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Factors Moderating the Association Between Social Network "Drinking Buddies" and Personal Drinking

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FACTORS MODERATING THE ASSOCIATION BETWEEN SOCIAL NETWORK "DRINKING BUDDIES" AND PERSONAL DRINKING

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ABSTRACT

FACTORS MODERATING THE ASSOCIATION BETWEEN SOCIAL NETWORK "DRINKING BUDDIES" AND PERSONAL DRINKING

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Peer relationships have been implicated as a salient factor on individual drinking outcomes. One specific subset of peers in one's social network, identified as drinking buddies, have been associated with an elevated risk for harmful drinking in college students—beyond drinking peers in one's network alone. Despite their salience on individual alcohol outcomes, little is known regarding what makes drinking buddies more or less influential. While moderators of peer influence have been examined, prior research on peer influence predominantly focuses on adolescent populations, presenting gaps in the literature regarding moderators of college student drinking buddies specifically. As such, the current study sought to investigate three domains of moderators: 1) characteristics of the individual, 2) characteristics of the peer, and 3) characteristics of their relationship on the association between presence of drinking buddies in one's network and individual drinking outcomes. Guided by SCT, social-cognitive characteristics of the individual (e.g., drinking refusal self-efficacy and alcohol outcome expectancies) were examined as moderators. In addition, perceptions of one's peer (e.g., descriptive norms, injunctive norms, and perceived popularity) were investigated as moderators. Finally, perceptions of the drinking buddy relationship quality (e.g., stability, intimacy, and support) were examined as moderators. Participants were 130 (86.2% female, M_{age} = 20.53) college student drinkers who completed an online self-report survey which assessed drinking

behaviors, several drinking-related psychosocial constructs, and perceptions of drinking buddies and drinking buddy relationships. Results indicated that descriptive norms significantly moderated the association between the proportion of drinking buddies in one's network and individual drinking quantity. No other significant moderations emerged. Findings should be interpreted in light of the fact that the proportion of drinking buddies did not significantly predict our drinking outcomes (drinking quantity, frequency, and consequences), and the fact that our analyses were not adequately powered. This study was among the first to examine factors that may exacerbate or buffer drinking buddy influence. Findings contribute to a limited body of literature assessing this particularly risky subset of peers in one's network. Future research should investigate the feasibility of a descriptive norms intervention on influential drinking buddy relationships.

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CHAPTER I

INTRODUCTION

Many college students engage in alcohol consumption (Substance Abuse and Mental Health Services Administration [SAMHSA], 2020). Nearly 56% of college students report alcohol use in the last 30 days, and amongst those, 33% reported binge drinking—defined as consuming 5 or more drinks in a single drinking episode (Schulenberg et al., 2021; SAMHSA, 2020). Binge drinking episodes have been associated with a variety of consequences, including poor academic performance (Presley & Pimentel, 2006), increased risk for physical and sexual assault (Carey et al., 2015; Hingson et al., 2005; Lawyer et al., 2010), and even death (Hingson et al., 2017). Furthermore, approximately 9% of college students between the ages of 18 to 22 meet current criteria for Alcohol Use Disorder (SAMHSA, 2019). Given the impact alcohol use continues to have on college populations, additional research that identifies factors that relate to college student drinking is warranted.

One factor that may explain the prevalence of drinking in college student populations is peer relationships. Peer alcohol consumption is consistently linked to individual alcohol consumption among college students (Reid & Carey, 2018). Moreover, peer alcohol consumption is associated with greater risk for personal alcohol-related consequences (Reid & Carey, 2018). One particular type of peer relationship, labeled *drinking buddies,* has been identified as a salient factor in predicting individual drinking (Reifman et al., 2006). Drinking buddies are defined as individuals with whom one engages in activities that revolve around drinking with, and have been shown to exert more influence on personal alcohol consumption as compared to peers not identified as a drinking buddy (Reifman et al., 2006). However, research on drinking buddies has failed to investigate what strengthens and weakens this relationship.

There may be factors within the individual (e.g., self-efficacy and alcohol outcome expectancies), their perceptions of their peers (e.g., peer descriptive norms, injunctive norms, and popularity) and/or their relationship (e.g., stability, intimacy, and support) that may impact the degree to which drinkers are susceptible to drinking buddy influence. Understanding factors that attenuate or strengthen the influence of drinking buddies permit the opportunity to identify risk for harmful drinking and inform preventative programs. Thus, this study aimed to examine specific moderators of the drinking buddy-personal drinking relationship. Specifically, I sought to investigate the role of individual traits, peer traits, and traits of the relationship as moderators of alcohol consumption among college students.

Social Cognitive Theory

In order to better understand the association between peer drinking and individual drinking, several theoretical frameworks have provided guidance. Most notably, Bandura's social cognitive theory (SCT; 1986) is one of the most prominent and well-supported theories of social behavior, and has been applied extensively in studies examining alcohol outcomes (Brooks et al., 2019; Gilles et al., 2006; Hasking et al., 2015). While SCT is conceptually similar to the widely popular Social Learning Theory (Bandura, 1977), SCT differs in that it emphasizes an individual's cognitive factors in the observation and reproduction of behavior (Bandura, 1986). According to SCT, human behavior is the result of a complex interplay between personal (e.g., cognitive), environmental (e.g., peer influence), and behavioral elements (Bandura, 1986). These factors are suggested to interact with one another and influence an individual's behavior, which, in turn, influences an individual's environment, and so forth. For instance, an individual may have a lot of drinking peers and may feel unable to refuse alcohol offers; these elements combined may increase their likelihood to drink. In turn, due to their drinking, this individual

may also select peers who drink, and refuse alcohol offers less frequently, which serve to reinforce the cycle.

SCT is composed of six main components that are posited to influence behavior. First, *reciprocal determinism* references how characteristics of the individual and the environment interact to create changes in behavior. Second, *behavioral capability* defines an individual's ability to complete something using their knowledge and skills. Third, *observational learning* defines the process by which individuals observe others' behaviors and reproduce them. Fourth, *reinforcements* reference an individual's internal and external reactions to others that make a behavior more or less likely to occur in the future. *Expectancies* are an individual's beliefs regarding the positive or negative outcomes of their behavior. Finally, *self-efficacy* references one's beliefs regarding their ability to successfully complete something. Of particular interest are the latter two constructs, which describe an individual's social cognitions and emphasize the interplay between individual cognitions and social interaction in behavioral outcomes.

Bandura's influential theory has been extensively applied to a range of health risk behaviors, including eating behaviors (Ball et al., 2009; Lubans et al., 2012), condom use (O'Leary et al., 1992; Yang et al., 2016), substance use (Alexander & Ward, 2018; Greer et al., 2022; Gullo et al., 2017), and a variety of alcohol outcomes (Burke & Stephens, 1999; Dijkstra et al., 2001; Hasking et al., 2015). Most importantly, the SCT framework has been utilized to predict drinking behavior as it relates to peer relationships (Jang et al., 2012; Varela & Pritchard, 2011), suggesting that SCT provides a strong theoretical foundation for understanding peer effects on alcohol consumption. However, to better understand how peers exert influence on drinking, it is important to first understand how important peer groups are formed.

Selection and Socialization

In general, young adults are shown to have similar patterns of drinking as their peer groups (Barnett et al., 2014; Overbeek et al., 2011). One way to explain this association is to look at processes of socialization and selection (Burk et al., 2012). As described by the SCT principal of reciprocal determinism, individuals observe and imitate others' behaviors, while also modeling behaviors to others. Thus, the similarity between an individual's drinking and their peer's drinking may be explained by active selection of a peer group that had similar drinking habits to one's own (i.e., selection). Alternatively, similar patterns of alcohol consumption between an individual and their peer could be the result of social influences on an individual's behavior (i.e., socialization). When it comes to predicting and explaining drinking behavior, evidence suggests that mechanisms of both selection and socialization are at play (Becker & Curry, 2014; Burk et al., 2012; Kiuru et al., 2010).

While results have been mixed on which force tends to be more salient on drinking behavior, some studies point to socialization of alcohol consumption being particularly prominent. One study by Fite and colleagues (2006) found using a longitudinal design that associating with deviant peers was predictive of early initiation of alcohol use in adolescents, supporting the effects of socialization, but not selection. Socialization effects may be especially prominent in the case of college students, who are socialized into a unique culture upon entering college that considers alcohol consumption an integral part of the college experience (Tan, 2012). For example, drinking behaviors that are disproportionately observed in college samples, such as binge drinking (Schulenberg et al., 2021) and drinking games (Adams & Nagoshi, 1999; Borsari, 2004) have been attributed to the socialization that occurs in college environments (Tan, 2012), and this effect has been observed even when accounting for selection effects (McCabe et al., 2005; Park et al., 2008). Understanding the socialization of college student drinking provides

us with an opportunity to develop intervention strategies that target the modeling of harmful drinking practices in college environments. Consequently, the evident socialization of alcohol consumption in college student samples warrants further investigation.

Perceived Peer Relationships

As described by SCT, interactions between individuals and their peers can result in significant changes in behavior. Indeed, peers have been well-documented as a strong predictor of individual drinking outcomes (Leung et al., 2014), particularly in college student populations (Borsari & Carey, 2001). One explanation for this phenomenon are social norms surrounding drinking in college. Social norms are beliefs about the behaviors and attitudes of others (Cialdini et al., 1990). In the drinking literature, norms can relate to drinking behavior (e.g., how much a peer drinks), or to drinking attitudes (e.g., how permissible it is to get drunk). These norms (i.e., perceptions) have been heavily utilized in alcohol research to predict individual drinking. For example, perceptions of peer drinking have shown to significantly predict quantity of individual drinking (Cox et al., 2019; Kenney et al., 2017; Lee et al., 2021; Perkins, 2007), frequency of individual drinking (Perkins, 2007; Russell et al., 2020), and alcohol-related problems (Lau-Barraco & Collins, 2011; Song et al., 2012; Ward & Guo, 2020). Furthermore, specific to one's close peers, evidence has found that perceptions of drinking behavior and actual drinking behavior are closely matched (Kenney et al., 2017; Mason et al., 2019), suggesting that perceptions of peer behavior can be highly accurate. Consequently, perceptions of peer drinking may play a key role in understanding individual alcohol consumption.

Drinking Buddies

Evidence suggests that a specific subgroup of individuals in one's social network may be particularly influential in the promotion of harmful drinking. Research has identified a specific

subset of individuals, known as *drinking buddies*, who explain unique variance in individual alcohol consumption, above and beyond drinkers in one's network alone (Leonard & Mudar, 2003; Reifman et al., 2006). Drinking buddies are individuals in one's social network that an individual identifies as someone they interact with regularly to engage in activities that revolve around drinking (Leonard et al., 2000). While drinking buddies are traditionally identified via self-report (i.e., "is this person a drinking buddy?"; Leonard et al., 2000; Reifman et al., 2006), some researchers have utilized the question "who are the people you drink alcohol with?" (Yang et al., 2013), and others have independently conceptualized drinking buddies as simply two peers who endorse drinking together (Kehayes et al., 2021). Despite these slight variations, the construct of drinking buddies appears to identify those with whom one actually drinks *with*, rather than simply drinkers in one's network. As a result, drinking buddies may be prominent sources of social influence. Prior work supports this idea, as the proportion of drinking buddies in one's social network has been associated with heavier drinking (Leonard et al., 2000, Reifman et al., 2006) and increased risk for alcohol-related problems (Lau-Barraco & Linden, 2014; Leonard & Homish, 2008). In fact, Reifman and colleagues (2006) found that the proportion of drinking buddies in one's social network longitudinally predicted harmful drinking, even after controlling for baseline social network drinking. To further elucidate the impact of drinking buddies, one study indicated that while moderate drinkers reported 30% of their social network was composed of drinking buddies, heavy drinkers reported that up to 70% of their network consisted of drinking buddies (Leonard & Homish, 2008). Evidently, the presence and proportion of drinking buddies in one's network is of particular concern.

Despite their apparent role on individual drinking, little is known regarding what makes drinking buddies so impactful. Descriptively, research has found that drinking buddies have been

described as moderate social drinkers (Lau-Barraco & Linden, 2014) who are motivated to drink for enhancement, social, and coping motives (Kehayes et al., 2021). Lau-Barraco & Linden (2014) reported cross-sectional findings that 76% of drinking buddies in one's network are peers, 72% of respondents reported feeling very close to their drinking buddy, and 63% reported their drinking buddy was available for concrete social support. Thus, research on the characteristics of drinking buddies supports that drinking buddies tend to be moderate drinking peers, adding to our conceptualization of drinking buddies and their subsequent influence.

Of note, much of the research on drinking buddies aligns with existing knowledge about heavy drinking peers. For example, similar to what has been found with heavy drinking peers, a greater proportion of drinking buddies in one's network has been found to predict individual perceptions of how much one's peers drink (i.e., descriptive norms; Lau-Barraco & Collins, 2011). Despite potential similarities, drinking buddies have shown to exert unique influence—above and beyond drinking peers alone (Leonard & Mudar, 2003; Reifman et al., 2006). One possible explanation for this is the unique role that drinking buddies hold in one's social network. Unlike other members of one's network, drinking buddy relationships are defined by drinking alcohol *together*. As such, drinking buddies may be the primary source of direct peer modeling of drinking, strengthening the association between drinking buddies in one's network and individual alcohol outcomes. Despite their theoretical importance, the body of literature on drinking buddies is limited, warranting further investigation.

Conditional Effects of Peer and Personal Drinking Associations

While the SCT framework is helpful in understanding the processes of social influence, it neglects to address the salience of certain factors over others when it comes to influencing behavior. Social influence network theory (Friedkin & Johnsen, 2011) posits that individuals

have differential susceptibilities to social influence. In essence, certain individuals may be intrinsically more or less likely to be influenced by a social model. Indeed, individual characteristics, ranging from demographics to behavioral characteristics, have been linked to susceptibility to peer influence (Brechwald & Prinstein, 2011; Leatherdale et al., 2005). For example, an individual who believes alcohol enhances their social abilities may be more comfortable modeling harmful drinking behaviors to a crowd, such as participating in drinking games (Van Tyne et al., 2012). Similarly, an individual who believes they are unable to control their drinking may be more likely to drink if they witness their peers drinking (Foster et al., 2014). Consequently, investigating conditional effects of peer influence is necessary to broaden our understanding of the complex mechanisms of social influence.

One way that conditional effects of social influence have been incorporated in interpersonal research is the Social Relations Model (Kenny & La Voie, 1984). This model posits that behavior within dyadic relationships can be understood by looking at three unique, yet interacting, components: the perceiver, the target, and the relationship. In effect, relations between two individuals can be described by looking at qualities of the perceiver (e.g., the individual), the target (e.g., their peer), and the relationship. While the Social Relations Model has not been used to investigate drinking peers specifically, it has been applied in investigating perceptions of one or both individuals within a dyadic pair, including peers (Greguras et al., 2001; Jorgensen et al., 2018; van den Berg & Cillessen, 2015), parents and children (Coesens et al., 2010; Cook & Kenney, 2004), and romantic couples (Serewicz, 2008). In general, these applications of the Social Relations Model suggest that examining the role of relationships on behavioral outcomes requires investigating the individual's influence, their counterpart's influence, and the influence of their relationship. When applied to drinking peers, this model

highlights the importance of evaluating these three components (i.e., the individual, the peer, and their relationship) to predict drinking behavior more accurately.

Individual Characteristics

Drinking research has identified that certain individuals may be more susceptible to peer effects than others (Allen et al., 2006; DeLay et al., 2022; Oyibo & Vassileva, 2019; Urberg et al., 2003), and that this susceptibility is associated with increased alcohol consumption (DeLay et al., 2022; Flannery et al., 1994). In an attempt to understand individual vulnerability to alcohol-related influence, certain individual traits have been examined, including autonomy (Fuligni & Eccles, 1993; Bamaca & Umana-Taylor, 2006) impulsivity (Vitulano et al., 2009), self-control (Trucco et al., 2011; Visser et al., 2013; Wills et al., 2011), and social skills (Allen et al., 2012). However, a large majority of this research has been conducted with adolescent populations, and findings have been mixed, indicating that a cohesive explanation for which traits make one particularly susceptible to peer effects is lacking.

SCT can be deconstructed into several social and cognitive components. The two cognitive components of SCT—self-efficacy and expectancies—may serve to explain individual susceptibility to peer influence. Under SCT, an individual's beliefs regarding their level of self-efficacy may, in turn, make them more or less vulnerable to exhibiting certain behaviors. Indeed, low self-efficacy has been linked to increased susceptibility for external influence (i.e., social influence) on alcohol outcomes (Bandura et al., 2003; Ilgen et al., 2006). A specific subset of self-efficacy is drinking refusal self-efficacy (DRSE), which refers to an individual's beliefs regarding their capacity to refuse alcoholic beverages (Oei & Morawska, 2004). An individual's perception that they are unable to refuse alcoholic beverages may make them more susceptible to behaving in such a manner. DRSE is known as a strong predictor of drinking outcomes,

including alcohol consumption (Foster et al., 2014; Oei & Jardim, 2007) and alcohol-related consequences (Ehret et al., 2013; Kenney et al., 2014). Although DRSE has been associated with peer influence in some studies on adolescent populations (Jang et al., 2012), insufficient research has been conducted on the interplay between DRSE and peer influence in college populations.

The other cognitive component of SCT, expectancies (e.g., one's beliefs surrounding the outcomes of a behavior; Bandura, 1986) may also serve to explain individual susceptibility to peer influence. Both positive alcohol outcome expectancies (e.g., social confidence) and negative alcohol outcome expectancies (e.g., lack of control) have been reliably associated with alcohol consumption (Leigh & Stacy, 2004; Oei & Morawska, 2004). However, research has indicated that positive alcohol expectancies have a more robust effect on alcohol outcomes compared to negative expectancies (Leigh & Stacy, 1993), suggesting that positive alcohol expectancies may be of particular interest. Specific to drinking buddies, one study by Lau-Barraco & colleagues (2012) found that self-reported positive alcohol expectancies mediated the relationship between drinking buddies in one's network and individual alcohol outcomes. In addition, under the SCT framework, one's beliefs regarding the positive outcomes of alcohol may make one more vulnerable to the influence of peers. Peer influence has shown to be a salient factor in the formation of positive alcohol expectancies (Ting et al., 2015), Furthermore, Bartolo and colleagues (2022) demonstrated that peer pressure and motives to drink responsibly were inversely related, and this relationship was mediated by alcohol expectancies. These findings suggest that alcohol expectancies may not only be formed by peer influence—but expectancies may serve to bridge the link between peer alcohol use and individual alcohol use.

In summary, increased susceptibility to peer influence has been associated with increased alcohol outcomes. However, traits that may be associated with increased susceptibility to peer

influence have not been consistently demonstrated in college populations. Two individual-level factors posited by SCT, DRSE and alcohol outcome expectancies, have both been linked to drinking outcomes (Oei & Burrow, 2000; Oei & Morawska, 2004; Young et al., 2006). Thus, investigating the interplay between these constructs, individual drinking, and peer drinking is warranted.

Peer Characteristics

Perceived traits of one's peer may make a peer more or less influential on behavioral outcomes. Indeed, research has indicated that certain peers may have a greater magnitude of influence on individual behavior than other peers. Two constructs that are consistently linked to increased peer influence on individual behavior are peer social norms (Allen et al., 2005; Sasson & Mesch, 2014) and peer social status (Brechwald & Prinstein, 2011; Cohen & Prinstein, 2006). While they are unique constructs, peer norms and social status have found to be associated (Maheux et al., 2020). Specifically, popular peers have demonstrated to influence peer norms more than their less-popular counterparts (Brechwald & Prinstein, 2011). Research has further supported this, with evidence that perceived norms of popular peers are particularly influential on risky, deviant, and health-risk behavior (Dijkstra & Gest, 2015; Laninga-Wijnen et al., 2017; Maheux et al., 2020; Rancourt & Prinstein, 2010). However, the association between drinking norms and popularity, and their effects on individual drinking, is less understood.

Peer norms have been found to be a salient influence on behavioral outcomes (Maheux et al., 2020; Scalici & Schulz, 2017; Whitaker & Miller, 2000). Under the principles of SCT, perceptions of peer norms influence individual behavior, such that observations and interpretations of peer attitudes and behaviors may, in turn, cause an individual to imitate their peer. As such, an individual who believes their peers drink heavily may also drink heavily.

