-0.03 (0.05)	**1.27 (0.41)**	0.31 (0.25)	0.07 (0.17)	0.01 (0.01)	**0.57 (0.19)**
Enhancement	0.38 (0.21)	0.43 (0.30)	0.02 (0.04)	**1.14 (0.41)**	**0.40 (0.16)**	-0.01 (0.09)	**0.05 (0.02)**	**0.59 (0.19)**
Social	0.05 (0.29)	0.02 (0.26)	-0.06 (0.04)	**1.28 (0.40)**	**0.45 (0.16)**	-0.06 (0.13)	**0.11 (0.02)**	**0.57 (0.19)**
Conformity	-0.06 (0.23)	0.41 (0.52)	-0.04 (0.06)	**1.27 (0.40)**	0.34 (0.26)	0.14 (0.19)	0.01 (0.01)	**0.56 (0.19)**
Between Subjects								
CAM	0.62 (0.56)	-0.55 (0.50)	0.01 (0.06)	**5.15 (1.43)**	**0.61 (0.28)**	0.26 (0.22)	0.07 (0.04)	**1.97 (0.44)**
CDM	0.41 (0.74)	-0.64 (0.71)	0.03 (0.04)	**5.06 (1.41)**	**0.66 (0.23)**	0.47 (0.27)	0.07 (0.04)	**1.91 (0.46)**
Enhancement	**1.09 (0.33)**	0.38 (0.25)	-0.01 (0.11)	**4.38 (1.30)**	**0.85 (0.16)**	**0.35 (0.13)**	0.16 (0.08)	**1.50 (0.38)**
Social	**1.35 (0.43)**	0.27 (0.38)	-0.03 (0.12)	**4.58 (1.29)**	**0.74 (0.21)**	**0.45 (0.22)**	0.04 (0.05)	**1.73 (0.38)**
Conformity	0.27 (0.41)	-0.95 (0.53)	0.07 (0.06)	**5.02 (1.40)**	0.30 (0.48)	0.57 (0.34)	0.00 (0.02)	**2.05 (0.44)**