Research has supported this hypothesis—specific to alcohol, the link between perceptions of peer norms and drinking has been well-documented, including for outcomes such as drinking quantity (Gersh et al., 2019), binge drinking (DiGuiseppi et al., 2018), alcohol-related consequences (Buckner et al., 2011; Perkins et al., 2005), and even symptoms of alcohol dependence (Talley et al., 2014). Peer norms are commonly organized into two categories: *descriptive norms*, which refer to perceptions of how much one's peers drink, and *injunctive norms*, which refer to perceptions of how permissible one's peers are towards drinking behaviors (Borsari & Carey, 2003). Both injunctive and descriptive norms have shown to predict individual drinking behavior, regardless of *actual* peer norms (Borsari & Carey, 2003). This suggests that perceptions of peers' permissibility toward drinking and drinking behavior may be a salient factor in understanding what makes peers influential. However, given that high status peers have shown to disproportionately affect perceptions of norms, a closer investigation on the role of high-status peers on norms is warranted.

The role of high status peers on individual behavioral outcomes, including drinking (Allen et al., 2012; Dumas et al., 2014; Sweeting & Hunt, 2015) and other health-risk behaviors, such as smoking (Schaefer et al., 2013; Sweeting & Hunt, 2015), has been well-documented. One indicator of social status, popularity, has been associated with peer influence, particularly in the relationship between peer influence and drinking behavior. Research has demonstrated that peers that are perceived to be more popular by their peers have greater influence on individual alcohol outcomes than their less-popular counterparts (Allen et al., 2012; Dumas et al., 2018; Meisel et al., 2018). Theoretically, these observations fit well into the SCT framework, as high-status individuals model drinking behavior, and drinking is then imitated by their lower-status

peers. However, to understand the role of popularity as an indicator of status, it is important to clarify how it is typically defined.

In adolescent research, the construct of popularity has traditionally been defined using sociometric methodology. This method typically asks students a question (e.g., *name a popular peer*, or *name a peer who you would like to spend time with*), and an individual's level of popularity is calculated using the number of nominations they receive from peers (Cillessen & Rose, 2005). Current sociometric methods are helpful in the case of adolescent research, as adolescents have established classroom structures, allowing sociometric procedures to be an optimal method of defining popularity. Although less common, alternative ways of investigating perceptions of peer status rely on assessing egocentric (i.e., self-reported) perceptions of peer status. One such method of capturing perceived social status is the "ladder method", where participants are asked which rung of a ladder they (or a peer) land on relative to other peers in their grade, in which lower rungs indicate lower perceived social standing, and higher rungs suggest greater perceived social standing (Sweeting & Hunt, 2015). Another egocentric method of social status, known as the peer group status hierarchy task (Dumas et al., 2014a), asks individuals to rank members of a group on four elements indicative of social status. These sociometric and egocentric methods are restricted in that they can only assess perceptions of peers' social ranks compared to others within their established groups. The focus on well-defined groups is a problem, as it neglects to address perceptions of peer social status when one is not in an established group with a peer. For example, an individual may be friends with someone in their residence hall, but this dyad may not necessarily be a part of a larger social group. Despite this, individuals may still hold perceptions of their peer's general social standing compared to others. As a result, using self-report methodology to assess perceptions of a peer's global social

status, rather than within-group social status, would be beneficial in order to capture perceptions that may occur outside of established groups (i.e., within dyadic pairs).

While the role of high-status peers on behavior has been well-documented in grade school (Kwon & Lease, 2014; Lease et al., 2020) and adolescent (Brechwald & Prinstein, 2011; Teunissen et al., 2012) populations, insufficient research has been conducted on the role of perceptions of peer status on social influence in young adult and college populations specifically. Recent research has found that conceptions of popularity continue beyond adolescence and into young adulthood (Lansu et al., 2022; O'Mealey & Mayeaux, 2022), but notions of popularity may be somewhat different for young adults. Specifically, compared to adolescent conceptions of popularity, young adult conceptions of popularity may reference an individuals' likeability and prosocial behaviors more so than an individuals' social power. Thus, it appears that the role of status may look different amongst post-adolescent groups.

Despite the general lack of research on high-status peers and college student populations, several studies have examined the influence of high-status peers on individual drinking behavior amongst young adults. One study by Dumas et al. (2014b) used a naturalistic method of recruitment by approaching groups of young adults that were on their way to bar settings and interviewing them twice—once at baseline, and again prior to the end of their night. Findings indicated that individuals that had higher peer-reported social standings were more likely to encourage alcohol consumption (e.g., cheering them on, teasing them, purchasing alcohol) in their peers. Similarly, another study by Dumas and colleagues (2018) utilized longitudinal survey methodology to find that college students who were considered high-status within their peer group were more influential in encouraging their peers to drink than low-status peers were. Combined, these studies indicate that higher-status peers exhibit greater influence on

encouraging alcohol consumption. In addition, a study by Phua (2011) utilized social network analysis to investigate popularity in a small sample of fraternity members. Results showed that individuals high in sociometric popularity (i.e., peer-nominated popularity) exhibited greater drinking and smoking behavior compared to peers low in popularity. Similarly, a study by Meisel and colleagues (2018) demonstrated that having peers high in sociometric popularity was associated with greater individual drinking quantity. In other words, drinking with popular peers was associated with more individual drinking. Despite the limited research regarding the association between peer social status and drinking outcomes, indicators of status have been related to both peer influence and drinking behavior. As such, it is plausible that the effects of social status are relevant for understanding alcohol consumption in college student populations.

Relationship Characteristics

Another realm of research in understanding the association between peer alcohol consumption and individual alcohol consumption are characteristics of the relationship. Under SCT, an environmental factor that may result in differential impacts of peer influence may be the perceived quality of a peer relationship (Borsari & Carey, 2006). Indeed, research has suggested that high quality friendships may be particularly influential on health-risk behaviors, such as smoking and drinking (Urberg et al., 2003). Similarly, relationships with close peers and best friends, which tend to be characterized as higher quality (Demir et al., 2007), have been found to be more influential on personal alcohol consumption than other peers (Paek, 2009; Russell et al., 2021b; Yanovitzky et al., 2006). One potential explanation for high quality friendships being more influential is the role of modeling (Borsari & Carey, 2006). Under the SCT framework, if an individual perceives their peer to be an important and salient source of social support, they may spend more time together, and as a result, may be more susceptible to overt and/or passive

peer influences on drinking from their peer (Urberg et al., 2003). However, the directionality of these findings is not always consistent—some research suggests having high quality friendships serves as a protective factor against risky behavior (Kim et al., 2018; Poulin et al., 1999).

Perhaps one reason for the paradoxical findings on whether relationship quality serves as a protective factor or risk factor on alcohol outcomes is lack of consensus on the operational definition of relationship quality. For example, sets of constructs such as warmth and conflict (McCloskey & Stuewig, 2001), or trust, communication, and alienation (Pittman & Richmond, 2008) have all been used to uniquely define friendship quality in peer effects research. While these constructs may overlap and be theoretically related, failure to establish a stable definition of relationship quality may result in inconsistent findings. As a result, consistency regarding an operational definition may provide further insight into the function of relationship quality on behavioral outcomes.

Specific to investigating peer influences on drinking, one extant framework by Borsari & Carey (2006) posits that relationship quality is a combination of three factors: intimacy (i.e., the extent of personal closeness to their peer), stability (i.e., changes over time to one's social network), and support (i.e., degree to which an individual is accepted, loved, and involved in a relationship where communication is open). Indeed, greater perceived intimacy and support in a relationship has been found to be significantly associated with increased drinking outcomes (Lau-Barraco & Linden, 2014; Palmqvist & Santavirta, 2006). Additionally, perceived support appears to be a protective factor against risk for negative alcohol-related outcomes (Lau-Barraco & Linden, 2014). Findings on the relationship between stability and drinking outcomes are more mixed (Allen et al., 2006; Allen et al., 2012; Laursen et al., 2012; Schaefer et al., 2021), but this may be a result of different research methodology regarding collecting stability across studies

(e.g., duration of friendship versus changes in friendship). In summary, evidence exists to support Borsari & Carey's (2006) framework for relationship quality, yet these factors remain uninvestigated with regard to relationships with drinking buddies in one's social network.

Social Networks

Prior research on social network characteristics center around the use of two general methodologies. One common approach is *egocentric*, which target one's personal network, (Carrasco et al., 2008). Egocentric approaches require an individual to report on their social network members and characteristics, with analysis occurring at the individual level (e.g., an individual participant describes their network using self-report, and differences between individual participants are analyzed). Another approach is *sociometric,* which target an entire network of individuals (Rice & Yoshioka-Maxwell, 2015). This approach collects information from the individual and each member of their social network, resulting in measures of a relationship that come from both sets of individuals in it (e.g., every participant in a specified network completes measures regarding other members in the network, and relationships within the network are analyzed).

The specific social network assessment approach chosen in prior research has differed by the population of interest. Specifically, the sociometric approach has dominated the field of adolescent peer influence research (Child & Nind, 2013). One reason for the prominence of sociometric approaches in research on adolescents is because sociometric procedures provide rich data on established groups—and schools provide convenient sets of clusters (such as classrooms or grades) from which student responses can be connected. While the sociometric approach may be well-suited for adolescent populations, it is limited in that it excludes individuals that are outside of one's structured setting (Valente et al., 2004). For example, in

studying predictors of alcohol use, an adolescent's peer relationships outside of the classroom would be left out of analyses. Potentially influential peers may then fail to be considered. Moreover, compared to adolescents, it is possible that adult social networks consist of an array of individuals from diverse areas of one's life (e.g., work, school, church), making sociometric procedures that target a single influential group difficult to apply.

Investigating peer influences that are not associated with a cohesive group may be particularly relevant for college-aged populations. While some research has utilized sociometric procedures on cohesive groups in college samples, including residence halls (Barnett et al., 2014), fraternities (Phua, 2011), athletic teams (Yang & Tang, 2004), and clubs (Eveland & Kleinman, 2013), focusing on a single group of individuals may be insufficient to accurately understand the most influential members of one's network. Peers may be acquired in a variety of settings, including residence halls, sororities and fraternities, and extracurricular events. Consequently, despite the benefits of sociometric procedures, methodology capturing all influential peers in an individual's network may be more appropriate.

One benefit of egocentric approaches is the opportunity to gather information about the most important peer members of one's social network, and report on personal behavior as well as peer behavior. One common method of assessing egocentric social networks is the Social Network Map (SNM; Tracy & Whittaker, 1990). This methodology asks individuals to name up to 10 or 15 people in their social network and indicate which area of life they pertain to (e.g., household, work/school, organizations, etc.). Respondents then provide additional details about each friendship. In alcohol research, a common modification of the SNM incorporates questions regarding a social network member's alcohol use. For example, respondents may be asked to categorize their network member's drinking pattern over the last year (e.g., nondrinker, light

social drinker, moderate social drinker, etc.; Lau-Barraco et al., 2022; Lau-Barraco & Linden, 2014; Leonard et al., 2000; Reifman et al., 2006). In drinking buddy research specifically, subjects are also asked if the person in their network is considered a "drinking buddy" (Lau Barraco et al., 2021; Lau-Barraco & Linden, 2014, Leonard et al., 2000; Reifman et al., 2006). As a result, perceptions of each network member and their subsequent alcohol consumption can be obtained. This modification shows significant promise as a tool in capturing egocentric social network data as it pertains to alcohol use. Specifically, this approach can be further modified to collect additional data regarding potentially relevant characteristics (e.g., popularity) of each peer in one's network, as well as characteristics (e.g., quality) of the peer relationship.

The Current Study

College students are at-risk for heavy drinking and alcohol-related consequences (Schulenberg et al., 2021). Guided by SCT (Bandura, 1986), one factor that may explain this is peer influence. Peers are influential on a variety of health-risk outcomes, including drinking. One subset of peers, known as drinking buddies, have shown to be particularly influential on drinking outcomes (Reifman et al., 2006). Research has consistently indicated that having a greater proportion of drinking buddies in one's social network is associated with both heavier individual drinking and greater individual drinking consequences (Lau-Barraco & Linden, 2014; Leonard & Homish, 2008; Leonard et al., 2000; Reifman et al., 2006). Moreover, evidence suggests that the number of drinking buddies in one's network longitudinally predicts greater alcohol outcomes, even when accounting for baseline network drinking (Reifman et al., 2006). While it is evident that drinking buddies exert a significant influence on individual alcohol outcomes, little is known regarding how and under what conditions drinking buddies are more or less influential. Research suggests that certain individuals are generally more susceptible than others to peer influence

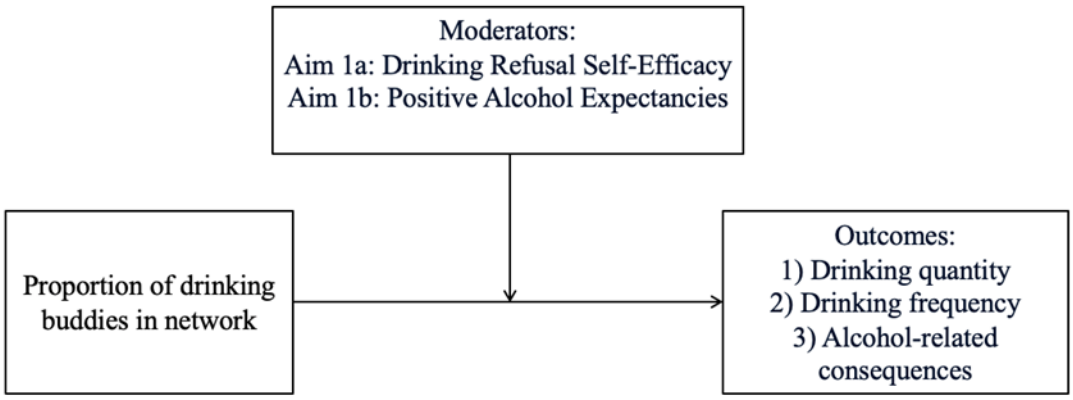
(Oyibo & Vassileva, 2019). In an attempt to understand what makes peer effects more influential in some contexts compared to others, the Social Relations Model (Kenny & La Voie, 1984) posits three relevant domains that serve to explain behavior associated with dyadic pairs: factors within the perceiver, the target, and their relationship. In other words, in the context of peer relationships, individual characteristics, peer characteristics, and relationship characteristics may serve to explain individual drinking behavior. Within the domain of *individual characteristics,* two social-cognitive factors posited by SCT, DRSE (Young et al., 2006) and alcohol outcome expectancies (Leigh & Stacy, 2004) may be associated with an individual's vulnerability to peer influence. Within the domain of *peer characteristics*, perceptions of peer behavior and attitudes, as well as perceptions of peer social rank, may be associated with increased alcohol outcomes. Specifically, peers' descriptive norms and injunctive norms regarding alcohol use have shown to relate to individual drinking outcomes (Borsari & Carey, 2003), but research extending these findings to drinking buddy populations is lacking. In addition, perceptions of one's peer social rank may be influential on drinking outcomes. Studies show that popularity, a common indicator of social status, may be associated with increased risk for drinking (Allen et al., 2012). However, this has been greatly understudied in college populations, and no research has examined these factors in relation to drinking buddy influence. Finally, in the domain of *relationship characteristics*, perceptions of a drinking buddy relationship may impact how influential a peer is. The quality of a peer relationship, defined by the constructs of intimacy, stability, and support (Borsari & Carey, 2007) may augment a drinking buddies' influence, although the directionality of this association is unclear. As such, the aims of this study are outlined below.

Aim 1: To investigate individual characteristics (i.e., drinking refusal self-efficacy and expectancies) as moderators of the positive relationship between the presence of

drinking buddies (i.e., proportion of drinking buddies in social network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences; see Figure 1).

Figure 1

Aim 1 Conceptual Model



SCT (Bandura, 1986) posits that the extent of a peer network's influence on individual behavior is a unique interaction between individual traits and socio-environmental factors. Within this framework, several individual traits are posited to associate with both social learning and drinking behavior. Of particular importance are self-efficacy and expectancies, both of which have been shown to be strongly associated with drinking outcomes. Self-efficacy refers to one's level of confidence in one's ability to successfully complete a behavior (LaMorte, 2019). SCT argues that individuals and peers reciprocally model self-efficacious behaviors to one another—which in turn affects one's own perceptions of self-efficacy. Self-efficacy has been shown to be related to both peer influence (Schunk & Pajares, 2002), and drinking behavior

(Engels et al., 2005; Giles et al., 2006). A particular subtype of self-efficacy, drinking refusal self-efficacy (DRSE), has shown to be strongly associated with individual drinking outcomes (Ehret et al., 2013; Oei & Jardim, 2007; Young et al., 2006). Compared to general self-efficacy, DRSE is unique in that it assesses self-perceptions related to one's ability to restrain from drinking, including in social settings. However, the role of DRSE on drinking outcomes in context of drinking buddy relationships has not yet been assessed.

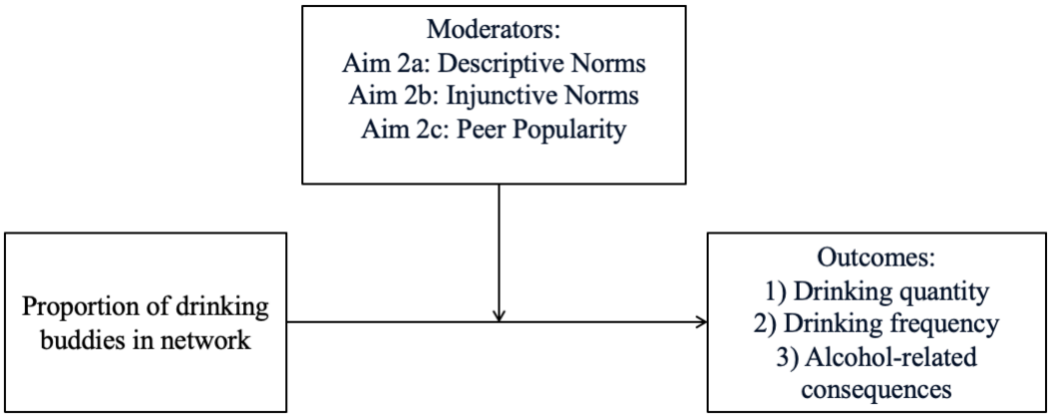
***Hypothesis 1a*:** Drinking refusal self-efficacy (i.e., DRSEQ-R scores) will moderate the positive association between presence of drinking buddies in one's network (i.e., proportion of drinking buddies in network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences), such that lower ratings DRSE will strengthen this association.

Another construct highlighted in SCT is expectancies—or one's beliefs surrounding how positive or negative the consequences of an action may be. Research has consistently supported that reporting positive social expectancies regarding drinking contexts is associated with increased alcohol consumption (Lee et al., 1999). Expectancies have also been associated with social influence, (Lau-Barraco et al., 2012; Olthuis et al., 2011). Subsequently, it is possible that the relationship between one's drinking and one's drinking buddy drinking becomes strengthened as an individual's social expectancies are stronger.

***Hypothesis 1b*:** Positive alcohol expectancies (i.e., AOES scores) will moderate the positive association between the presence of drinking buddies in one's network (i.e., proportion of drinking buddies in network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences), such that stronger positive drinking expectancies will strengthen this association.

Aim 2: To investigate perceived peer characteristics (i.e., descriptive norms, injunctive norms, and popularity) as moderators of the positive relationship between presence of drinking buddies (i.e., the proportion of drinking buddies in one's network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences; see Figure 2).

Figure 2
Aim 2 Conceptual Model



Research on peer influence has suggested that one's perception of their peer's social status may affect the magnitude of the peer's influence (Allen et al., 2012; Cohen & Prinstein, 2006; Laursen et al., 2012). SCT (Bandura, 1986) posits that peers model behaviors and attitudes, which in turn become imitated by the perceivers. Research supports this argument—perceptions of how peers drink (descriptive norms) and how permissible they are towards drinking (injunctive norms) have both been shown to influence individual drinking (Borsari &

Carey, 2003). Despite their salience in predicting individual drinking outcomes, insufficient research has been completed in the domain of drinking buddies specifically.

Hypothesis 2a: Descriptive norms (i.e., DNRF scores) will moderate the positive association between the presence of drinking buddies in one's network (i.e., proportion of drinking buddies in network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences), such that greater perceptions of peer alcohol use will strengthen this association.

Hypothesis 2b: Injunctive norms (i.e., Alcohol Use Injunctive Norms scores) will moderate the positive association between the presence of drinking buddies in one's network (i.e., proportion of drinking buddies in network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences), such that stronger perceptions of peer permissibility towards alcohol use will strengthen this association.

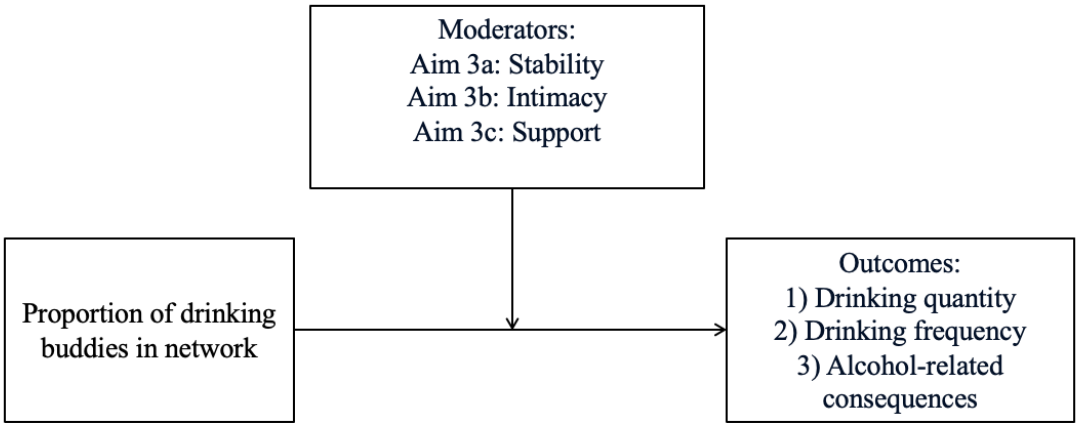
Peer social status may be another relevant factor in understanding peer influence on individual alcohol outcomes. Under SCT, high status peers model behavior and attitudes to others, which are then observed and replicated by others. One specific indicator of social status, popularity, has shown to be relevant in behavioral outcomes—including drinking (Allen et al., 2012; Dumas et al., 2014; Sweeting & Hunt, 2015). Although peer popularity has been associated with individual drinking, few studies have examined this relationship in college populations. In addition, no research exists on this relationship in the context of drinking buddies specifically. Thus, this aim targets how one's perception of the drinking buddy's popularity influences individual alcohol outcomes.

Hypothesis 2c: Popularity (i.e., scores on the PAPS Peer Popularity subscale) will moderate the positive association between the presence of drinking buddies in one's network (i.e., proportion of drinking buddies in network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences), such that greater perceived popularity of one's drinking buddies will strengthen this association.

Aim 3: To investigate perceived qualities of the relationship (i.e., stability, intimacy, and support) as moderators of the positive relationship between the presence of drinking buddies (i.e., proportion of drinking buddies in network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences; see Figure 3).

Figure 3

Aim 3 Conceptual Model



Facets of one's peer relationship may influence drinking behavior. Indeed, high quality peer relationships have been associated with alcohol outcomes. (Laursen et al., 2012; Palmqvist & Santavirta, 2006; Urberg et al., 2003). However, findings on the directionality of the association between peer relationships and alcohol outcomes are mixed. Borsari & Carey's (2006) extensive review on peer relationships and drinking identifies three defining components of the quality of a platonic relationship: stability, intimacy, and support. Within these components, stability refers to changes in one's peer network over time, intimacy is the extent one feels close to their peer, and support is the extent one feels accepted by, loved by, and open to communicate with their peer. Findings on relationship stability and peer influence on alcohol outcomes have been mixed—with some evidence suggesting greater relationship stability is associated with lower vulnerability to peer influence (Allen et al., 2006; Schaefer et al., 2021), and other evidence suggesting that more stable friendships are more influential on alcohol outcomes (Laursen et al., 2012). Alternatively, greater intimacy (Palmqvist & Santavirta., 2006) and greater perceived support (Wills et al., 2004) in a relationship have both been associated with greater drinking outcomes. Given the distinctive role drinking buddy relationships serve on alcohol outcomes, the purpose of this aim is to explore how the perceived quality of one's peer relationship predicts individual drinking outcomes.

Hypothesis 3a: Stability (i.e., duration of friendship in years) will moderate the positive association between the presence of drinking buddies in one's network (i.e., proportion of drinking buddies in network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences), such that greater perceived stability of drinking buddy relationships will strengthen this association.

Hypothesis 3b: Intimacy (i.e., scores on the PAIR Emotional Intimacy scale) will moderate the positive association between the presence of drinking buddies in one's network (i.e., proportion of drinking buddies in network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences), such that greater perceived intimacy of drinking buddy relationships will strengthen this association.

Hypothesis 3c: Support (i.e., scores on the QRI Support scale) will moderate the positive association between the presence of drinking buddies in one's network (i.e., proportion of drinking buddies in network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences), such that greater perceived support from drinking buddy relationships will strengthen this association.

CHAPTER II

METHOD

Participants and Recruitment

Participants (*N*=130) were undergraduate students from Old Dominion University, recruited via a research platform (Sona) through the Psychology Department. Participant sex was 86.2% female, and participants were an average of 20.53 years old (*SD* = 1.78). Regarding racial identity, 54.6% (*n*=71) of participants were White, 38.5% (*n*=50) Black/African American, 8.5% (*n*=11) Asian, 3.8% (*n*=5) American Indian or Alaska Native, 1.5% (*n*=2) Middle Eastern/North African, 0.8% (*n*=1) Native Hawaiian/Pacific Islander, and 5.4% (*n*=7) "Other". See Table 1 for sample demographics.

Participants were compensated with psychology research credit in exchange for their participation in the study. To be eligible, participants had to be between ages 18 and 25 years and be current drinkers (i.e., report drinking at least one alcoholic beverage in the past 30 days). All procedures were reviewed by Old Dominion University's Institutional Review Board and followed current APA guidelines (APA, 2017).

Procedure

The current study utilized a cross-sectional, self-report survey methodology. Individuals accessing the study advertisement on Sona were linked to a brief screening survey to assess their eligibility for participation (i.e., between 18-25 and consumed at least one standard drink in past 30 days, Appendix A). If eligible, participants were provided with a more detailed description of the study (e.g., *the following survey will ask you about your drinking, your beliefs and attitudes about alcohol, and your friendships*). Qualtrics settings were enabled to prevent individuals with the same IP address to attempt the screener more than once. Next, participants provided informed

consent and were granted access to the primary survey. Upon completion of the survey, participants were linked to a separate survey to input identifying information (i.e., Sona ID) to receive compensation (Appendix B). The survey took between 30-45 minutes to complete.

Table 1

Demographics

Sample Characteristics	*n*	%	*M*	*SD*
Age			20.53	1.78
Sex				
Male	18	13.8		
Female	112	86.2		
Gender				
Male	18	13.8		
Female	107	82.3		
Non-binary/third gender/other	5	3.9		
Hispanic/Latino				
Yes	22	17.2		
No	106	82.8		
Racial Identity				
American Indian or Alaska Native	5	3.8		
Asian	11	8.5		
Black or African American	50	38.5		
Middle Eastern/North African	2	1.5		
Native Hawaiian/Pacific Islander	1	0.8		
White	71	54.6		
Other	7	5.4		

Measures

Demographics

Demographic information, including sex, race, and age was collected for each participant (Appendix C).

Individual Factors

Individual Alcohol Consumption. The Daily Drinking Questionnaire (DDQ; Collins et al., 1985; Appendix D) assesses daily drinking for a typical week across the last 3 months. Participants report on each day of the week (1) how many standard drinks they typically consume, and (2) typical duration of the drinking occasion. A standard drink was defined as one 12 oz beer (5% alc/vol), one 8-9 oz craft beer (~7% alc/vol), one 4-5oz glass of wine (~13% alc/vol), one 12 oz hard seltzer (5% alc/vol), one 1.5 oz 80 proof shot (40% alc/vol), and 1.5 oz liquor in mixed drink (40% alc/vol). Two indices of drinking were calculated using the DDQ: typical drinking quantity and typical drinking frequency. Scores for drinking quantity were calculated by summing up the total number of drinks reported in a typical week. Scores for drinking frequency were calculated by summing up the total number of days one reports consuming alcohol in a typical week. The DDQ has good test-retest reliability (r = .72, Collins et al., 1985), and demonstrates good convergent validity with other measures of college student drinking (Levitt et al., 2020; Lindgren et al., 2013).

Individual Alcohol Consequences. The Brief Young Adult Alcohol Consequences Questionnaire (B-YAACQ; Kahler et al., 2008; Appendix E) is a 24-item self-report measure that assesses for one's consequences resulting from alcohol consumption over the last 3 months. Items include consequences that span several domains in one's life, such as "I have had a hangover the morning after I had been drinking", "When drinking, I have done impulsive things

that I regretted later", and "I have neglected obligations to my family, work, or school because of drinking". Subjects were instructed to indicate either "*yes*" or "*no*" for each scenario to indicate whether that has happened to them in the last month. Scores were calculated by summing the total number of items endorsed, with higher scores indicating greater number of consequences endorsed. The B-YAACQ exhibits strong internal consistency (α = .84-.89; Kahler et al., 2008). In addition, the B-YAACQ is highly correlated with other measures of alcohol-related consequences (Verster et al., 2009). Internal consistency was strong for the current study (α = .90).

Drinking Refusal Self-Efficacy. The Drinking Refusal Self-Efficacy Questionnaire - Revised (DRSEQ-R; Oei et al., 2005; Appendix F) is a 31-item self-report measure assessing confidence in oneself to refuse alcohol in a variety of situations, such as "when I am angry", or "when I am on my way home from school". Subjects responded on a 6-point Likert scale, with responses ranging from 1 (*I am very sure I would drink*) to 6 (*I am sure I would not drink*). Scores were calculated by summing up the responses on each item. Low scores indicate low DRSE, and high scores suggest high DRSE. The DRSEQ-R has good internal consistency (α = .87-.94). In addition, the DRSEQ-R demonstrates strong construct and concurrent validity (Oei et al., 2005). The DRSEQ-R exhibited strong consistency in our study (α = .97).

Alcohol Outcome Expectancies. The Alcohol Outcome Expectancies Scale (AOES; Leigh & Stacy, 1993; Appendix G) is a 34-item measure assessing one's perception of positive and negative expected consequences of drinking. Participants were instructed to indicate how likely they believe certain things would happen to them when they drink alcohol on a scale from 1 (*no chance*) to 6 (*certain to happen*). Questions involve scenarios such as "I become aggressive" and "I am more accepted socially." The AOES items assess two broad constructs of

expectancies (i.e., positive expectancies and negative expectancies), as well as more specific subscales under each construct (i.e., social facilitation, fun, sex, and tension reduction for positive expectancies). Given that positive alcohol expectancies in particular have been strongly linked to greater alcohol outcomes (Patrick et al., 2010; Smit et al., 2018) only positive expectancies were examined for purposes of this study (i.e., only 19 of the 34 items) were included. The positive subscales within the AOES have demonstrated strong internal consistency (α = 0.92-94), discriminant validity (Goldman et al., 1997) and good predictive validity (Anthenian et al., 2017; Leigh & Stacy, 1993). Internal consistency was strong in the current study (α = .95).

Perceptions of Peer Factors

Social Network Map (SNM). Social network characteristics were assessed using a modified Social Network Map (SNM; Tracy & Whittaker, 1990; Appendix H). The SNM asks an individual to identify up to ten individuals that "have been most important to you in the past year". For the current study, the SNM inquired about solely individuals identified as peers in the network. For each network peer identified, participants provided information about: (1) basic demographics (e.g., the individual's sex, age, and educational level), (2) the area of one's life the identified individual belongs to (e.g., household, work, school, etc.), (3) perceptions of their peer's popularity, (4) how many years the participant has known the identified individual (i.e., stability of the relationship), (5) perceptions of emotional intimacy in the relationship (see below), (6) perceptions of social support in the relationship (see below), (6) whether their peer drinks, (7) how frequently their peer drinks (on a 5-point scale, where 1 = *no drinking at all* and 5 = *problem drinker*), (8) how frequently the participant drank with this peer on average, over the last year, in a typical 30 day period (ranging from 0 to 30 days), (9) their peer's drinking quantity

(i.e., descriptive norms; see below), and (10) their peer's permissibility towards drinking (i.e., injunctive norms; see below). SNM data were utilized to calculate proportion of drinking buddies in one's network, which was defined as the number of drinking buddies divided by the total number of individuals in the network. The SNM has been used in several other studies assessing social network drinking (Bachrach & Read, 2017; Tracy & Johnson, 2007) and drinking buddies (Lau-Barraco et al, 2021; Lau-Barraco & Collins, 2011; Lau-Barraco & Linden, 2014).

Descriptive Norms. Descriptive norms of each peer were assessed using an adapted version of the Descriptive Norms Rating Form—Closest Friends (DNRF; Baer et al., 1991; Appendix I). Modeled after the DDQ (Collins et al., 1985), the DNRF asks individuals to report their estimates of their three closest peers' daily drinking for a typical week, averaged across the past three months. Using a 7-day calendar format, participants report how many standard drinks their peers typically consume. Standard drinks were defined (see DDQ). Scores on the DNRF were calculated by summing up the total number of drinks reported in a week. Individual scores are averaged across drinking buddies to create an average descriptive norm score, where higher scores indicate greater perceived descriptive norms for one's network of specific drinking buddies. For the current study, the DNRF was adapted to reference the specific peer, rather than the three closest peers.

Injunctive Norms. Injunctive norms of each peer were measured using an adapted version of the Alcohol Use Injunctive Norms—Closest Friends measure (AUIN; Baer, 1994; Appendix J). The AUIN instructs participants to rate how much their three closest friends would approve of four drinking scenarios (e.g., "drinking alcohol every weekend", "driving a car after drinking"). Participants rate each statement on a seven-point Likert scale, ranging from 1 (*strongly disapprove*) to 7 (*strongly approve*). Scores on the AUIN are calculated by summing

up responses on each item. Individual scores are averaged across drinking buddies to create an average injunctive norms score, where higher scores indicate greater perceived permissibility among one's network of drinking buddies. The AUIN was adapted to reference the specific peer, rather than the three closest peers.

Popularity. Popularity of each peer was assessed using the Peer Popularity subscale from the Personal Attributes Perceptions Scale (PAPS; Marks & Fraley, 2005; Appendix K). This measure was originally created for assessing popularity of individuals described in vignettes, but has been successfully adapted in several studies to assess perceptions of peer popularity (Marks & Fraley, 2005; Thomas & Hart, 2022; Zaikman et al., 2016). Because the Personal Attributes Perceptions Scale also assesses constructs that are unrelated to the current study (e.g., values, intelligence), the current study only used the Peer Popularity subscale. The Peer Popularity subscale consists of eight self-report items assessing the perceived popularity of an individual. Items include "This person is popular" and "This person has lots of friends". Participants rate their agreement with each statement on a Likert-type scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Scores are calculated by summing up the responses on each item, with the exception of item 8 ("No one likes this person"), which is reverse coded. Higher scores indicate stronger perceptions of peer popularity. Individual scores are averaged across drinking buddies to create an average popularity score, where higher scores indicate greater perceived popularity among one's network of drinking buddies. The Peer Popularity subscale exhibits a good internal consistency ($\alpha = .83$; Marks & Fraley, 2005).

Perceptions of Peer Relationship

Stability. While other sociometric procedures have measured stability longitudinally by interviewing subjects at two separate time points to see whether the relationship has remained

intact or not, this is not an appropriate method for this study, as data is collected during a single timepoint. Thus, peer relationship stability was measured using the reported length of the relationship in years. This method has been utilized to define relationship stability in other studies investigating peer relationships (Marton et al., 2015). In addition, longitudinal studies have suggested shorter friendships at timepoint one are associated with increased risk for friendship dissipation at timepoint two, indicating that the length of the relationship and stability of the relationship are interrelated (Forgeron et al., 2022). Tracy & Whittaker's (1990) Social Network Map includes a question titled "How long have you known this person?", with three options (e.g., *less than one year, 1-5 years*, or *more than 5 years*). For purposes of this study, a modified version of this question, "How long have you been friends with this person?", was used. In addition, to obtain more accurate responses and avoid artificial truncation of a continuous measure, the three response choices were expanded to a drop-down menu ranging from *less than one year, 1 year, 2 years*, and increasing by one year to the maximum, *25 or more years,* which is the age limit for participation in the study. Scores are aggregated across drinking buddies in one's network to create an overall "stability" score.

Intimacy. The Emotional Intimacy Scale (EIS) from the Personal Assessment Inventory of Relationships (PAIR; Schaefer & Olson, 1981; Appendix L) was used to measure relationship intimacy. This measure consists of six scales measuring intimacy—emotional, social, sexual, intellectual, and recreational. For purposes of this study, the Emotional scale was utilized to assess emotional intimacy, which most closely aligns with the construct of intimacy established by Borsari & Carey (2006). The EIS consists of six evaluative statements assessing perceptions of emotional intimacy in a relationship. Items include "This person listens to me when I need someone special to talk to", "I can state my feelings without him or her getting defensive", and

"I often feel distant from this person" (reverse coded). Subjects respond on a Likert-type scale ranging from 1 (*not at all true of our relationship*) to 5 (*very much true of our relationship)*. Three questions (items 3, 5, and 6) are reverse coded. Scores are calculated by summing up responses on each item, with higher scores indicating greater intimacy. Scores are aggregated across drinking buddies in one's network to create an overall "intimacy" score. The PAIR Emotional Intimacy Scale demonstrates good convergent and discriminant validity compared scales in similar measures (Schaefer & Olson, 1981). In addition, the scale demonstrates good internal consistency (α = .83-.89; Dandurand & Lafontaine, 2013; Jones & McCabe, 2011).

Support. Perceptions of peer social support were measured using the "Support" scale from the Quality of Relationships Inventory (QRI; Pierce et al. 1991; Appendix M). The QRI is a 25-item self-report questionnaire that has been validated as a measure for assessing quality of peer relationships (Yearwood Travezan et al., 2018). Because the QRI also assesses for constructs not relevant for purposes of this study (e.g., depth, conflict), only the Support scale was used. The QRI's Support scale (QRI-S) contains seven self-report items assessing perceptions of support within a target relationship. Respondents indicate their extent of agreement to evaluative statements (e.g., "To what extent could you count on this person for help with a problem?") on a 4-point scale ranging from 1 (*not at all*) to 4 (*very much*). Scores are calculated by taking the mean of items, where higher scores indicate greater perceived support. Scores are aggregated across drinking buddies in one's network to create an overall "support" score. The QRI's support scale has been utilized as an individual measure in other studies assessing perceptions of support in a relationship (Galliher et al., 2004; Turner et al., 2001; Weisz & Wood, 2005; Williams & Galliher, 2006; Yearwood et al., 2019), demonstrates

construct validity (Turner et al., 2001), and demonstrates good internal consistency (a = .82-.87; Weisz & Wood, 2005; Williams et al., 2006; Yearwood et al., 2019)

CHAPTER III

RESULTS

Analyses were conducted utilizing SPSS v28.0.1 and PROCESS (Hayes, 2012). To test the study aims 1, 2, and 3, linear regressions were conducted. Prior to analyses, data were cleaned and statistical assumptions were examined (see Data Preparation section below). For all analyses, the independent variable was the proportion of drinking buddies in one's social network, calculated as the number of identified drinking buddies in the SNM (Tracy & Whittaker, 1990), divided by the total number of peers in their network. Utilizing the proportion, rather than the number, of drinking buddies accounts for the number of peers listed on the SNM. The dependent variables were 1) individual drinking quantity (i.e., DDQ quantity scores), 2) individual drinking frequency (i.e., DDQ frequency scores), and 3) individual drinking consequences (i.e., BYAACQ scores). When assessing for consequences, drinking quantity was included as a covariate.

For aim 1, moderators were drinking refusal self-efficacy (i.e., DRSEQ-R scores) and positive alcohol expectancies (i.e., AOES scores). For aim 2, moderators were descriptive norms (i.e., DNRF scores), injunctive norms (i.e., AUIN scores), and popularity scores (i.e., PAPS Peer Popularity subscale scores). For aim 3, moderators were intimacy (i.e., EIS scores), stability (i.e., duration of friendship) and support (i.e., QRI-S scores). All moderators were calculated by averaging scores for peers identified as drinking buddies. As such, individuals with no social network members or no drinking buddies were removed from analyses (see Data Preparation section). Given that sex is predictive of drinking (Salvatore et al., 2017), sex was included as a covariate in all analyses. Sex was dummy coded, such that male = 0 and female = 1. Individuals who were intersex (n=2) or who did not report their sex were removed from analyses.