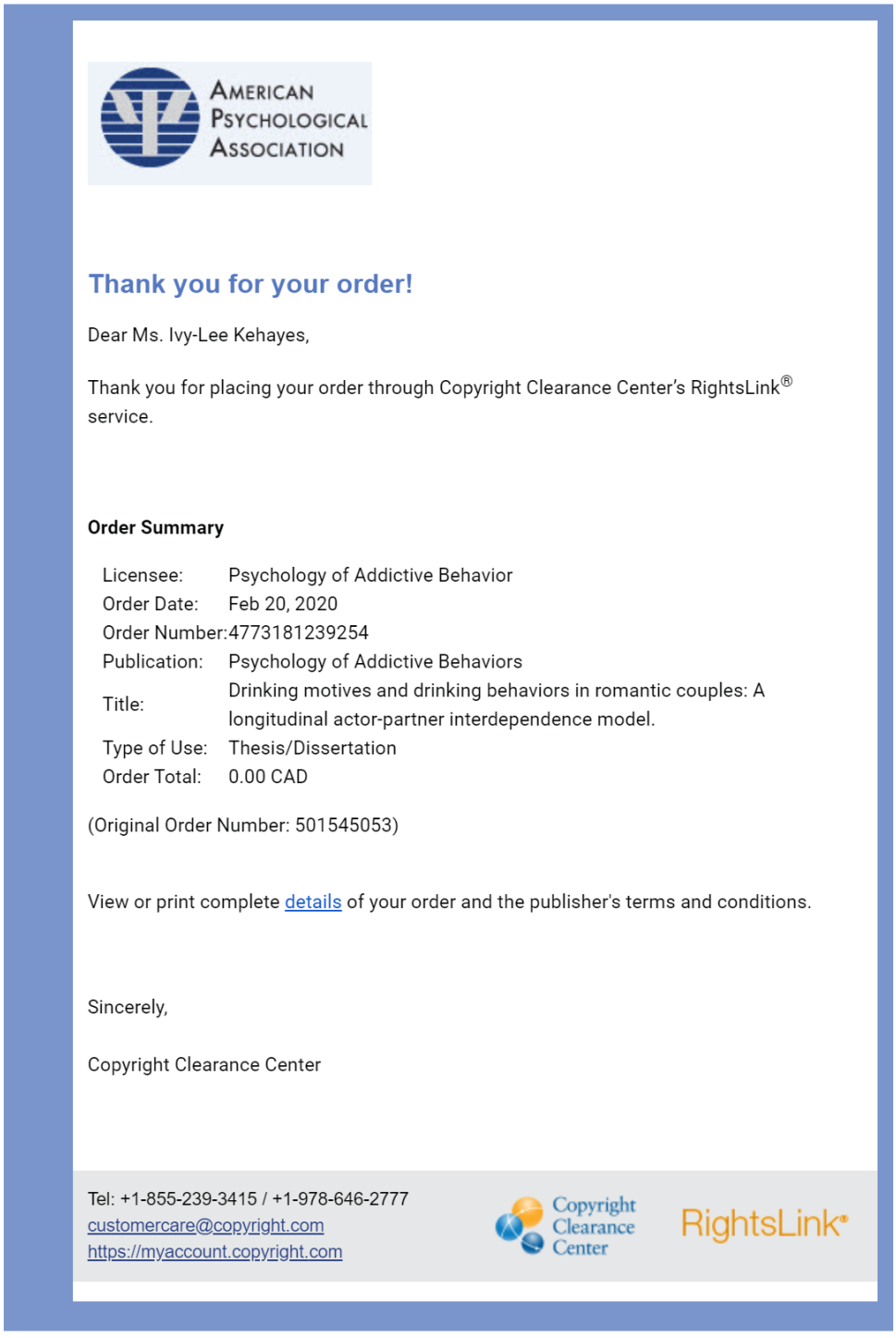
Note. CAM = coping-anxiety motives; CDM = coping-depression motives; Enhancement = enhancement motives; Social = social motives; Conformity = conformity motives. Significant paths at the $p < .05$ level are bolded.

Table D.8. Study 3 Multilevel Actor-Partner Interdependence Model BIC Value Comparison

Outcome: Frequency			
	Unconstrained BIC	Constrained BIC	ΔBIC
Coping-Anxiety Motives	8871.705	8837.491	34.214
Coping-Depression Motives	8517.396	8481.074	36.322
Enhancement Motives	9386.725	9349.556	37.169
Social Motives	9314.702	9292.905	21.797
Conformity Motives	8482.901	8445.837	37.064
Outcome: Quantity			
	Unconstrained BIC	Constrained BIC	ΔBIC
Coping-Anxiety Motives	7868.607	7830.497	38.11
Coping-Depression Motives	7500.160	7462.194	37.966
Enhancement Motives	8354.204	8316.296	37.908
Social Motives	8293.581	8270.758	22.823
Conformity Motives	7440.912	7405.959	34.953

Note. "Unconstrained" indicates models unconstrained by sex; "Constrained" indicates models constrained by sex.

APPENDIX E. COPYRIGHT PERMISSION TO INCLUDE STUDY 2



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The following letter was sent to all co-authors: Dr. Sean Mackinnon, Dr. Simon Sherry, Dr. Kenneth Leonard, and Dr. Sherry Stewart.

June 1, 2020

Dr. co-authors,

I am preparing my Ph.D. thesis for submission to the Faculty of Graduate Studies at Dalhousie University, Halifax, Nova Scotia, Canada. I am seeking your permission to include a manuscript version of the following paper in the thesis:

Kehayes, I. L., Mackinnon, S. P., Sherry, S. B., Leonard, K. E., & Stewart, S. H. (submitted March 2020). The influence of drinking buddies: A longitudinal investigation of drinking motivations and drinking behaviours in emerging adults. *Substance Use and Misuse.*

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Full publication details and a copy of this permission letter will be included in the thesis.