To test for moderation, PROCESS (Hayes, 2012) was used. Although a limitation of SPSS and PROCESS in general is that pairwise deletion is used to address missing data, there were no missing values for any of the variables used in our analysis. PROCESS was selected as it offers the Johnson-Neyman technique, which eliminates the need to select arbitrary values to test simple slopes, and instead probes moderations by determining the range of significance of a moderator (i.e., at what value(s) the moderator transitions from significant to non-significant). In other words, this output offers information on the strength of the moderation at multiple low, medium, and high values of the moderator. Significance of low values indicates that the moderator strengthens the association between the predictor and criterion at low values of the moderator. Significance of medium values indicates that the moderator strengthens the association between the predictor and criterion at medium values of the moderator. Finally, significance of high values indicates that the moderator strengthens the association between the predictor and criterion at high values of the moderator. Given that the Johnson-Neyman technique tested significance for a wide range of values of the moderator, rather than just low, medium, and high, the inflection point (i.e., point where values change from significant to non-significant or vice versa) is described and interpreted. Interaction terms were created between individual drinking and each moderator. Predictors and moderators were centered prior to creating the interaction term to reduce nonessential multicollinearity (i.e., multicollinearity that occurs from creating interactions with improperly scaled variables). PROCESS Model 1 (i.e., simple moderation) was utilized to test each moderator independently. Given that 24 analyses were conducted, the alpha of $\alpha = .05$ was divided by 24, resulting in an adjusted *p*-value of .0021. As such, statistical significance was determined based on this adjusted *p*-value.

Power Analysis

G*Power was utilized to estimate a sample size that would sufficiently power the study's aims. Based on .80 power and small-to-moderate effect size of $f^2 = .085$, 166 participants were needed to meet the minimum power criteria for the study. Given the lack of consistent research on moderators of drinking buddy drinking outcomes on individual drinking outcomes, a small-to-medium effect size was used to calculate the sample size. This estimate took into account that the largest model included three predictors and two covariates (see aims 2 and 3), and a Bonferroni-corrected alpha level of .0021.

Data Preparation

Before conducting analyses, data were cleaned and variables were recoded and aggregated. The collected sample consisted of 233 participants. Data were checked to remove individuals who failed more than two out of four attention checks, although no participants identified failed these criteria. In addition, individuals who did not endorse any peers in their network (n=23), did not endorse any drinking buddies (n=67), and/or did not complete details on named peers in one's network (n=13), were excluded from analyses. Data were examined for any missing values. Prior work has asserted that missingness below 5% is inconsequential (Schaefer, 1999). Given that the largest percentage of missing values across study variables was 1.6%, data was not imputed. Obtained data were checked for both univariate and multivariate outliers. To identify any univariate values falling beyond the accepted values, boxplots were utilized. Six extreme univariate outliers were identified: two for drinking quantity, and four for drinking frequency. Outliers were Winsorized to the next highest non-outlier value. Multivariate outliers were assessed by investigating leverage, discrepancy, and influence statistics. Leverage values were assessed by checking the Mahalonobis distance, discrepancy by checking the studentized

deleted residuals, and influence by checking Cook's D, and DFBETAs values for each analysis. Across all analyses, one significant multivariate outlier was identified and removed.

All multiple regression assumptions were assessed, including linearity, normality of residuals, independence of residuals, and homoscedasticity of residuals. Linearity was assessed visually by fitting a Lowess line to a scatterplot of the unstandardized residuals and predicted values. Normality was assessed visually by creating a histogram and a Q-Q plot. Data appeared to be normally distributed, with a slight positive skew. Independence of residuals was assessed using the Durbin-Watson statistic, as well as visually examining the distribution of the data in a scatterplot. All values were in the acceptable range. Lastly, homoscedasticity was assessed by running a regression with the predictors as the independent variable, and the standardized squared deleted residuals as the dependent variable.

Data Integrity

As with many online forms of data collection, survey methodology runs an increased risk of infiltration from bots (i.e., computer programs that are automated to complete specific tasks; Teitcher et al., 2015). Bots, which are frequently programmed and deployed to complete surveys for monetary compensation, are becoming increasingly more commonplace (Dennis et al., 2020; Griffin et al., 2022). As such, methods to prevent bot infiltration were implemented in this study. During survey collection, participants were required to register with their unique ODU email to prevent repeat participation and eliminate opportunity to utilize fraudulent emails. Length of time it took participants to complete the survey was analyzed to assess for outliers. In addition, attempts to retake the survey stemming from the same IP address were blocked by Qualtrics. No significant outliers were identified. Hidden questions were included utilizing JavaScript that were not be visible to participants, but would be visible to bots. No cases of responses to the

JavaScript questions were identified. Compensation was offered in the form of Sona credit, rather than monetary compensation. Lastly, Stata package "percentmatch" (Kuriakose, 2015) was used to identify cases that matched 85% or more with another case, as evidence suggests that this level of similarity would point to inauthentic data (Kuriakose & Robbins, 2015). No matching cases were identified.

Descriptive Findings

Descriptive findings on all study variables appear in Table 2 and Table 3. Across the sample, participants reported, on average, consuming 9.23 (*SD* = 8.08) drinks per week (e.g., drinking quantity), and 2.71(*SD* = 1.49) days per week (e.g., drinking frequency). In addition, 37.7% of individuals reported at binge drinking at least once a week, with an average number of 1.82 (*SD* = 1.20) binge drinking episodes per week. Participants reported an average of 6.08 (*SD* = 5.21) past month alcohol-related consequences. Bivariate correlations between all study variables can be found in Table 4. Proportion of drinking buddies in one's network was significantly correlated with binge drinking, *p*=.087.

Across all social network members, the average peer social network size was 7.27 (*SD* = 3.23). Peers in one's social network were, on average, 21.98 years old and 60.3% female. Peer network members fell mostly in the "friends" category (52.3%), followed by school (24.5%) and family (12.3%; see Table 2 for additional details on network composition). Participants knew their peers for an average length of 5.97 (*SD* = 3.93) years. Social network members were, on average, light to moderate social drinkers, and participants reported drinking with their social network members for an average of 4.05 (*SD* = 3.76) days over the past 30 days.

In examining drinking buddies exclusively, drinking buddies accounted for 49.2% of peer network members on average. Drinking buddies were, on average, 21.30 (*SD* = 3.90) years old

and 65.2% female. Participants knew their drinking buddies for an average of 5.41 (*SD* = 4.45) years. Drinking buddies were, on average, moderate social drinkers. Participants endorsed drinking with their drinking buddies for an average of 5.93 (*SD* = 5.10) days in the past 30 days.

Table 2

Descriptive Information on Social Network Variables

	Overall Network	Drinking Buddies
Variable	*M* / % (*SD)*	*M* / % (*SD)*
Network Size/Proportion	7.27 (3.23)	48.9%
Peer Age	21.98 (3.94)	21.3 (3.90)
Network Composition		
Friends	72.0%	72.8%
School	33.8%	38.2%
Family	16.9%	15.7%
Household	10.4%	12.3%
Organizations	9.7%	9.1%
Work	10.5%	9.1%
Neighbors	4.9%	4.2%
Professionals	0.7%	0.2%
Other	3.4%	3.2%

Note. Drinking quantity = individual drinking quantity. Drinking frequency = individual drinking frequency. Drinking consequences = individual drinking consequences. DBs = drinking buddies. Participants were allowed to select more than one life area for each network member, thus, cumulative network composition percentages may exceed 100%.

Table 3

Descriptive Information on Drinking and Individual, Peer and Relationship Factors

Variable	*M* / % (*SD)*
Individual Alcohol Outcomes	
Drinking Quantity	9.23 (8.08)
Drinking Frequency	2.71 (1.49)
Drinking Consequences	6.08 (5.21)
Individual Moderators	
DRSE	146.68 (33.13)
Positive Alcohol Expectancies	82.50 (17.83)
Peer Moderators	
Descriptive Norms	12.31 (10.17)
Injunctive Norms	12.07 (5.07)
Popularity	31.76 (5.32)
Relationship Moderators	
Intimacy	21.90 (6.08)
Stability	5.41 (4.45)
Support	20.23 (3.58)

Note. Proportion DB = proportion of drinking buddies in one's network out of all social network members. DRSE = individual drinking refusal self-efficacy. Descriptive norms = average DB descriptive norms. Injunctive norms = average DB injunctive norms. Popularity = average DB popularity. Stability = average length of DB relationship. Intimacy = average perceived intimacy in DB relationship. Support = average perceived support in DB relationship.

Table 4

Bivariate Correlation Matrix

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Proportion DB	-										
2. DRSE	-.033	-									
3. Expectancies	.160	.046	-								
4. Descriptive Norms	.029	-.235*	.072	-							
5. Injunctive Norms	-.079	-.139	.134	.585***	-						
6. Popularity	-.022	.237*	.292***	.005	.066	-					
7. Stability	.059	-.048	-.102	-.192	-.053	.188	-				
8. Intimacy	.118	.350***	.233*	-.219*	-.293***	.561***	.066	-			
9. Support	.107	.191*	.308***	-.172	-.130	.621***	.154	.712***	-		
10. Drk Quantity	.100	-.267**	.272**	.495***	.177	.066	-.237*	.016	-.025	-	
11. Drk Frequency	.035	-.343***	.207	.358***	.174	.042	.039	.048	.021	.678***	-
12. Drk Consequences	.148	-.361***	.216	.410***	.337***	-.163	-.175	-.223*	-.160	.437***	.357***

Note. Proportion DB = proportion of drinking buddies in one's network out of all social network members. DRSE = individual drinking refusal self-efficacy. Expectancies = individual positive alcohol outcome expectancies. Descriptive norms = average DB descriptive norms. Injunctive norms = average DB injunctive norms. Popularity = average DB popularity. Stability = average length of DB relationship. Intimacy = average perceived intimacy in DB relationship. Support = average perceived support in DB relationship. Drk quantity = individual drinking quantity. Drk frequency = individual drinking frequency. Drk consequences = individual drinking consequences.

*significant at $p<.01$

**significant at Bonferroni-correction $p<.0021$

***significant at $p<.001$

Testing Hypotheses

Testing Aim 1

The first aim of this study was to investigate the moderating effects of individual characteristics (i.e., drinking refusal self-efficacy, alcohol expectancies) on the relationship between presence of drinking buddies (i.e., proportion of drinking buddies in one's network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences). It was predicted that (1) drinking refusal self-efficacy (i.e., DRSEQ-R scores) would moderate the positive association between the proportion of drinking buddies in one's network and individual drinking outcomes, such that lower drinking refusal self-efficacy would strengthen this association, and (2) positive alcohol expectancies (i.e., AOES scores) would moderate the positive association between the proportion of drinking buddies in one's network and individual drinking outcomes, such that stronger positive drinking expectancies would strengthen this association. To test these hypotheses, six multiple linear regression models were conducted: three testing DRSE as a moderator and three testing AOES as a moderator. Due to multiple comparisons, the Bonferroni-corrected *p*-value of .0021 was utilized to determine significance. See Table 5 for regression statistics.

Hypothesis 1a

To test DRSE as a moderator of the association between proportion of drinking buddies in one's network and individual *drinking quantity*, 4 predictors were included in the model: proportion of drinking buddies in one's network (IV), DRSE (moderator), the interaction term between the IV and moderator, and sex (covariate). This model was not significant at our Bonferroni-corrected *p*-level, $F(4,121) = 3.40$, $p = .011$, accounting for 10.1% of variance in individual drinking quantity. The interaction between the proportion of drinking buddies in one's

network and DRSE was not significant, B = -.048, p = .625, suggesting that DRSE did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking quantity. The main effect of DRSE was significant at the $p < .001$ level.

To test this moderation with individual drinking frequency as the outcome, this model was replicated with *drinking frequency* as the criterion. This model was significant $F(4,121) = 5.59$, $p < .001$, and accounted for 15.6% of variance in individual drinking frequency. The interaction between the proportion of drinking buddies in one's network was not significant, B = -.027, p = .130, suggesting that DRSE did not significantly moderate the association between the proportion of drinking buddies in one's network and individual drinking frequency. A significant main effect emerged for DRSE at the $p < .001$ level.

To test DRSE as a moderator of the association between proportion of drinking buddies in one's network and *alcohol-related consequences*, 5 predictors were included in the model: proportion of drinking buddies in one's network (IV), DRSE (moderator), the interaction term between the IV and moderator, sex (covariate), and individual drinking quantity (covariate). This model was significant $F(5,120) = 11.23$, $p < .001$, accounting for 31.9% of variance in individual drinking consequences. There was no significant interaction between proportion of drinking buddies in one's network and DRSE scores, B = -.113, p = .038 when using the Bonferroni-corrected alpha of .0021, suggesting that DRSE did not moderate the relationship between the proportion of drinking buddies in one's network and individual drinking consequences. A main effect of DRSE emerged at the $p < .001$ level.

Hypothesis 1b

Positive alcohol outcome expectancies (i.e., AOES scores) were tested as a moderator of the association between proportion of drinking buddies in one's network and individual *drinking*

quantity. Four predictors were included in the model: proportion of drinking buddies in one's network (IV), AOES (moderator), the interaction term between the IV and moderator, and sex (covariate). This model was not significant, $F(4,121) = 2.95$, $p = .023$, accounting for 8.8% of variance in individual drinking quantity. The interaction between the proportion of drinking buddies in one's network and DRSE was not significant, $B = -0.10$, $p = .467$, indicating that alcohol outcome expectancy scores did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking quantity. A significant main effect of positive alcohol expectancies emerged ($p = .002$).

Positive alcohol outcome expectancies (i.e., AOES scores) were tested as a moderator with *drinking frequency* as the criterion. This model was not significant $F(4,121) = 1.56$, $p = .188$, accounting for only 4.9% of variance in individual drinking frequency. The interaction between the proportion of drinking buddies in one's network and DRSE was not significant, $B = -0.008$, $p = .756$, indicating that alcohol outcome expectancy scores did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking frequency. No significant main effects were observed for this model.

Positive alcohol outcome expectancies (i.e., AOES scores) were tested as a moderator with *alcohol-related consequences* as the criterion. Five predictors were included in the model: proportion of drinking buddies in one's network (IV), AOES scores (moderator), the interaction term between the IV and moderator, sex (covariate), and individual drinking quantity (covariate). This model was significant, $F(5,120) = 6.59$, $p < .001$, and accounted for 21.6% of variance in individual drinking consequences. The interaction between the proportion of drinking buddies in one's network and DRSE was not significant, $B = -0.06$, $p = .431$, indicating that alcohol outcome expectancy scores did not significantly moderate the association between proportion of

drinking buddies in one's network and individual drinking consequences. A significant main effect emerged for drinking quantity at the $p < .001$ level.

Table 5

Aim 1: Individual Traits Regression Statistics

	Drinking Refusal Self-Efficacy			Alcohol Outcome Expectancies		
Outcome	*B*	*SE*	*p*	*B*	*SE*	*p*
Quantity						
(Intercept)	9.55	1.90	.000*	11.34	1.88	.000*
Proportion DB	2.93	2.55	.251	1.38	2.58	.592
Moderator	-0.07	0.02	.001*	0.13	0.04	.002*
Prop. DB x Moderator	-0.11	0.09	.225	-0.10	0.13	.457
Sex	-0.41	2.01	.839	-2.36	2.02	.246
Frequency						
(Intercept)	2.66	0.33	.000*	2.98	0.35	.000*
Proportion DB	0.21	0.45	.646	-0.03	0.49	.950
Moderator	-0.02	0.01	.000*	0.02	0.01	.015
Prop. DB x Moderator	-0.03	0.02	.030	-0.01	0.03	.744
Sex	0.05	0.36	.896	-0.31	0.39	.416
Consequences						
(Intercept)	3.94	1.16	.001*	4.32	1.28	.001*
Proportion DB	2.32	1.45	.112	1.65	1.55	.288
Moderator	-0.05	0.01	.000*	0.03	0.03	.225
Prop. DB x Moderator	-0.13	0.05	.011	-0.08	0.08	.337
Sex	0.12	1.14	.915	-0.61	1.22	.617
Drinking Quantity	0.22	0.05	.000*	0.25	0.05	.000*

Note. DB = drinking buddy. Prop. DB = proportion of drinking buddies in network. Moderator refers to the main effect of the moderator in each column. *Significance determined at $p < .0021$.

Testing Aim 2

The second aim of this study was to investigate the moderating effects of perceived drinking buddy characteristics (i.e., descriptive norms, injunctive norms, and popularity) on the positive relationship between the presence of drinking buddies (i.e., proportion of drinking buddies in one's network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences). It was predicted that (1) descriptive norms (i.e., DNRF scores), (2) injunctive norms (i.e., AUIN scores), and (3) popularity (i.e., popularity scores) would moderate the positive association between the proportion of drinking buddies in one's network and individual drinking outcomes, such that greater perceptions of peer alcohol use, stronger perceptions of peer permissibility towards alcohol use, and greater perceived popularity of one's drinking buddies would strengthen the associations. Similar to aim 1, multiple linear regression models were conducted to test these analyses—three for each moderator. See Table 6 for regression statistics.

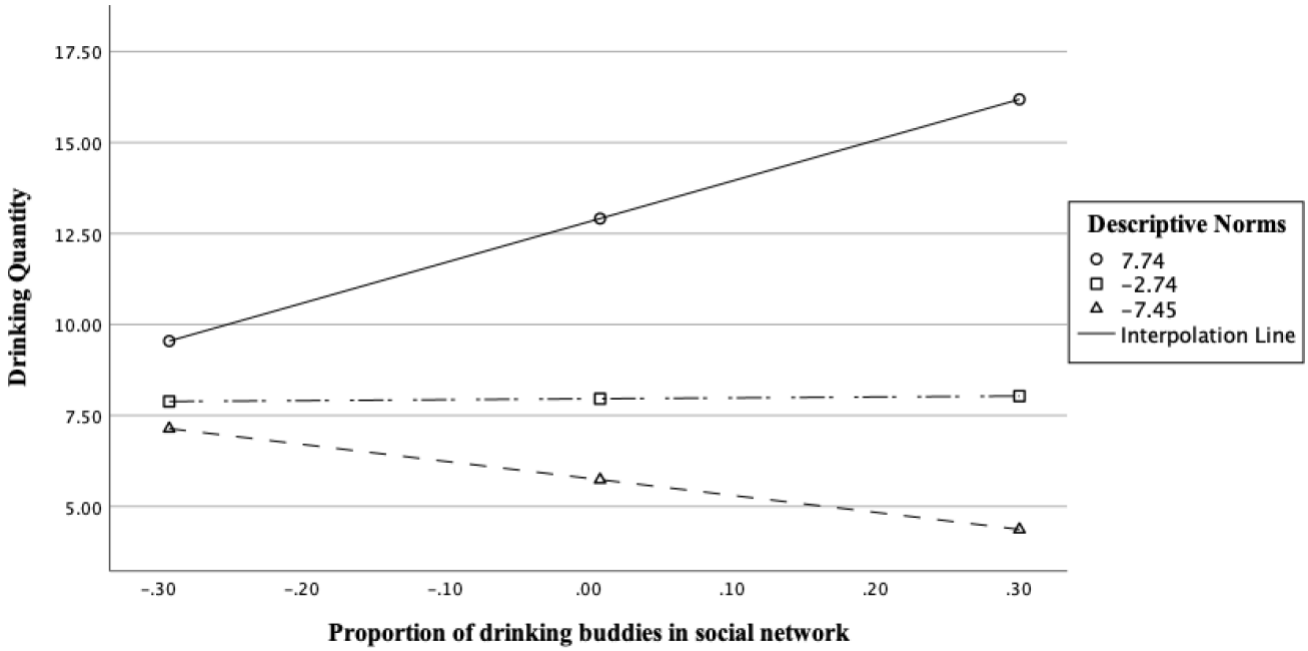
Hypothesis 2a

Descriptive norms (i.e., DNRF scores) were tested as a moderator between proportion of drinking buddies in one's network and individual *drinking quantity*. Four predictors were included in the model: proportion of drinking buddies in one's network (IV), DNRF scores (moderator), the interaction term between the IV and moderator, and sex (covariate). This model was significant $F(4,120) = 15.12$, $p < .001$, accounting for 33.5% of variance in individual drinking quantity. The interaction between the proportion of drinking buddies in one's network and DNRF scores was significant, $B = 1.05$, $p < .001$, suggesting that descriptive norms significantly moderated the association between proportion of drinking buddies in one's network and individual drinking quantity (Figure 4). Upon probing the interaction, the Johnson-Neyman

technique revealed the region of significance included scores between 9.13 to 32.45 points above the average DNRF score, suggesting that the moderation was significant at high levels of DNRF.

Figure 4

Descriptive Norms Moderation



Note. Descriptive norms are centered at the mean. On the legend, -2.74 represents the median value for descriptive norms; -7.74 and -7.45 reflect the 16th and 84th percentiles for descriptive norms, respectively.

Descriptive norms (i.e., DNRF scores) were tested as a moderator with individual *drinking frequency* as the criterion. This model was significant $F(4,120) = 6.12$, $p < .001$, and accounted for 17.0% of variance in individual drinking frequency. The interaction between the proportion of drinking buddies in one's network and DNRF scores was not significant, $B = .14$, $p = .019$ at the Bonferroni-corrected level, suggesting that descriptive norms did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking frequency. The main effect of DNRF was significant at the $p < .001$ level.