Thank you,
Ivy-Lee Kehayes

Their responses (i.e., permissions) are included below.

Sherry Stewart
to Sherry, Simon, Ivy-Lee, Sean,

Of course Ivy-Lee. Happy to have it included.

Sherry

Simon Sherry
to Sherry, Ivy-Lee, Sherry, Sean,

No problem on my end. Glad to see this moving forward.

Sincerely,

Dr. Simon Sherry, Ph.D., Registered Psychologist

Leonard, Kenneth via dalu.onmicrosoft.com
to Simon, Sherry, Ivy-Lee, Sherry, Sean,

Hi Ivy-Lee, yes absolutely!

Kenneth Leonard, PhD
Director
Research Institute on Addictions
University at Buffalo

Sean Mackinnon
to Ivy-Lee

Hi Ivy-Lee,

Sure, you can use the paper "The influence of drinking buddies: A longitudinal investigation of drinking motivations and drinking behaviours in emerging adults" in your dissertation.

Sincerely,

--Sean--
Sean P. Mackinnon, PhD
Department of Psychology and Neuroscience
Dalhousie University
1355 Oxford Street, PO BOX 15000
Halifax, NS, B3H 4R2

APPENDIX G. MODIFIED DRINKING MOTIVES QUESTIONNAIRE-REVISED, 30-DAY VERSION

Below is a list of reasons people sometimes give for drinking alcohol. Thinking of all the times you drank alcohol **during the past 30 days**, how often would you say that you drink for each of the following reasons?

IF you did **NOT** drink ALCOHOL in the past month: Please fill in "N/A" (Not applicable) for **EACH** item. **During the past 30 days I drank …**

	Almost Never/ Never	Some of the Time	Half of the Time	Most of the Time	Almost Always /Always	Not Applicable
1. As a way to celebrate.	1	2	3	4	5	N/A
2. To relax.	1	2	3	4	5	N/A
3. Because I like the feeling.	1	2	3	4	5	N/A
4. Because it is what most of my friends do when we get together.	1	2	3	4	5	N/A
5. To forget my worries.	1	2	3	4	5	N/A
6. Because it is exciting.	1	2	3	4	5	N/A
7. To be sociable.	1	2	3	4	5	N/A
8. Because I feel more self-confident or sure of myself.	1	2	3	4	5	N/A
9. To get a high.	1	2	3	4	5	N/A
10. Because it is customary on special occasions.	1	2	3	4	5	N/A
11. Because it helps me when I am feeling nervous.	1	2	3	4	5	N/A
12. Because it's fun.	1	2	3	4	5	N/A
13. Because it makes a social gathering more enjoyable.	1	2	3	4	5	N/A
14. To cheer me up when I'm in a bad mood.	1	2	3	4	5	N/A
15. To be liked.	1	2	3	4	5	N/A

16. To numb my pain.	1	2	3	4	5	N/A
17. Because it helps me when I am feeling depressed.	1	2	3	4	5	N/A
18. So that others won't kid me about not using.	1	2	3	4	5	N/A
19. To reduce my anxiety.	1	2	3	4	5	N/A
20. To stop me from dwelling on things.	1	2	3	4	5	N/A
21. To turn off negative thoughts about myself.	1	2	3	4	5	N/A
22. To help me feel more positive about things in my life.	1	2	3	4	5	N/A
23. To stop me from feeling so hopeless about the future.	1	2	3	4	5	N/A
24. Because my friends pressure me to use.	1	2	3	4	5	N/A
25. To fit in with a group I like.	1	2	3	4	5	N/A
26. Because it makes me feel good.	1	2	3	4	5	N/A
27. To forget painful memories	1	2	3	4	5	N/A
28. So I won't feel left out.	1	2	3	4	5	N/A