Descriptive norms (i.e., DNRF scores) were tested as a moderator with *alcohol-related consequences* as the criterion. Five predictors were included in the model: proportion of drinking buddies in one's network (IV), DNRF scores (moderator), the interaction term between the IV and moderator, sex (covariate), and individual drinking quantity (covariate). The model was significant $F(5,119) = 7.82$, $p < .001$, and accounted for 24.7% of variance in individual drinking consequences. The interaction between the proportion of drinking buddies in one's network and DNRF scores was not significant, $B = .09$, $p = .650$, indicating that descriptive norms did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking consequences.

Hypothesis 2b

Injunctive norms (i.e., AUIN scores) were examined as a moderator between proportion of drinking buddies in one's network and individual *drinking quantity*. Four predictors were included in the model: proportion of drinking buddies in one's network (IV), AUIN scores (moderator), the interaction term between the IV and moderator, and sex (covariate). This model was not significant $F(4,121) = 1.67$, $p = .162$, accounting for only 5.2% of variance in individual drinking quantity. The interaction between the proportion of drinking buddies in one's network

and AUIN scores was not significant, $B = .43$, $p = .355$, suggesting that injunctive norms did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking quantity. This model did not yield any significant main effects.

Injunctive norms (i.e., AUIN scores) were examined as a moderator with *drinking frequency* as the criterion. This model was not significant $F(4,121) = 1.09$, $p = .365$, accounting for only 3.5% of variance in individual drinking frequency. The interaction between the proportion of drinking buddies in one's network and AUIN scores was also not significant, $B = .04$, $p = .642$, suggesting that injunctive norms did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking frequency. No significant main effects were observed for this analysis.

Injunctive norms (i.e., AUIN scores) were examined as a moderator with *alcohol-related consequences* as the criterion. Five predictors were included in the model: proportion of drinking buddies in one's network (IV), AUIN scores (moderator), the interaction term between the IV and moderator, sex (covariate), and individual drinking quantity (covariate). The model was significant $F(5,12) = 9.31$, $p < .001$, and accounted for 28.0% of variance in individual drinking consequences. The interaction between the proportion of drinking buddies in one's network and AUIN scores was not significant, $B = .003$, $p = .991$, indicating that injunctive norms did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking consequences. However, both AUIN scores and drinking quantity emerged as significant main effects at the $p < .001$ level in this model.

Hypothesis 2c

Popularity (i.e., PAPS Peer Popularity scores) was tested as a moderator between the proportion of drinking buddies in one's network and individual *drinking quantity*. Four

predictors were included in the model: proportion of drinking buddies in one's network (IV), Peer Popularity scores (moderator), the interaction term between the IV and moderator, and sex (covariate). The model was not significant, $F(4,121) = 0.54$, $p = .705$, explaining only 1.8% of variance in individual drinking quantity. The interaction between the proportion of drinking buddies in one's network and popularity scores was not significant, $B = -0.13$, $p = .811$, suggesting that popularity did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking quantity. No significant main effects emerged for this model.

Popularity (i.e., PAPS Peer Popularity scores) was tested as a moderator with *drinking frequency* as the criterion. The model was not significant $F(4,121) = 0.77$, $p = .546$, accounting for only 2.5% of variance in individual drinking frequency. The interaction between the proportion of drinking buddies in one's network and popularity scores was also not significant, $B = -0.16$, $p = .113$, suggesting that popularity did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking frequency. No significant main effects were detected for this model.

Popularity (i.e., PAPS Peer Popularity scores) was tested as a moderator with *alcohol-related consequences* as the criterion. Five predictors were included in the model: proportion of drinking buddies in one's network (IV), Peer Popularity scores (moderator), the interaction term between the IV and moderator, sex (covariate), and individual drinking quantity (covariate). This model was significant $F(5,120) = 8.48$, $p < .001$, and accounted for 26.1% of variance in individual drinking consequences. The interaction between the proportion of drinking buddies in one's network and popularity scores was not significant at our Bonferroni-corrected *p*-level, $B = -0.59$, $p = .050$, indicating that popularity did not significantly moderate the association between

proportion of drinking buddies in one's network and individual drinking consequences. The main effect of drinking quantity was significant at $p < .001$.

Table 6

Aim 2: Peer Traits Regression Statistics

	Descriptive Norms			Injunctive Norms			Popularity		
Outcome	*B*	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*
Quantity									
(Intercept)	9.58	1.60	.000*	10.39	1.89	.000*	10.57	1.96	.000*
Proportion DB	3.42	2.20	.121	3.47	2.60	.184	3.13	2.74	.255
Moderator	0.45	0.06	.000*	0.31	0.14	.030	0.13	0.14	.352
Prop. DB x Moderator	1.03	0.28	.000*	0.41	0.45	.367	-0.14	0.53	.795
Sex	-0.46	1.73	.792	-1.29	2.04	.528	-1.55	2.11	.463
Frequency									
(Intercept)	2.74	0.33	.000*	2.86	0.35	.000*	2.85	0.36	.000*
Proportion DB	0.25	0.45	.584	0.27	0.48	.577	0.41	0.50	.414
Moderator	0.06	0.01	.000*	0.05	0.03	.041	0.02	0.03	.435
Prop. DB x Moderator	0.13	0.06	.020	0.04	0.08	.653	-0.16	0.10	.105
Sex	-0.05	0.36	.895	-0.17	0.38	.646	-0.17	0.39	.668
Consequences									
(Intercept)	4.81	1.24	.000*	4.44	1.19	.000*	3.15	1.22	.011
Proportion DB	2.24	1.51	.141	2.51	1.48	.092	2.83	1.54	.069
Moderator	0.15	0.05	.004	0.29	0.08	.000	-0.17	0.08	.034
Prop. DB x Moderator	0.11	0.20	.581	-0.02	0.25	.936	-0.63	0.30	.037
Sex	-0.39	1.18	.739	-0.66	1.16	.567	0.35	1.19	.766
Drinking Quantity	0.18	0.06	.005	0.24	0.05	.000*	0.28	0.05	.000*

Note. DB = drinking buddy. Prop. DB = proportion of drinking buddies in network. Moderator refers to the main effect of the moderator in each column. *Significance determined at $p < .0021$.

Testing Aim 3

The third aim of this study was to investigate the moderating effects of the perceived quality of a drinking buddy relationship (i.e., stability, intimacy, and support) on the positive relationship between the presence of drinking buddies (i.e., proportion of drinking buddies in one's network) and individual drinking outcomes (i.e., drinking quantity, drinking frequency, and alcohol-related consequences). It was predicted that (1) stability (i.e., duration of friendship) (2) intimacy (i.e., PAIR intimacy scores), and; (3) support (i.e., QRI Support scores) would moderate the positive association between the proportion of drinking buddies in one's network and individual drinking outcomes, such that greater perceptions of stability, intimacy, and support from drinking buddies would strengthen this association. Similar to prior aims, a multiple linear regression model was utilized, with three analyses conducted for each moderator. See Table 7 for regression statistics.

Hypothesis 3a

Stability (i.e., duration of friendship) was examined as a moderator between proportion of drinking buddies in one's network and individual *drinking quantity*. Four predictors were included in the model: proportion of drinking buddies in one's network (IV), friendship stability (moderator), the interaction term between the IV and moderator, and sex (covariate). This model was not significant at our Bonferroni-corrected *p*-level, $F(4,121) = 3.09$, $p = .018$, accounting for 9.3% of variance in individual drinking quantity. The interaction between the proportion of drinking buddies in one's network and stability was also not significant, $B = -1.39$, $p = .079$, suggesting that friendship stability did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking quantity. Stability emerged as a significant main effect for this model at $p = .002$.

Stability was examined as a moderator with individual *drinking frequency* as the criterion. This model was not significant $F(4,121) = 0.54$, $p = .708$, and accounted for 1.8% of variance in individual drinking frequency. The interaction between the proportion of drinking buddies in one's network and stability was significant, $B = -0.002$, $p = .962$, suggesting that friendship stability did not moderate the association between proportion of drinking buddies in one's network and individual drinking frequency. No significant main effects were noted for this analysis.

Stability was examined as a moderator with *alcohol-related consequences* as the criterion. Five predictors were included in the model: proportion of drinking buddies in one's network (IV), DRSE (moderator), the interaction term between the IV and moderator, sex (covariate), and individual drinking quantity (covariate). This model was significant $F(5,120) = 6.52$, $p < .001$, accounting for 21.1% of variance in individual drinking consequences. The interaction between proportion of drinking buddies in one's network and stability was not significant, $B = -0.18$, $p = .700$, indicating that friendship stability did not moderate the relationship between proportion of drinking buddies in one's network and individual drinking consequences. Drinking quantity was a significant main effect at the $p < .001$ level.

Hypothesis 3b

Intimacy (i.e., PAIR Intimacy scores) was examined as a moderator between proportion of drinking buddies in one's network and individual *drinking quantity*. Four predictors were included in the model: proportion of drinking buddies in one's network (IV), Emotional Intimacy Scale scores (moderator), the interaction term between the IV and moderator, and sex (covariate). This model was not significant $F(4,121) = 0.32$, $p = .861$, accounting for only 1.1% of variance in individual drinking quantity. The interaction between the proportion of drinking

buddies in one's network and intimacy was also non-significant, $B = 0.08$, $p = .874$, suggesting that friendship intimacy did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking quantity. No statistically significant main effects were observed for this model.

Intimacy was examined as a moderator with individual *drinking quantity* as the criterion. This model was not significant $F(4,121) = 0.32$, $p = .865$, and accounted for 1.0% of variance in individual drinking frequency. The interaction between the proportion of drinking buddies in one's network and intimacy was also not significant, $B = -0.08$, $p = .362$, suggesting that friendship intimacy did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking frequency. This analysis did not yield any significant main effects.

Intimacy was examined as a moderator with *alcohol-related consequences* as the criterion. Five predictors were included in the model: proportion of drinking buddies in one's network (IV), Emotional Intimacy Scale scores (moderator), the interaction term between the IV and moderator, sex (covariate), and individual drinking quantity (covariate). This model was significant $F(5,120) = 8.95$, $p < .001$, accounting for 27.2% of variance in individual drinking consequences. No significant interaction emerged between proportion of drinking buddies in one's network and intimacy, $B = -0.15$, $p = .557$, indicating that friendship intimacy did not moderate the relationship between proportion of drinking buddies in one's network and individual drinking consequences. This model revealed significant main effects at the $p < .001$ level for both intimacy and drinking quantity.

Hypothesis 3c

Support (i.e., QRI Support scores) was examined as a moderator between proportion of drinking buddies in one's network and individual *drinking quantity*. Four predictors were included in the model: proportion of drinking buddies in one's network (IV), QRI Support scores (moderator), the interaction term between the IV and moderator, and sex (covariate). The model was not significant $F(4,121) = 0.35$, $p = .842$, and accounted for 1.2% of variance in individual drinking quantity. The interaction between the proportion of drinking buddies in one's network and support scores was also not significant, $B = 0.24$, $p = .779$, suggesting that friendship support did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking quantity. No significant main effects emerged in this model.

Support was examined as a moderator with individual *drinking frequency* as the criterion. The model was not significant $F(4,121) = 0.29$, $p = .883$, and accounted for 1.0% of variance in individual drinking frequency. The interaction between the proportion of drinking buddies in one's network and support scores was also not significant, $B = -0.15$, $p = .358$, suggesting that friendship support did not significantly moderate the association between proportion of drinking buddies in one's network and individual drinking frequency. This model did not yield any statistically significant main effects.

Support was examined as a moderator with *alcohol-related consequences* as the criterion. Five predictors were included in the model: proportion of drinking buddies in one's network (IV), QRI Support scores (moderator), the interaction term between the IV and moderator, sex (covariate), and individual drinking quantity (covariate). This model was significant $F(5,120) = 7.26$, $p < .001$, accounting for 23.2% of variance in individual drinking consequences. No significant interaction emerged between proportion of drinking buddies in one's network and support, $B = -0.35$, $p = .470$, indicating that friendship support did not moderate the relationship

between proportion of drinking buddies in one's network and individual drinking consequences. The main effect of drinking quantity was significant at the $p < .001$ level.

Table 7

Aim 3: Relationship Traits Regression Statistics

	Stability			Intimacy			Support		
Outcome	*B*	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*
Quantity									
(Intercept)	10.46	1.86	.000*	10.23	1.94	.000*	9.99	2.00	.000*
Proportion DB	2.39	2.60	.360	2.83	2.70	.297	2.84	2.69	.294
Moderator	-0.52	0.16	.002*	0.01	0.12	.927	-0.04	0.21	.841
Prop. DB x Moderator	-1.35	0.77	.084	0.05	0.46	.912	0.30	0.85	.720
Sex	-1.32	2.00	.511	-1.17	2.08	.576	-0.92	2.15	.670
Frequency									
(Intercept)	2.89	0.36	.000*	2.87	0.36	.000*	2.91	0.37	.000*
Proportion DB	0.03	0.50	.949	0.23	0.50	.641	0.23	0.50	.639
Moderator	0.01	0.03	.984	0.01	0.02	.733	0.01	0.04	.937
Prop. DB x Moderator	-0.20	0.15	.191	-0.08	0.09	.337	-0.14	0.16	.388
Sex	-0.19	0.38	.613	-0.17	0.38	.655	-0.22	0.40	.582
Consequences									
(Intercept)	4.03	1.26	.002*	3.77	1.20	.002*	3.56	1.25	.005
Proportion DB	2.00	1.57	.206	2.75	1.52	.072	2.55	1.55	.101
Moderator	-0.12	0.10	.264	-0.22	0.07	.002*	-0.26	0.12	.033
Prop. DB x Moderator	-0.22	0.47	.642	-0.19	0.26	.460	-0.34	0.48	.479
Sex	-0.26	1.21	.769	-0.23	1.16	.846	0.05	1.23	.969
Drinking Quantity	0.26	0.05	.000*	0.28	0.05	.000*	0.27	0.05	.000*

Note. DB = drinking buddy. Prop. DB = proportion of drinking buddies in network. Moderator refers to the main effect of the moderator in each column. Significance determined at $p < .0021$.

CHAPTER IV

DISCUSSION

The present study sought to examine moderators of the association between drinking buddies in one's social network and individual drinking outcomes (i.e., drinking quantity, frequency, and alcohol-related consequences). Specifically, we aimed to evaluate (1) characteristics of the individual (i.e., drinking refusal self-efficacy and positive alcohol outcome expectancies), (2) characteristics of their drinking buddy peer (i.e., descriptive norms, injunctive norms, and peer popularity), and (3) characteristics of their relationship (i.e., stability, intimacy, and support), as moderators of this association. It was anticipated that having a greater proportion of drinking buddies in one's network would be linked to greater drinking outcomes. Across the three aims, it was hypothesized that having greater drinking refusal self-efficacy and positive alcohol expectancies would be associated with greater drinking outcomes. In addition, it was expected that perceiving one's peer to have greater descriptive norms, stronger injunctive norms, or greater popularity would be linked to increased drinking outcomes. Finally, it was hypothesized that perceiving one's relationship with a drinking buddy to be more intimate, stable, and supportive would be associated with increased drinking outcomes. In general, findings suggested that across aims, only descriptive norms emerged as a significant moderator. The general pattern of null findings may be attributed to the non-significant association between drinking buddies in one's network and individual alcohol outcomes, or due to insufficient power. A specific discussion of each aim, as well as a general discussion, follows.

Aim 1: Individual Characteristics

The first aim of this study was to examine the moderating role of individual characteristics on the link between drinking buddies in one's network and individual drinking.

Research suggests certain individuals may be more or less susceptible to the influence of their peers. Two constructs, DRSE and positive alcohol expectancies, have both been associated with vulnerability to peer influence (Jang et al., 2012; Ting et al., 2015), but have mainly been examined amongst adolescents. As such, the generalizability of findings in college students, specifically in the context of drinking buddies, is unclear. Given these significant gaps, aim 1a of the study was to examine DRSE as a moderator of the association between drinking buddies in one's network and individual drinking outcomes. Contrary to our hypothesis, results indicated that DRSE was not a moderator of this relationship. These findings are inconsistent with the limited prior research findings linking DRSE to peer influence (Jang et al., 2012). One possible reason for these findings is that the development of DRSE may rely on factors outside of peer influence. For example, beliefs that one is incapable of refusing alcohol may stem from historical instances of actually being unable to refuse alcohol, rather than from peer influence. Researchers have posited that this may indeed be the case—low DRSE may develop from a history of failed attempts at refusal (Gullo et al., 2010; Oei & Baldwin, 1994).

Another possible explanation is the nature of our methodology. The DRSEQ-R (Oei et al., 2005) assesses DRSE throughout a variety of contexts (e.g., "when you are angry" or "when you are watching TV"), rather than strictly social contexts. Despite this, all contexts are averaged together to produce an average DRSE score. However, it is possible that specific subsets of questions, such as questions assessing DRSE in social contexts (e.g., "when someone offers you a drink" or "when you see others drinking") may be more relevant in understanding how peer influence relates to DRSE. One study examining DRSE in a real bar context found that across all subcategories of DRSE, only social DRSE significantly predicted drinking, such that lower social DRSE was linked to greater alcohol consumption (Monk & Heim, 2013). In examining the

association between the DRSE subscales and our drinking outcomes at the bivariate level, it appears that, while all three subscales (i.e., Social Pressure, Emotional Relief, and Opportunistic) are significantly correlated with drinking quantity, frequency, and consequences at the $p<.001$ level, the social pressure has the largest correlation across all three outcomes. As a result, the impact of DRSE in social contexts specifically may be attenuated when DRSE is averaged across all contexts.

Despite our lack of findings on the moderating role of DRSE, there was a significant main effect of DRSE on both drinking frequency and drinking consequences, and a marginally significant main effect on drinking quantity. These results support prior research that highlights DRSE as a notable predictor of drinking outcomes (Ehret et al., 2013; Foster et al., 2014; Kenney et al., 2013; Oei & Jardim, 2007), and continues to reinforce its relevance as a potential target for intervention (Voogt et al., 2014; Witkiewitz et al., 2012).

In examining positive alcohol expectancies as a moderator, contrary to our prediction, expectancies did not emerge as a moderator on any of the drinking outcomes. These findings were inconsistent with prior work on drinking buddies, which has implicated positive alcohol expectancies as a relevant factor in drinking buddy relationships (Lau-Barraco et al., 2012). However, this may be because previous studies (i.e., Lau-Barraco et al., 2012) have examined expectancies as a mediator, rather than a moderator, of the drinking buddy-drinking association. Similarly, another possible explanation for our findings may be that college students self-select drinking buddies with similar expectancies. In other words, perhaps positive alcohol expectancies amongst college students are not as augmented by peer drinking behaviors as previously predicted. Prior studies have suggested that individual factors, such as personality and psychopathology, and environmental factors, such as peer and parental influence, are predictive

of the formation of positive alcohol expectancies in adolescents (Bekman & Goldman, 2011), and that these positive expectancies tend to solidify in late adolescence (Wardell & Read, 2013). As a result, by the time an individual enters college, positive alcohol expectancies may already be established. Individuals may then self-select into drinking groups with others with strong positive alcohol expectancies. In other words, the conditions under which expectancies are impactful on drinking behavior appear to be less important than the mechanism that underlies expectancies. Taken together, these findings suggest that expectancies may be more aptly examined as a mediator, rather than a moderator, of the drinking buddy-drinking association.

While several daily diary studies point to expectancies demonstrating daily variability (Lee et al., 2015; Patrick et al., 2016), it is not clear that this variability occurs because of proximal peer influence. Given that drinking behavior fluctuates greatly throughout the week, particularly when comparing weekday and weekend drinking (Lac et al., 2016), and given that drinking on different days of the week has shown to be associated with varying expectancies (Lac & Luk, 2019; Lau-Barraco et al., 2016), it is unsurprising that expectancies would vary on a day-to-day level, as an individual's motives and intentions to drink that day may influence their expected drinking outcomes. For example, if an individual does not intend to drink on a Monday as their peers are not drinking, they have homework that night, and class in the morning—their expectancies would likely be quite different than expectancies on a Friday night. Moreover, some (e.g., Lee et al., 2015; Patrick et al., 2016) daily diary studies assess participant expectancies if they were to drink *that day*, rather than their perceptions regarding the outcomes of drinking in general. Given that our expectancy measure assesses more general beliefs about the outcomes of drinking, it is likely that our study captured the more stable, underlying beliefs about the outcomes of alcohol consumption that a person may hold. Of note, the main effect of

expectancies for both drinking quantity and drinking frequency approached significance—which is consistent with prior findings indicating that individual alcohol expectancies are salient predictors of individual drinking in general (Leigh & Stacy, 2004). Our finding adds to a robust body of literature supporting the prominent relationship between positive alcohol expectancies and alcohol consumption, but fails to draw conclusions regarding the impact of drinking buddy influence.

Aim 2: Peer Characteristics

The second aim of our study was to examine the moderating role of peer characteristics, in an effort to identify which drinking buddies are particularly influential on individual drinking. Evidence suggests that certain peers may be more influential on behavioral outcomes than other peers (Allen et al., 2005; Brechwald & Prinstein, 2011; Sasson & Mesch, 2014). While peer characteristics have been examined in relation to college student drinking, limited research exists on the role of descriptive norms, injunctive norms, and popularity in drinking buddy peers specifically. As such, the second aim of this study sought to address the gap in drinking buddy literature by investigating peer characteristics as moderators of the association between drinking buddies in one's network and individual drinking outcomes. It was anticipated that stronger descriptive norms, injunctive norms, and peer popularity would strengthen the link between drinking buddies and personal drinking. Our findings provided partial support for descriptive norms. In particular, descriptive norms significantly moderated drinking quantity. The model explained up to 34% of the variability in drinking quantity. Neither drinking frequency nor drinking consequences were moderated by descriptive norms following Bonferroni adjustment.

Our findings generally supported previous research, which highlights descriptive norms as a strong predictor of individual drinking in college students (Borsari & Carey, 2003; Halim et

al., 2012). However, our findings are only partially congruent to previous studies examining descriptive norms a moderator of drinking buddy influence specifically (Lau-Barraco & Linden, 2014). While both studies found descriptive norms to significantly moderate drinking buddy influence on drinking quantity, unlike the Lau-Barraco & Linden (2014) study, we failed to replicate this relationship for either drinking frequency or drinking consequences. Interestingly, Lau-Barraco & Linden (2014) found that the moderation occurred at low levels of descriptive norms—such that perceiving low peer drinking strengthened the link between drinking buddies in one's network and individual drinking quantity. However, our results indicated that this moderation occurred at greater levels of descriptive norms—where individuals who perceived their peers to drink more were at risk for drinking buddies potentially impacting greater individual drinking. One reason for these differences may be that socializing with drinking buddies who are heavy drinkers in particular confers additional risk for personal drinking, but this observation may not be replicated in the opposite direction. In other words, it is possible that socializing with drinking buddies who are light drinkers does not necessarily serve as a protective factor from increased drinking outcomes.

Interestingly, there was no observed moderation, nor main effect, of descriptive norms for drinking frequency and drinking consequences. While the moderation for drinking frequency approached significance (p=.019), it is possible that our conservative Bonferroni correction resulted in a Type II error. Regarding drinking consequences, one possibility for the null findings may be due to the inclusion of drinking quantity as a covariate in the analysis. Drinking quantity in general is greatly predictive of alcohol-related consequences (Carpenter & Merrill, 2021; Patrick et al., 2020) and this was supported by findings in our sample that drinking quantity and consequences were significantly correlated at the bivariate level (p<.001). Despite evidence

supporting drinking quantity and drinking consequences as unique outcomes (Mallett et al., 2011; Patrick et al., 2020), our findings suggest that the majority of unique variance in this model was captured by our inclusion of drinking quantity as a covariate. Thus, descriptive norms impact the influence of drinking buddies peers on how much an individual drinks but they do not exert unique impact on problems experienced.

In examining injunctive norms as a moderator, contrary to our hypothesis, there was no moderating effect for any of the drinking outcomes. These findings differ from prior literature, which has supported that the link between peer drinking and personal drinking outcomes is augmented by perceptions of a peers' permissibility towards drinking (Borsari & Carey, 2001; Lee et al., 2007; Yang, 2018). However, findings are in concordance with previous research on drinking buddies, which has suggested that injunctive norms do not moderate the link between drinking buddies in one's network and alcohol outcomes (Lau-Barraco & Linden, 2014). One possible reason for the mixed literature could be that individuals select drinking buddies that already hold similar beliefs regarding the permissibility of drinking. In other words, rather than peer injunctive norms influencing individual drinking (i.e., socialization), individuals select drinking buddies with similar beliefs regarding the permissibility of drinking (i.e., selection). Evidence supports that injunctive norms operate under principles of both selection and socialization (Lewis et al., 2015). Perhaps for drinking buddies, the role of selection is particularly important.

Interestingly, while there were no moderation by injunctive norms, there was a main effect of injunctive norms on alcohol-related consequences. This finding is consistent with previous studies, which have found that stronger injunctive norms are related to more alcohol-related problems (LaBrie et al., 2010; Larimer et al., 2004). Injunctive norms may be particularly

salient in accounting for problems, as our injunctive norms instrument assesses permissibility, including in the context of potentially dangerous situations (e.g., “driving a car after drinking” or “drinking enough alcohol to pass out”). As a result, perceiving that one’s peers approve of such behaviors may predict individual engagement in the same behaviors. For example, believing that one’s peers are accepting of drinking enough alcohol to pass out may be linked to personally drinking enough alcohol to pass out—which may then be predictive of consequences such as hangovers, getting sick, and blacking out.

In examining popularity as a moderator, against our hypothesis, popularity did not significantly moderate drinking quantity or frequency. Further, popularity was a marginally significant moderator of alcohol-related consequences ($p = .05$) failing to meet our Bonferroni-corrected p-level ($p < .002$). These results are contradictory to prior research, which supports that popular peers are salient influences on individual drinking (Allen et al., 2012; Dumas et al., 2014; Sweeting & Hunt, 2015). However, given that, to the best of our knowledge, there is no previous literature examining drinking buddy popularity as a relevant factor on individual drinking, it is possible that previous findings on popularity do not generalize to drinking buddy relationships.

Previous research has also highlighted popularity as a moderator of peer influence specifically (Duell et al., 2022; Fallu et al., 2011), which our study failed to replicate. One methodological reason for the lack of moderation support for peer popularity may be due to how it was assessed. Prior research on popularity is often conducted using sociometric procedures (often among adolescents; i.e., Allen et al., 2012; Cillessen & Rose, 2005), whereby an individual’s popularity is determined by the number of nominations received from peers within a reference group (e.g., a classroom or school). The current study utilized self-report methodology,

where participants completed a self-report instrument assessing their perceptions of a peer's popularity more generally. As a result, unlike other methods, participants may not have had a specific reference group to accurately compare and evaluate their peers' popularity. This lack of a reference group may have led to participants being unable to make direct comparisons between their peer and others, failing to place their popularity accurately within a social context. In addition, given that our method utilized multiple self-report questions to assess popularity, rather than the total number of popularity nominations, it is possible that our construct of popularity does not align with that of prior work. For example, our instrument explicitly incorporated items assessing constructs that have been implicated as relevant to defining popularity, including likeability and attractiveness (Dijkstra et al., 2010; Lansu et al., 2022). As a result, these items may result in unique differences when compared to studies using one item assessing only popularity and not related constructs.

Aim 3: Relationship Characteristics

The final aim of the current study was to examine the moderating role of relationship characteristics. We sought to examine if high quality friendships may be particularly influential on drinking behaviors, as prior research has shown that the quality of one's friendship may increase one's risk for alcohol outcomes (Paek, 2009; Russell et al., 2021b; Urberg et al., 2003; Yanovitzky et al., 2006. Guided by Borsari & Carey's (2006) framework, we operationalized relationship quality as a combination of three factors: intimacy, stability, and support. Some evidence has suggested that perceptions of intimacy and peer support in a peer relationship have been linked to increased individual alcohol outcomes (Palmqvist & Santavirta, 2006; Urberg et al., 2005), although findings are inconsistent (Hussong et al., 2001; Karakos, 2014; Lau-Barraco & Linden, 2014). Findings on relationship stability and drinking outcomes are also mixed (Allen

et al., 2006; Allen et al., 2012; Laursen et al., 2012; Schaefer et al., 2021). Notably, very little research has examined relationship quality as it pertains to drinking buddies, and no studies have examined the moderating effect of relationship characteristics on drinking buddy influence. Thus, the third aim sought to address the gap in drinking buddy literature by investigating relationship characteristics (i.e., stability, intimacy, and support) as moderators of the association between drinking buddies in one's network and individual drinking outcomes.

Findings regarding relationship stability (Aim 3a) revealed that contrary to our hypothesis, stability did not moderate these associations. Results are inconsistent with some research indicating that the length of a peer friendship predicts drinking outcomes (Allen et al., 2006; Schaefer et al., 2021). In particular, previous findings have suggested that highly stable relationships might be more protective from drinking outcomes, as they enhance an individual's sense of autonomy (Allen et al., 2006), while others have suggested that stable friendships are more influential on personal drinking (Bot et al., 2005), suggesting stable friendships are indeed influential, but in mixed directions. However, our findings are consistent with other studies, which have failed to replicate a link between relationship stability and drinking outcomes (Jaccard et al., 2005; Laursen et al., 2012). Our null findings on the impact of relationship stability may be the result of our conceptualization of stability. While many longitudinal studies define relationship stability as a calculation of changes in social network over time, given our limitations on collecting data longitudinally, our study defined stability as the self-reported number of years of one's friendship. As a result, our findings may present differently than previous research.

Despite this, a significant main effect of friendship stability emerged specifically for drinking quantity—suggesting that shorter drinking buddy friendships were predictive of greater

drinking. Prior work has implicated stability as a key factor in strong relationships amongst college student drinkers (Borsari & Carey, 2006). Recent research has highlighted that college student drinking is linked to greater friendship instability (i.e., the creation and deterioration of peer friendships; Schaefer et al., 2021). Our significant main effect supports that this may be the case for drinking buddies as well.

There are several possible reasons for our observed link between friendship instability and greater drinking outcomes. First, perhaps an individual is more likely to conform to a new drinking buddy's drinking habits as an attempt to achieve social acceptance (Litt et al., 2012). Second, perhaps it is the alcohol use itself that causes shorter friendships, due to reasons such as social consequences from drinking (Schaefer et al., 2021). Third, it is possible individuals drink because they are coping with the lack of stable friendships (Borsari & Carey, 2006). Finally, this main effect may reflect the nature of drinking buddy relationships, which by definition revolve around drinking. As a result, if drinking is unavailable to either party, the friendship may become strained or even dissipate. As a whole, this study was among the first to examine relationship stability as a moderator of drinking buddy influence. Additional research assessing the temporal role of friendship stability on individual drinking is warranted.

In examining the moderating role of relationship intimacy (Aim 3b), contrary to our hypothesis, intimacy was not a moderator of any associations. In general, literature examining relationship intimacy as a moderator of peer influence on drinking outcomes is limited. While prior work has found that drinking buddy relationships are perceived to be close (Lau-Barraco & Linden, 2014), our findings suggest that this sense of intimacy does not necessarily augment the impact of a peer's influence. In other words, perhaps drinking buddies are influential on personal drinking whether or not they are perceived to be intimate.

Despite our null moderation, a main effect of intimacy emerged for alcohol-related consequences, indicating that individuals with lower perceived intimacy in drinking buddy relationships also experience a greater number of problems from their drinking. These findings are inconsistent with some work suggesting more intimate friendships are associated with more drinking (Palmqvist & Santavirta, 2006), but consistent with other work suggesting intimate friendships serve to buffer against drinking outcomes (Fujimoto & Valente, 2012). One possible explanation for our main effect is similar to that for stability: perhaps individuals cope with a lack of intimate friendships by drinking (Borsari & Carey, 2006). Findings are in light of a very small body of research assessing relationship intimacy among college drinkers—particularly in the context of drinking buddies. Future research should aim to examine the temporality of relationship intimacy, to examine whether college students drink as a result of influence from low intimacy relationships, or if low intimacy friendships are influential factors in predicting individual alcohol use.

In examining relationship support as a moderator (Aim 3c), contrary to our hypothesis, it did not impact the link between drinking buddies and individual drinking outcomes. In general, prior literature has indicated that supportive friendships may buffer individual drinking outcomes (Borsari & Carey, 2006; Cullum et al., 2013; Park et al., 2009; Pauley & Hesse, 2009), but the direction of this relationship may be specific to non-drinking peers. For example, previous research on drinking buddies has suggested that over half of individuals with drinking buddies perceive them to be available for social support (Lau-Barraco & Linden, 2014). One reason for our lack of findings on support may be similar to the other constructs pertaining to relationship quality—it may be that perceptions of support simply do not augment the influence of drinking buddies. In other words, a drinking buddy may exert their influence whether they are perceived

as supportive or not supportive. It is also possible that drinking buddy relationships operate differently than other peers in one's network. For example, while supportive peers in one's network serve as a buffer against drinking outcomes (Borsari & Carey, 2006; Cullum et al., 2013; Park et al., 2009), supportive drinking buddies may not offer the same benefit—as both parties engage in drinking behaviors together. Taken together, whether support specifically from drinking buddies affects individual drinking remains unclear. Future research should investigate if and how social support stemming from drinking buddies specifically may impact drinking outcomes—particularly if support from drinking buddies serves to exacerbate alcohol use.

General Discussion

College students are at risk for increased drinking outcomes (SAMHSA, 2020). One factor that has shown to predict drinking behavior is peer relationships. A specific subset of peers in one's network known as drinking buddies have shown to predict drinking outcomes, above and beyond drinking peers in one's network. However, little is known about how and under what conditions drinking buddies exert their influence on personal drinking. To address this issue, the current study sought to explore the conditions under which key drinkers in one's social network may be related to personal alcohol use behaviors. We investigated three primary domains that may impact the association between one's drinking buddies and drinking: characteristics of the individual drinker, their drinking buddies, and their relationship.

Our findings indicated that across the three domains investigated, only one facet under the drinking buddy domain emerged as a significant factor. Specifically, having more drinking buddies in one's network relates to higher drinking quantity, but only for those who perceived their friends to drink more heavily. This finding echoes prior research on drinking buddies (Lau-

Barraco & Linden, 2014), and contributes to a larger body of research pointing to descriptive norms as a salient predictor of alcohol outcomes, specifically in the context of peer relationships.

The significant moderating effect of descriptive norms observed is consistent with the observational learning component of the social cognitive theory (SCT). SCT states that behavior is the result of an interplay between cognitions and environmental influences (e.g., peer effects). Thus, SCT suggests that peer descriptive norms may augment individual drinking via social modeling. In other words, witnessing peers' drinking patterns may influence individuals to model and engage in these same patterns. Unsurprisingly, the perception that one's peers drink heavily is predictive of greater individual drinking—but perceptions that one's peers do not drink heavily does not seem to buffer (or reverse) this relationship. This consideration is relevant in light of possible social network-based interventions, indicating that interventions targeting descriptive norms may be particularly effective for those who perceive their drinking buddies to be heavy drinkers.

Beyond descriptive norms as a moderator, the current study failed to support the other moderating factors examined. There are several potential reasons for this null pattern of results. One reason may be attributed to a lack of association between social network drinking buddies and alcohol outcomes. Specifically, the proportion of drinking buddies in one's network was not correlated with drinking quantity, frequency, or consequences. Consequently, significant moderations were less likely in the absence of significant bivariate associations between variables (Whisman & McClelland, 2005).

The lack of association between drinking buddies and personal drinking observed in the present investigation is peculiar. Out of the 11 prior studies examining network drinking buddies, 10 found significant associations (Homish & Leonard, 2008; Kehayes et al., 2021; Lau-Barraco

et al., 2012; Lau-Barraco & Linden, 2014; Leonard et al., 2000; Leonard & Homish, 2008; Leonard & Mudar, 2003; Nogueira et al., 2019; Reifman et al., 2006; Yang et al., 2013), with only one study failing to find a link (Lau-Barraco & Collins, 2011). Given the prior robust research supporting drinking buddy impact on drinking, our lack of significant results may be due to our unique focus on peers. All other investigations of drinking buddies focused on all social network members, including parents, siblings, partners, children, friends, extended family, in-laws, and coworkers. Thus, the specific focus on peers may have limited our study from assessing the full scope of drinking buddies in one's network, potentially resulting in unique findings.

Another possible reason for our lack of findings is that our study was not adequately powered. An a priori power analysis indicated that 166 participants were necessary to successfully power our statistical analyses. However, after cleaning data and removing data from participants who did not endorse any drinking buddies, only 130 participants were included in final analyses. As a result, certain relationships may not have been detected as significant due to lower variability, particularly if the effect sizes for those relationships were even smaller than the small-to-moderate effect size assumed in our power analyses. In addition, our Bonferroni-correction resulted in an adjusted alpha level of p=.0021, which reduced Type I error but may have also contributed to increased risk for Type II error. This concern becomes relevant when observing certain moderation analyses that were marginally significant. While it is possible that indeed these patterns of associations are null, it may also be possible that the insufficient sample size combined with efforts to control for Type II errors resulted in the lack of significant findings.

It is also possible that the null pattern of results is due to the lack of salience of the chosen moderating factors in impact the drinking buddy-drinking relationship. Specific to characteristics of the individual, it is possible that neither of the two cognitive constructs of SCT, drinking refusal self-efficacy and positive alcohol expectancies, are particularly associated with peer influence—specifically in the context of drinking buddies. While some previous research supports drink refusal self-efficacy as a salient predictor of individual drinking (Foster et al., 2014; Kim & Kuan, 2020; Oei & Jardim, 2007), research on its impact on the peer drinking and personal drinking association is limited, and mostly conducted in adolescent populations (Jang et al., 2012). Consequently, it is possible that these findings do not generalize to college student populations, or to drinking buddy dyads.

As for positive alcohol expectancies, they have been shown to predict individual drinking (Leigh & Stacy, 2004; Oei & Morawska, 2004) and be impacted by peer pressure (Bartolo et al., 2022; Ting et al., 2015). Given the body of research supporting the role of expectancies in peer associations (Bartolo et al., 2022; Ting et al., 2015), it is surprising that expectancies did not emerge as a significant moderator. However, it is possible that positive expectancies are not a relevant cognitive factor in determining the conditions under which one may be susceptible to peer influence—especially when examining drinking buddy relationships. Specifically, given prior work on drinking buddies that has supported the role of expectancies as a mediator (i.e., Lau-Barraco et al., 2012), it may be possible that expectancies are better understood as a mediator, rather than a moderator, of personal drinking. In other words, it is possible alcohol expectancies serve to explain the link between drinking buddies in one's network and individual drinking outcomes—rather than simply strengthening this link.

Regarding characteristics of the peer, prior literature has suggested that perceptions of peer attributes may predict how influential that peer is. In particular, our study examined peer social norms (i.e., descriptive norms and injunctive norms) and peer social status (i.e., popularity). Descriptive and injunctive norms have both been supported as a predictor for drinking (Buckner et al., 2011; DiGuiseppi et al., 2018; Gersh et al., 2019; Perkins et al., 2005). However, while descriptive norms emerged as a significant moderator, injunctive norms did not—a pattern that has previously emerged in other drinking buddy studies (Lau-Barraco & Linden, 2014). In examining these findings, it is possible that descriptive and injunctive norms differ. Specifically, descriptive norms refer to observable behavior, whereas injunctive norms refer to an inference regarding a peer's attitudes, which may be less immediately obvious. As a result, injunctive norms may not necessarily augment a drinking buddy's influence, as the inference may be inaccurate or contradictory compared to the peer's actual drinking behavior.

In addition, we did not find support for peer popularity, which has previously been implicated as a factor in peer influence (Brechwald & Prinstein, 2011; Kwon & Lease; Lease et al., 2020; Teunissen et al., 2012). There are several possibilities for this. One, perhaps the construct of popularity holds a different meaning amongst college students than it does for adolescents. Despite evidence suggesting that the construct of popularity persists into emerging adulthood, adolescent conceptualizations of popularity appear to be more reflective of social power, whereas young adult conceptualizations are more indicative of likeability and prosocial behavior (Lansu et al., 2022; O'Mealey & Mayeaux, 2022). As such, it is possible that literature suggesting popular peers are more influential is unable to generalize to college student drinking buddy populations. Second, prior work on popularity has typically relied on procedures requiring a participant to rank a peer's popularity in the context of a reference group. Given that our study

utilized a self-report measure of a more "general" construct of popularity, it is possible our study's conceptualization of popularity is not supported by prior work.