Drinking Motive Scoring Key

Enhancement Motive Items = 3, 6, 9, 12, and 26
Social Motive Items = 1, 4, 7, 10, and 13
Conformity Motive Items = 15, 18, 24, 25, and 28
Coping-Anxiety Motive Items = 2, 8, 11, and 19
Coping-Depression Motive Items = 5, 14, 16, 17, 20, 21, 22, 23, and 27

APPENDIX H. TIMELINE FOLLOWBACK QUESTIONNAIRE, 30-DAY VERSION

Note: One example item is shown below, original questionnaire repeats 30 times.

To help us evaluate your drinking, we need to get an idea of what your alcohol use was like in the past 30 days.

The start date (day 1) is 30 days ago (not counting today). The end date (day 30) is yesterday. A calendar is shown below to help you remember the past 7 days.

We are looking for your best estimate for these questions

- We realize it isn't easy to recall things with 100% accuracy
- If you are not sure whether you drank 7 or 11 drinks or whether you drank on a Thursday or a Friday, give it your best guess!

Helpful hints:

- If you have an appointment book you can use it to help you recall your drinking.
- Think about holidays and personal events such as birthdays, vacations, or parties
- If you have regular drinking patterns, you can use this to help recall your drinking. For example, you may have a daily or weekend pattern, drinking more in the summer or on trips, or you may drink on Wednesdays after playing sports.

HOW TO COUNT DRINKS:

- We want to record the number of drinks in a standard format
- One drink is equal to 1 bottle of beer (12oz, 5%), one glass of wine (5oz, 10%-12%), one shot of hard liqour (1.5oz, 43%-50%), or one mixed drink containing a shot of hard liqour
- EX: if you had 3 beers and a double rum and coke, this would equal 5 drinks

STANDARD DRINK CONVERSIONS:

BEER/WINE COOLERS (5%)

- 1 bottle/can (12oz) = 1 drink
- 1 "tall boy" bottle/can (16 oz) = 1.3 drinks
- 1 pitcher/growler (64oz) = 5.3 drinks

MALT LIQUOR (~7%)

- 1 bottle/can (12oz) = 1.4 drinks
- 1 "tall boy" bottle/can (16 oz) = 1.9 drinks

WINE (10-12%)

- 1 glass of wine (5oz) = 1 drink
- 1 bottle of wine (25oz) = 5 drinks
- 1 large bottle of wine (40oz) = 8 drinks
- 1 bottle of fortified wine (25oz) = 8.3 drinks

LIQUEUR (15%-30%)

- 1 shot/1 mixed drink with 1 shot (1.5oz) = 0.5 drinks
- 12oz bottle (mickey/pint) = 4 drinks
- 26oz bottle (quart) = 8.5 drinks

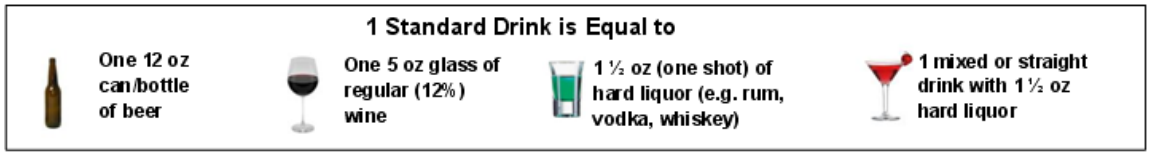
HARD LIQUOR (43%-50%)

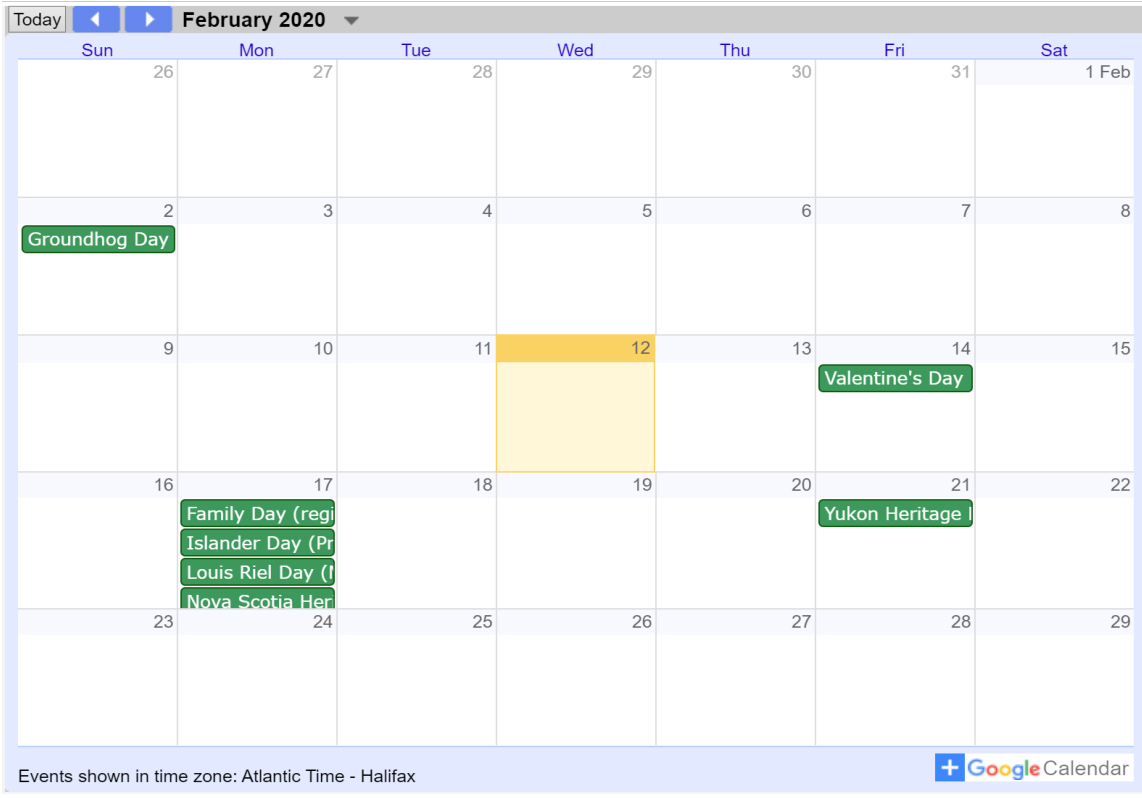
- 1 shot/1 mixed drink with 1 shot (1.5oz) = 1 drink
- 12oz bottle (mickey/pint) = 8 drinks
- 26oz bottle (quart) = 17 drinks
- 40oz bottle = 27 drinks

WHO YOU WERE DRINKING WITH:

- We are also interested in who you were with while you were drinking over the past 30 days.
- Include all the people you drank with that day, even if it was at different times throughout the day.
- You can select multiple items from the list provided.
- EX: If you drank with friends at 5pm and later went to a dance club with your study romantic partner at 11pm, you would list: Friends, Study Drinking Buddy, and Strangers (assuming you don't know everyone at the club)

If you prefer not to answer these questions, please enter "**999**" for the number of drinks consumed, and select "**N/A**" for who you were drinking with.





2. How many drinks did you consume on:

   Mon Jan 13 2020

   Note: if you did not drink, please enter "0"

   ☐ drinks

3. Who were you drinking with on:

   Mon Jan 13 2020

   Please select all that apply.

   - ☐ Alone
   - ☐ Study Drinking Buddy
   - ☐ Other Friends
   - ☐ Strangers
   - ☐ Family
   - ☐ Romantic Partner
   - ☐ N/A (I did not drink on this day)