Pertaining to characteristics of the relationship, some prior work has suggested that the quality of a relationship may impact the influence of a peer (Urberg et al., 2003), including in the context of drinking (Paek, 2009; Russell et al., 2021b; Yanovitzky et al., 2006). While some evidence purports that high quality relationships increase risk of drinking, other work points to high quality relationships buffering against drinking outcomes (Kim et al., 2018; Poulin et al.., 1999). Given these mixed research findings, it is unsurprising that our findings did not replicate prior research. While our study was guided by Borsari & Carey's (2006) framework establishing stability, intimacy, and support as the three factors defining relationship quality among college student drinkers, prior work has defined relationship quality using a variety of constructs, such as warmth, conflict, trust, and communication (McCloskey & Stuewig, 2001; Pittman & Richmond, 2008). While it is expected that these constructs would have some overlap between stability, intimacy, and support, our selection of these three constructs may be excluding constructs relevant to the quality of a relationship. In addition, given that findings on the impact of stability, intimacy, and support on drinking outcomes are mixed (Allen et al., 2006; Allen et al., 2012; Laursen et al., 2012; Schaefer et al., 2021; Palmqvist & Santavirta, 2006), it is possible that the argument for these specific factors being relevant in drinking buddy relationships is not well supported.

Despite our lack of findings on impacting factors, several main effects emerged. Across all the domains assessed, drink refusal self-efficacy predicted all three drinking outcomes, and positive expectancies predicted both drinking quantity and consequences—which is consistent with prior literature establishing drink refusal self-efficacy and expectancies as two cognitive

constructs that are salient predictors of alcohol outcomes (Oei & Jardim, 2007; Oei & Morawska, 2004). In addition, descriptive norms predicted drinking frequency, and injunctive norms predicted drinking consequences—factors that have previously been shown to predict individual drinking outcomes (Borsari & Carey, 2003; DiGuiseppi et al., 2014; Gersh et al., 2019). Moreover, friendship stability predicted drinking quantity, and friendship intimacy predicted alcohol-related consequences—two relationship quality constructs that have been shown to be linked to college student drinking (Borsari & Carey, 2006). In general, findings suggest that characteristics of the individual, the peer, and their relationship may be associated with individual drinking outcomes, but these characteristics as moderators of the link between the proportion of drinking buddies in one's network and individual drinking remains unclear. Taken together, the current study supports and adds to this larger drinking literature by demonstrating that these constructs are relevant in predicting alcohol use amongst college drinkers.

The present study contributed to the literature in several additional ways. First, this study addressed a significant gap in drinking buddy literature. While the body of literature on drinking buddies generally supports drinking buddies as influential members of one's social network (Lau-Barraco et al., 2022; Lau-Barraco & Linden, 2014; Leonard et al., 2000; Reifman et al., 2006), prior investigations had yet to address factors that may be associated with an increased magnitude of drinking buddy effects. Given this gap, this study is among the first to examine moderators of drinking buddy influence, specifically as it pertains to individual, peer, and relationship characteristics.

Another contribution is a focus on previously unexamined moderators of impact that prior research supports as key to peer influence. Examining these unexplored factors increased our knowledge based about the complex dynamics of peer influence, particularly as they relate to

risky drinking peers in one's network. Specifically, this is one of the first studies to examine the moderating impact of alcohol outcome expectancies and drink refusal self-efficacy, two cognitive constructs that may serve to increase susceptibility to drinking buddy influence. While several studies have examined alcohol outcome expectancies in the context of drinking buddies (Homish & Leonard, 2008; Lau-Barraco et al., 2012; Lau-Barraco & Linden, 2014; Leonard & Homish, 2008), these studies have focused primarily on examining expectancies as a mediator, rather than a moderator, of possible peer influence. Evaluating expectancies as a moderator contributes to efforts to identify when and for whom this relationship is stronger or weaker. In other words, examining the moderating role of expectancies allows us to understand the contexts in which expectancies may be relevant and influential.

Moreover, this study was among the first to examine drink refusal self-efficacy in the context of drinking buddies. Given that drink refusal self-efficacy is associated with both peer influence (Jang et al., 2012) and individual drinking outcomes (Foster et al., 2014; Kenney et al., 2014; Oei & Jardim, 2007), this study attempted to shed light on the role of drink refusal self-efficacy as a susceptibility factor to peer influence from drinking buddies. While our findings did not support for its moderating role, it remains possible that drink refusal self-efficacy is relevant in buffering individuals from influential peers. Combined with prior work, and our significant main effects, drink refusal self-efficacy remains as a construct that might buffer individuals from drinking outcomes—including those with risky drinking peers in their networks.

Additionally, this study is one of few to examine perceptions of peer popularity in college student populations. To the best of our knowledge, only two studies have assessed perceptions of popularity in college students (Dumas et al., 2014b; Dumas et al., 2018), and neither of these studies examined drinking buddies specifically. In addition, prior studies have focused only on

sociometric popularity or popularity within small groups, rather than general perceptions of a peer's popularity. Consequently, this study provided insight on perceptions of popularity, not only in college student drinkers, but amongst drinking buddies specifically. Given that college students are particularly at-risk for drinking outcomes, and because college students with drinking buddies engender even greater risk, identifying specific influential peers is warranted. These findings contribute to a limited body of knowledge on understanding how peers who are perceived as high-status may or may not be influential on drinking behaviors in young adult populations.

Finally, this study contributed novel information on whether the quality of drinking buddy relationships impacts drinking outcomes. Prior literature on the role of relationship quality (e.g., intimacy, stability, and support; Borsari & Carey, 2006) on drinking outcomes has been conducted mainly with adolescents, and findings have been mixed (Allen et al., 2006; Allen et al., 2012; Hussong et al., 2001; Karakos, 2014; Laursen et al., 2012; Palmqvist & Santavirta, 2006; Schaefer et al., 2021; Urberg et al., 2005). In addition, while some studies on drinking buddies have examined constructs of relationship quality, such as closeness and support (Lau-Barraco & Linden, 2014; Reifman et al., 2006), findings have been primarily descriptive in nature, and the moderating role of relationship quality had not been examined. Thus, this was among the first studies to examine facets of relationship quality as a moderator of drinking buddy influence on drinking outcomes. While moderations were null, several emerging main effects suggest that qualities of peer relationships may be relevant in predicting individual drinking, including amongst those with risky peer drinkers in their network.

Implications

The findings of this study have several relevant implications, specifically in the realm of clinical interventions for college drinking. In general, literature examining the efficacy of social-network based interventions for drinking have shown promise, including several meta-analyses (Hunter et al., 2019; Shelton et al., 2019) and studies specific to college students (Reid & Carey, 2015). Specific to our significant moderation, our findings underscore the relevance of descriptive norms as a potential avenue for intervention. One systematic review indicated that interventions targeting descriptive norms among college students have found success (Reid & Carey, 2015). In comparison, our findings highlight that descriptive norms are equally salient in the context of drinking buddy relationships—a particularly high-risk category of drinking peers. To the best of our knowledge, no prior intervention has targeted descriptive norms in drinking buddies specifically. Despite this, some recent work supports interventions on those with drinking buddies—with findings showing that those with a greater proportion of drinking buddies in their network benefit more from a brief intervention (Lau-Barraco et al., 2022). Taken together, our findings contribute to a much broader body of literature on descriptive norms, highlighting that prior work on descriptive norms appears to be applicable to high-risk drinking buddy relationships as well. As such, future interventions could implement ways to reduce the harmful impact of perceptions of peer drinking habits.

Future Directions

Given the current study findings, several directions for future research are proposed. First, our study methodology precluded determinations about the direction of impact between social network peers and personal drinking. Thus, it is unclear if socialization effects, selection effects, or both, may be involved. While we did not find a significant link between drinking

buddies in one's network and individual drinking, findings are peculiar in the context of prior work on drinking buddies. Consequently, future research should aim to replicate the current study methodology with a sufficient sample size, while also expanding the definition of a drinking buddy beyond peers alone. In addition, a replication of our study that includes individuals who do not endorse any drinking buddies in their network may obtain information on both low-risk and high-risk social networks.

Second, future data collection methods should aim to capture both between-person and within-person variability. As such, the use of a multilevel analysis of data where drinking buddies are nested within participants would permit for an evaluation of the impact of a participant's unique set of drinking buddies on their alcohol consumption, rather than the average impact of drinking buddies on individual drinking. In other words, a multilevel approach could link each participant to each individual drinking buddy, eliminating the need to aggregate across drinking buddies and capturing additional nuance in drinking buddy relationships. This more robust statistical methodology could serve to account for varying social network sizes, missing data on network members, and improve the ability to detect small effects.

Similarly, rather than using the proportion of drinking buddies in one's network as a predictor when assessing drinking buddy peers, future research may choose to look at perceived drinking buddy drinking quantity as the predictor (i.e., descriptive norms). While some debate exists about the accuracy of perceptions of peer drinking, evidence suggests that among close peers (i.e., members of one's network), these perceptions are highly accurate (Kenney et al., 2017; Mason et al., 2019). In addition, it appears that perceptions of, rather than actual, peer drinking is a more salient predictor of personal drinking (Kenney et al, 2017). Thus, perceived

peer drinking quantity may serve as a more proximal predictor of individual drinking than proportion of drinking buddies in one's network.

An additional direction pertaining to relationship quality could be utilizing an alternative measure for assessing characteristics of the relationship. The current study was guided by Borsari & Carey's (2006) framework in selecting intimacy, stability, and support as the three constructs pertaining to college student drinking relationships. As such, we investigated perceptions of relationship intimacy and support by using subscales from larger relationship inventories and assessed stability with a single item. An alternative approach might use a broader, more encompassing measure to assess relationship quality. For example, a measure of peer relationship quality that has subscales and has been validated and shown to be reliable may be a stronger choice than comparing findings between unique subscales from different measures.

Another future direction is the consideration of broader and other constructs addressing which individuals are most susceptible to peer effects on drinking, and which peers are most influential on individual drinking outcomes. In particular, guided by theory and prior research, factors related to drinking motivations (Beck et al., 2013), mental health problems (Pedrelli et al., 2015), and even personality factors (Adan et al., 2017) may be particularly impactful in understanding susceptibility to peer effects on alcohol use. Similarly, factors such as group identity or social reinforcement (Brechwald & Prinstein, 2011) also could be critical in investigating which peers are most influential. Thus, a broader focus or consideration of other potential key variables would serve to identify key variables in the peer influence process. Prior research on these factors, however, has focused on either adolescent populations or college drinkers in general. This leaves a significant gap in understanding moderators of drinking buddy relationships.

Limitations

The current findings should be interpreted with consideration of several limitations. First, data were collected via a cross-sectional survey at a single timepoint. Given the study design, directionality of relationships cannot be inferred. Research and theory both suggest that processes of both selection and socialization work in concordance to create drinking behavior (Becker & Curry, 2014; Burk et al., 2012; Kiuru et al., 2010). As such, the present study is unable to attribute findings exclusively to socialization.

Another limitation is that data were analyzed using a between-subjects design, where peer and relationship moderators were aggregated across drinking buddies. For example, the "popularity" score for any one participant did not reflect each unique peer's popularity level. It was instead indicative of the average popularity score across all of their drinking buddies. Consequently, unique variance was lost to this calculation. In addition, because moderators were aggregated across drinking buddies, participants who reported no drinking buddies or did not complete all details for identified peers (37%, *n*=75) were excluded from analyses. Given that drinking buddy literature suggests that individuals with fewer drinking buddies in their network report drinking less (Reifman et al., 2006), perhaps excluding these participants from data analysis failed to capture factors (e.g., participants without drinking buddies could have higher drinking refusal self-efficacy) that may be protective against drinking outcomes. Unsurprisingly, in examining participants with no drinking buddies, our data suggests that, on average, individuals endorsing zero drinking buddies drank less, had fewer drinking consequences, and scored higher on DRSE and lower on positive alcohol expectancies. In addition, when we maintained these participants' data in our sample, the proportion of drinking buddies in one's network significantly predicted both drinking quantity and drinking consequences (but not

frequency) at the $p<.001$ level—a link that was not present after filtering out these participants. As such, it appears that truncating our sample to those with drinking buddies only may have limited our ability to detect significant relationships.

Another possible limitation is that data collection on drinking buddies was restricted to exclusively peers. While previous research supports that drinking buddies tend to be primarily friends (Lau-Barraco & Linden, 2014), this fails to acknowledge other salient social influences, including family members and romantic partners. This methodology may also serve to explain our surprisingly null findings linking the proportion of drinking buddies in one's network and alcohol outcomes. Prior drinking buddy research indicates that family member and romantic partners can be influential on individual drinking (Kehayes et al., 2019; Neighbors et al., 2019). Consequently, the full scope of drinking buddies in one's social network may not have been assessed. Future work may benefit from conceptualizing drinking buddies more broadly to include social network members outside of peers alone.

Finally, caution should be exercised in generalizing our findings. Our data were collected from an undergraduate sample of students enrolled in psychology courses, which may have not reflected the habits and drinking of the general college student population. This is particularly given the high proportion of female and white participants in our sample. Research suggests that there are differences in drinking amongst different sexes (Salvatore et al., 2017) and racial groups (Vaeth et al., 2017), which limits the generalizability of our findings. Similarly, students at the institution where data was collected are characterized by greater ethnic/racial and socioeconomic diversity, and are often first-generation college students. In addition, students are primarily commuters that live at home rather than on-campus. These unique characteristics may suggest less social drinking in general, and may be less reflective of other undergraduate

samples. Finally, , participants were compensated with Sona credit, a form of credit for psychology courses in exchange for student completion. Thus, the generalizability of our findings to beyond undergraduate psychology students incentivized by credit is limited.

In summary, the current investigation sought to examine moderators of the drinking buddy-drinking association by examining characteristics of the individual, the drinking buddy, and their relationship. Our study addressed a gap in extant literature on drinking buddies by examining under what conditions these particularly risky peers exert their influence on personal drinking. Results indicated that greater descriptive norms strengthened the impact of drinking buddy in one's network on individual drinking—but no other moderations emerged. Findings may be utilized to inform future alcohol interventions, particularly in the context of risky social network drinking buddies.

REFERENCES

Adan, A., Forero, D. A., & Navarro, J. F. (2017). Personality traits related to binge drinking: A systematic review. *Frontiers in psychiatry*, *8*, 134.

Adams, C. E., & Nagoshi, C. T. (1999). Changes Over One Semester in Drinking Game Playing and Alcohol Use and Problems in a College Student Sample. *Substance Abuse, 20*(2), 97–106. https://doi.org/10.1023/A:1021468400635

Ahn, L. V., Blum, M., Hopper, N. J., & Langford, J. (2003, May). CAPTCHA: Using hard AI problems for security. In *International conference on the theory and applications of cryptographic techniques* (pp. 294-311). Springer, Berlin, Heidelberg.

Alexander, A. C., & Ward, K. D. (2018). Understanding postdisaster substance use and psychological distress using concepts from the self-medication hypothesis and social cognitive theory. *Journal of psychoactive drugs*, *50*(2), 177-186.

Allen, J., Chango, J., Szwedo, D., Schad, M., & Marston, E. (2012). Predictors of Susceptibility to Peer Influence Regarding Substance Use in Adolescence. *Child Development, 83*(1), 337-350.

Allen, J. P., Porter, M. R., & McFarland, C. F. (2006). Leaders and followers in adolescent close friendships: Susceptibility to peer influence as a predictor of peer pressure, risky behavior, and depression. *Development & Psychopathology, 18,* 155–172.

Allen, J. P., Porter, M. R., McFarland, C. F., Marsh, P. A., & McElhaney, K. B. (2005). The two faces of adolescents' success with peers: Adolescent popularity, social adaptation, and deviant behavior. *Child Development, 76,* 747–760.

American Psychological Association. (2017). *Ethical principles of psychologists and code of conduct* (2002, amended effective June 1, 2010, and January 1, 2017). Retrieved from

https://www.apa.org/ethics/code/

Anthenien, A. M., Lembo, J., & Neighbors, C. (2017). Drinking motives and alcohol outcome expectancies as mediators of the association between negative urgency and alcohol consumption. *Addictive behaviors*, *66*, 101-107.

Bachrach, R. L., & Read, J. P. (2017). Peer alcohol behavior moderates within-level associations between posttraumatic stress disorder symptoms and alcohol use in college students. *Psychology of Addictive Behaviors*, *31*, 576–588. https://doi.org/10.1037/adb0000285

Baer, J. S. (1994). Effects of college residence on perceived norms for alcohol consumption: An examination of the first year in college. *Psychology of Addictive Behaviors*, *8*, 43–50. https://doi.org/10.1037/0893-164X.8.1.43

Baer, J. S., Stacy, A., & Larimer, M. (1991). Biases in the perception of drinking norms among college students. *Journal of Studies on Alcohol*, *52*(6), 580–586. https://doi.org/10.15288/jsa.1991.52.580

Ball, K., MacFarlane, A., Crawford, D., Savige, G., Andrianopoulos, N., & Worsley, A. (2009). Can social cognitive theory constructs explain socio-economic variations in adolescent eating behaviours? A mediation analysis. *Health education research*, *24*(3), 496-506.

Bámaca, M.Y., & Umana-Taylor, A.J. (2006). Testing a model of resistance to peer pressure among mexican-origin adolescents. *Journal of Youth and Adolescence, 35,* 631– 645; doi: 10.1007/s10964-006-9055-4.

Bandura, A., & National Inst of Mental Health. (1986). *Social foundations of thought and action: A social cognitive theory.* Prentice-Hall, Inc.

Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Prentice Hall: Englewood cliffs.

Bandura, A., Caprara, G. V., Barbaranelli, C., Gerbino, M., & Pastorelli, C. (2003). Role of Affective Self-Regulatory Efficacy in Diverse Spheres of Psychosocial Functioning. *Child Development*, *74*(3), 769–782. https://doi.org/10.1111/1467-8624.00567

Barnett, N. P., Ott, M. Q., Rogers, M. L., Loxley, M., Linkletter, C., & Clark, M. A. (2014). Peer associations for substance use and exercise in a college student social network. *Health Psychology*, *33*(10), 1134–1142. https://doi.org/10.1037/a0034687

Bartolo, M. G., Palermiti, A. L., Servidio, R., Musso, P., Tenuta, F., Amendola, M. F., Costabile, A., & Inguglia, C. (2022). The Relationship between Parental Monitoring, Peer Pressure, and Motivations for Responsible Drinking among Italian Adolescents: The Mediating Role of Positive Alcohol Expectancies. *The Journal of Genetic Psychology*, *0*(0), 1–19. https://doi.org/10.1080/00221325.2022.2113026

Beck, K. H., Caldeira, K. M., Vincent, K. B., & Arria, A. M. (2013). Social contexts of drinking and subsequent alcohol use disorder among college students. *The American Journal of Drug and Alcohol Abuse*, *39*(1), 38-43.

Becker, S. J., & Curry, J. F. (2014). Testing the effects of peer socialization versus selection on alcohol and marijuana use among treated adolescents. *Substance use & misuse*, *49*(3), 234-242.

Bekman, N. M., Goldman, M. S., Worley, M. J., & Anderson, K. G. (2011). Pre-adolescent alcohol expectancies: Critical shifts and associated maturational processes. *Experimental and Clinical Psychopharmacology*, *19*(6), 420–432. https://doi.org/10.1037/a0025373

Borsari, B. (2004). DRINKING GAMES: Drinking Games in the College Environment: A Review. *Journal of Alcohol and Drug Education*, *48*(2), 29–51.

Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the

research. *Journal of Substance Abuse*, *13*(4), 391–424. https://doi.org/10.1016/S0899-3289(01)00098-0

Borsari, B., & Carey, K. B. (2003). Descriptive and injunctive norms in college drinking: A meta-analytic integration. *Journal of Studies on Alcohol*, *64*(3), 331–341. https://doi.org/10.15288/jsa.2003.64.331

Borsari, B., & Carey, K. B. (2006). How the quality of peer relationships influences college alcohol use. *Drug and Alcohol Review*, *25*(4), 361–370. https://doi.org/10.1080/09595230600741339

Bot, S. M., Engels, R. C., Knibbe, R. A., & Meeus, W. H. (2005). Friend's drinking behaviour and adolescent alcohol consumption: The moderating role of friendship characteristics. *Addictive behaviors*, *30*(5), 929-947.

Brechwald, W. A., & Prinstein, M. J. (2011). Beyond Homophily: A Decade of Advances in Understanding Peer Influence Processes. *Journal of Research on Adolescence*, *21*(1), 166–179. https://doi.org/10.1111/j.1532-7795.2010.00721.x

Buckner, J. D., Ecker, A. H., & Proctor, S. L. (2011). Social anxiety and alcohol problems: The roles of perceived descriptive and injunctive peer norms. *Journal of Anxiety Disorders*, *25*(5), 631–638. https://doi.org/10.1016/j.janxdis.2011.02.003

Burk, W. J., van der Vorst, H., Kerr, M., & Stattin, H. (2012). Alcohol Use and Friendship Dynamics: Selection and Socialization in Early-, Middle-, and Late-Adolescent Peer Networks. *Journal of Studies on Alcohol and Drugs*, *73*(1), 89–98. https://doi.org/10.15288/jsad.2012.73.89

Burke, R. S., & Stephens, R. S. (1999). Social anxiety and drinking in college students: A social cognitive theory analysis. *Clinical Psychology Review*, *19*(5), 513–530.

https://doi.org/10.1016/S0272-7358(98)00058-0

Carey, K. B., Durney, S. E., Shepardson, R. L., & Carey, M. P. (2015). Incapacitated and forcible rape of college women: Prevalence across the first year. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, *56*(6), 678–680. https://doi.org/10.1016/j.jadohealth.2015.02.018

Carpenter, R. W., & Merrill, J. E. (2021). How much and how fast: Alcohol consumption patterns, drinking-episode affect, and next-day consequences in the daily life of underage heavy drinkers. *Drug and alcohol dependence*, *218*, 108407. https://doi-org.proxy.lib.odu.edu/10.1016/j.drugalcdep.2020.108407

Carrasco, J. A., Hogan, B., Wellman, B., & Miller, E. J. (2008). Collecting social network data to study social activity-travel behavior: an egocentric approach. *Environment and Planning B: Planning and Design*, *35*(6), 961-980.

Chen, W. L., & Chen, J. H. (2020). College fields of study and substance use. *BMC public health*, *20*(1), 1-11.

Child, S., & Nind, M. (2013). Sociometric methods and difference: A force for good – or yet more harm. *Disability & Society*, *28*(7), 1012–1023. https://doi.org/10.1080/09687599.2012.741517

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*(6), 1015–1026. https://doi.org/10.1037/0022-3514.58.6.1015

Cillessen, A. H., & Rose, A. J. (2005). Understanding popularity in the peer system. *Current Directions in Psychological Science*, *14*(2), 102-105.

Coesens, C., De Mol, J., De Bourdeaudhuij, I., & Buysse, A. (2010). The Role of Interpersonal Influence in Families in Understanding Children's Eating Behavior: A Social Relations Model Analysis. *Journal of Health Psychology, 15*(8), 1267–1278. https://doi.org/10.1177/1359105310369187

Cohen, G. L., & Prinstein, M. J. (2006). Peer contagion of aggression and health risk behavior among adolescent males: An experimental investigation of effects on public conduct and private attitudes. *Child development*, *77*(4), 967-983.

Collins, R. L., Parks, G. A., & Marlatt, G. A. (1985). Social determinants of alcohol consumption: the effects of social interaction and model status on the self-administration of alcohol. *Journal of consulting and clinical psychology*, *53*(2), 189.

Cook, W. L., & Kenny, D. A. (2004). Application of the social relations model to family assessment. *Journal of Family Psychology*, *18*(2), 361.

Cox, M. J., DiBello, A. M., Meisel, M. K., Ott, M. Q., Kenney, S. R., Clark, M. A., & Barnett, N. P. (2019). Do misperceptions of peer drinking influence personal drinking behavior? Results from a complete social network of first-year college students. *Psychology of Addictive Behaviors*, *33*, 297–303. https://doi.org/10.1037/adb0000455

Cullum, J., O'Grady, M.A., Sandoval, P., Armeli, S., & Tennen, H. (2013). Ignoring Norms with a Little Help from My Friends: Social Support Reduces Normative Influence on Drinking Behavior. *Journal of social and clinical psychology, 32 1*, 17-33.

Dandurand, C., & Lafontaine, M.-F. (2013). Intimacy and Couple Satisfaction: The Moderating Role of Romantic Attachment. *International Journal of Psychological Studies*, *5*(1), p74. https://doi.org/10.5539/ijps.v5n1p74

DeLay, D., Burk, W. J., & Laursen, B. (2022). Assessing peer influence and susceptibility to

peer influence using individual and dyadic moderators in a social network context: The case of adolescent alcohol misuse. *International journal of behavioral development*, *46*(3), 208-221.

Demir, M., Özdemir, M., & Weitekamp, L. A. (2007). Looking to happy tomorrows with friends: Best and close friendships as they predict happiness. *Journal of Happiness Studies*, *8*(2), 243–271. https://doi.org/10.1007/s10902-006-9025-2

Dennis, S. A., Goodson, B. M., & Pearson, C. A. (2020). Online Worker Fraud and Evolving Threats to the Integrity of MTurk Data: A Discussion of Virtual Private Servers and the Limitations of IP-Based Screening Procedures. *Behavioral Research in Accounting*, *32*(1), 119–134. https://doi.org/10.2308/bria-18-044

DiGuiseppi, G. T., Meisel, M. K., Balestrieri, S. G., Ott, M. Q., Cox, M. J., Clark, M. A., & Barnett, N. P. (2018). Resistance to peer influence moderates the relationship between perceived (but not actual) peer norms and binge drinking in a college student social network. *Addictive Behaviors*, *80*, 47–52. https://doi.org/10.1016/j.addbeh.2017.12.020

Dijkstra, J. K., & Gest, S. D. (2015). Peer norm salience for academic achievement, prosocial behavior, and bullying: Implications for adolescent school experiences. *The Journal of Early Adolescence*, *35*(1), 79-96.

Dijkstra, A., Sweeney, L., & Gebhardt, W. (2001). Social cognitive determinants of drinking in young adults: Beyond the alcohol expectancies paradigm. *Addictive Behaviors*, *26*(5), 689-706.

Dotson, K. B., Dunn, M. E., & Bowers, C. A. (2015). Stand-alone personalized normative feedback for college student drinkers: A meta-analytic review, 2004 to 2014. *PloS one*, *10*(10), e0139518.

Duell, N., Clayton, M. G., Telzer, E. H., & Prinstein, M. J. (2022). Measuring peer influence susceptibility to alcohol use: Convergent and predictive validity of a new analogue assessment. *International journal of behavioral development*, *46*(3), 190–199. https://doi-org.proxy.lib.odu.edu/10.1177/0165025420965729

Dumas, T. M., Davis, J. P., Merrin, G. J., Puccia, M., & Blustein, D. (2018). If you're high status and you know it: Teasing apart the within- and between-person effects of peer- and self-reported status in the drinking group on alcohol-related outcomes. *Psychology of Addictive Behaviors*, *32*(3), 327. https://doi.org/10.1037/adb0000352

Dumas, T. M., Davis, J. P., & Neighbors, C. (2019). How much does your peer group really drink? Examining the relative impact of overestimation, actual group drinking and perceived campus norms on university students' heavy alcohol use. *Addictive Behaviors*, *90*, 409–414. https://doi.org/10.1016/j.addbeh.2018.11.041

Dumas, T. M., Graham, K., Bernards, S., & Wells, S. (2014). Drinking to reach the top: Young adults' drinking patterns as a predictor of status within natural drinking groups. *Addictive Behaviors*, *39*(10), 1510–1515. https://doi.org/10.1016/j.addbeh.2014.05.019

Dumas, T. M., Wells, S., Flynn, A., Lange, J. E., & Graham, K. (2014). The Influence of Status on Group Drinking by Young Adults: A Survey of Natural Drinking Groups on Their Way To and From Bars. *Alcoholism: Clinical and Experimental Research*, *38*(4), 1100–1107. https://doi.org/10.1111/acer.12314

Ehret, P. J., Ghaidarov, T. M., & LaBrie, J. W. (2013). Can you say no? Examining the relationship between drinking refusal self-efficacy and protective behavioral strategy use on alcohol outcomes. *Addictive Behaviors*, *38*(4), 1898–1904. https://doi.org/10.1016/j.addbeh.2012.12.022

Engels, R. C., Wiers, R., Lemmers, L. E. X., & Overbeek, G. (2005). Drinking motives, alcohol expectancies, self-efficacy, and drinking patterns. *Journal of drug education*, *35*(2), 147-166.

Erol, A., & Karpyak, V. M. (2015). Sex and gender-related differences in alcohol use and its consequences: Contemporary knowledge and future research considerations. *Drug and Alcohol Dependence*, *156*, 1–13. https://doi.org/10.1016/j.drugalcdep.2015.08.023

Eveland, W. P., & Kleinman, S. B. (2013). Comparing General and Political Discussion Networks Within Voluntary Organizations Using Social Network Analysis. *Political Behavior*, *35*(1), 65–87. https://doi.org/10.1007/s11109-011-9187-4

Fallu, J. S., Brière, F. N., Vitaro, F., Cantin, S., & Borge, A. I. (2011). The influence of close friends on adolescent substance use: Does popularity matter?. *Jahrbuch Jugendforschung*, 235-262.

Fite, P. J., Colder, C. R., & O'Connor, R. M. (2006). Childhood behavior problems and peer selection and socialization: Risk for adolescent alcohol use. *Addictive Behaviors*, *31*(8), 1454–1459. https://doi.org/10.1016/j.addbeh.2005.09.015

Flannery, D. J., Vazsonyi, A. T., Torquati, J., & Fridrich, A. (1994). Ethnic and gender differences in risk for early adolescent substance use. *Journal of youth and adolescence*, *23*(2), 195-213.

Forgeron, P. A., Dick, B. D., Chambers, C., Cohen, J., Lamontagne, C., & Finley, G. A. (2022). Are They Still Friends? Friendship Stability of Adolescents With Chronic Pain: 1-Year Follow-Up. *Frontiers in Pain Research*, *2*, 767236. https://doi.org/10.3389/fpain.2021.767236

Foster, D. W., Yeung, N., & Neighbors, C. (2014). I think I can't: Drink refusal self-efficacy as a

mediator of the relationship between self-reported drinking identity and alcohol use. *Addictive Behaviors*, *39*(2), 461–468. https://doi.org/10.1016/j.addbeh.2013.10.009

Friedkin, N. E., & Johnsen, E. C. (2011). *Social Influence Network Theory: A Sociological Examination of Small Group Dynamics*. Cambridge University Press.

Fujimoto, K., & Valente, T. W. (2012). Decomposing the components of friendship and friends' influence on adolescent drinking and smoking. *Journal of Adolescent Health*, *51*(2), 136-143.

Fuligni, A. J., & Eccles, J. S. (1993). Perceived parent-child relationships and early adolescents' orientation toward peers. *Developmental psychology*, *29*(4), 622.

Galliher, R. V., Welsh, D. P., Rostosky, S. S., & Kawaguchi, M. C. (2004). Interaction and relationship quality in late adolescent romantic couples. *Journal of Social and Personal Relationships*, *21*(2), 203-216.

Gersh, E., Lee, C. M., & McCarty, C. A. (2019). Changes in peer norms as a mediator of reduction in adolescent alcohol use. *Substance use & misuse*, *54*(10), 1611-1617.

Gilles, D. M., Turk, C. L., & Fresco, D. M. (2006). Social anxiety, alcohol expectancies, and self-efficacy as predictors of heavy drinking in college students. *Addictive Behaviors*, *31*(3), 388–398. https://doi.org/10.1016/j.addbeh.2005.05.020

Greer, A. E., Morgan, K., Samuolis, J., Diaz, G., Merighi, J., & Mahoney, P. (2022). An examination of electronic nicotine delivery system use among college students using social cognitive theory. *Journal of American College Health*, *70*(6), 1839-1847

Greguras, G. J., Robie, C., & Born, M. Ph. (2001). Applying the social relations model to self and peer evaluations. *Journal of Management Development*, *20*(6), 508–525. https://doi.org/10.1108/02621710110399792

Griffin, M., Martino, R. J., LoSchiavo, C., Comer-Carruthers, C., Krause, K. D., Stults, C. B., & Halkitis, P. N. (2022). Ensuring survey research data integrity in the era of internet bots. *Quality & Quantity*, *56*(4), 2841–2852. https://doi.org/10.1007/s11135-021-01252-1

Gullo, M. J., Dawe, S., Kambouropoulos, N., Staiger, P. K., & Jackson, C. J. (2010). Alcohol expectancies and drinking refusal self-efficacy mediate the association of impulsivity with alcohol misuse. *Alcoholism: Clinical and Experimental Research*, *34*(8), 1386-1399.

Gullo, M. J., Matveeva, M., Feeney, G. F., Young, R. M., & Connor, J. P. (2017). Social cognitive predictors of treatment outcome in cannabis dependence. *Drug and alcohol dependence*, *170*, 74-81.

Goldman, M. S., Greenbaum, P. E., & Darkes, J. (1997). A confirmatory test of hierarchical expectancy structure and predictive power: Discriminant validation of the Alcohol Expectancy Questionnaire. *Psychological Assessment, 9*(2), 145–157. https://doi.org/10.1037/1040-3590.9.2.145

Haines, M., & Spear, S. F. (1996). Changing the Perception of the Norm: A Strategy to Decrease Binge Drinking among College Students. *Journal of American College Health*, *45*(3), 134–140. https://doi.org/10.1080/07448481.1996.9936873

Halim, A., Hasking, P., & Allen, F. (2012). The role of social drinking motives in the relationship between social norms and alcohol consumption. *Addictive behaviors*, *37*(12), 1335-1341.

Hasking, P., Boyes, M., & Mullan, B. (2015). Reward and Cognition: Integrating Reinforcement Sensitivity Theory and Social Cognitive Theory to Predict Drinking Behavior. *Substance Use & Misuse*, *50*(10), 1316–1324. https://doi.org/10.3109/10826084.2015.1005315

Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation,

moderation, and conditional process modeling [White paper]. Retrieved from https://www.semanticscholar.org/paper/PROCESS-%3A-A-Versatile-Computational-Tool-for-%2C-%2C-1-Hayes/862dd61cccad6b39ffe890557db19a6356bbe8ca

Hingson, R., Heeren, T., Winter, M., & Wechsler, H. (2005). Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18-24: Changes from 1998 to 2001. *Annual Review of Public Health*, *26*, 259–279. https://doi.org/10.1146/annurev.publhealth.26.021304.144652

Hingson, R., Zha, W., & Smyth, D. (2017). Magnitude and Trends in Heavy Episodic Drinking, Alcohol-Impaired Driving, and Alcohol-Related Mortality and Overdose Hospitalizations Among Emerging Adults of College Ages 18–24 in the United States, 1998–2014. *Journal of Studies on Alcohol and Drugs*, *78*(4), 540–548. https://doi.org/10.15288/jsad.2017.78.540

Hunter, R. F., de la Haye, K., Murray, J. M., Badham, J., Valente, T. W., Clarke, M., & Kee, F. (2019). Social network interventions for health behaviours and outcomes: A systematic review and meta-analysis. *PLoS medicine*, *16*(9), e1002890.

Hussong, A. M., Hicks, R. E., Levy, S. A., & Curran, P. J. (2001). Specifying the relations between affect and heavy alcohol use among young adults. *Journal of abnormal psychology*, *110*(3), 449.

Iannotti, R. J., & Bush, P. J. (1992). Perceived vs. actual friends' use of alcohol, cigarettes, marijuana, and cocaine: Which has the most influence?. *Journal of Youth and Adolescence*, *21*(3), 375-389.

Ilgen, M., Tiet, Q., Finney, J., & Moos, R. H. (2006). Self-efficacy, therapeutic alliance, and alcohol-use disorder treatment outcomes. *Journal of studies on alcohol*, *67*(3), 465-472.

Jaccard, J., Blanton, H., & Dodge, T. (2005). Peer influences on risk behavior: an analysis of the effects of a close friend. *Developmental psychology*, *41*(1), 135.

Jang, S. A., Cho, N., & Yoo, J. (2012). Understanding the Antecedents of Korean High School Students' Drinking Refusal Self-Efficacy: Parental Influence, Peer Influence, and Behavior. *Global Journal of Health Science*, *4*(1), 10–21. https://doi.org/10.5539/gjhs.v4n1p10

Jones, L. M., & McCabe, M. P. (2011). The effectiveness of an internet-based psychological treatment program for female sexual dysfunction. *The journal of sexual medicine*, *8*(10), 2781-2792.

Jorgensen, T. D., Forney, K. J., Hall, J. A., & Giles, S. M. (2018). Using modern methods for missing data analysis with the social relations model: A bridge to social network analysis. *Social Networks*, *54*, 26–40. https://doi.org/10.1016/j.socnet.2017.11.002

Kahler, C. W., Hustad, J., Barnett, N. P., Strong, D. R., & Borsari, B. (2008). Validation of the 30-Day Version of the Brief Young Adult Alcohol Consequences Questionnaire for Use in Longitudinal Studies. *Journal of Studies on Alcohol and Drugs*, *69*(4), 611–615. https://doi.org/10.15288/jsad.2008.69.611

Karakos, H. L. (2014). Positive peer support or negative peer influence? The role of peers among adolescents in recovery high schools. *Peabody Journal of Education*, *89*(2), 214-228.

Kehayes, I.-L. L., Mackinnon, S. P., Sherry, S. B., Leonard, K. E., & Stewart, S. H. (2021). The Influence of Drinking Buddies: A Longitudinal Investigation of Drinking Motivations and Drinking Behaviors in Emerging Adults. *Substance Use & Misuse*, *56*(2), 286–296. https://doi.org/10.1080/10826084.2020.1861631

Kenney, S. R., Napper, L. E., & LaBrie, J. W. (2014). Social anxiety and drinking refusal self-

efficacy moderate the relationship between drinking game participation and alcohol-related consequences. *The American Journal of Drug and Alcohol Abuse*, *40*(5), 388–394. https://doi.org/10.3109/00952990.2014.920849

Kenney, S. R., Ott, M., Meisel, M. K., & Barnett, N. P. (2017). Alcohol perceptions and behavior in a residential peer social network. *Addictive Behaviors*, *64*, 143–147. https://doi.org/10.1016/j.addbeh.2016.08.047

Kenny, D. A., & La Voie, L. (1984). The Social Relations Model. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 18, pp. 141–182). Academic Press. https://doi.org/10.1016/S0065-2601(08)60144-6

Kim, Y., & Kuan, G. (2020). Relationship between alcohol consumption and drinking refusal self-efficacy among university students: the roles of sports type and gender. *International journal of environmental research and public health*, *17*(12), 4251.

Kim, H. J., Min, J. Y., Min, K. B., Lee, T. J., & Yoo, S. (2018). Relationship among family environment, self-control, friendship quality, and adolescents' smartphone addiction in South Korea: Findings from nationwide data. *PloS one*, *13*(2), e0190896.

Kiuru, N., Burk, W. J., Laursen, B., Salmela-Aro, K., & Nurmi, J.-E. (2010). Pressure to drink but not to smoke: Disentangling selection and socialization in adolescent peer networks and peer groups. *Journal of Adolescence (London, England.)*, *33*(6), 801–812. https://doi.org/10.1016/j.adolescence.2010.07.006

Kuriakose, N. (2015). PERCENTMATCH: *Stata module to calculate the highest percentage match (near duplicates) between observations.* https://ideas.repec.org/c/boc/bocode/s457984.html

Kuriakose, N., & Robbins, M. (2015). *Don't Get Duped: Fraud through Duplication in Public*

Opinion Surveys (SSRN Scholarly Paper No. 2580502). https://papers.ssrn.com/abstract=2580502

Kwon, K., & Lease, A. M. (2014). Perceived influence of close friends, well-liked peers, and popular peers: Reputational or personal influence? *Journal of Social and Personal Relationships*, *31*(8), 1116–1133. https://doi.org/10.1177/0265407514522887

LaBrie, J. W., Hummer, J. F., Neighbors, C., & Larimer, M. E. (2010). Whose opinion matters? The relationship between injunctive norms and alcohol consequences in college students. *Addictive behaviors*, *35*(4), 343-349.

Lac, A., Handren, L., & Crano, W. D. (2016). Conceptualizing and measuring weekend versus weekday alcohol use: Item response theory and confirmatory factor analysis. *Prevention science*, *17*, 872-881.

Lac, A., & Luk, J. W. (2019). Pathways from positive, negative, and specific alcohol expectancies to weekday and weekend drinking to alcohol problems. *Prevention science*, *20*, 800-809

Laninga-Wijnen, L., Harakeh, Z., Steglich, C., Dijkstra, J. K., Veenstra, R., & Vollebergh, W. (2017). The norms of popular peers moderate friendship dynamics of adolescent aggression. *Child development*, *88*(4), 1265-1283.

Lansu, T. A. M., Findley-Van Nostrand, D., & Cillessen, A. H. N. (2022). Popularity According to Emerging Adults: What is it, and How to Acquire it. *Emerging Adulthood*, 21676968211066668. https://doi.org/10.1177/21676968211066668

LaMorte, W. W. (2019, September 9). Behavioral change models. The Social Cognitive Theory. Retrieved August 1, 2022, from https://sphweb.bumc.bu.edu/otlt/mph-modules/sb/behavioralchangetheories/behavioralchangetheories5.html

Larimer, M. E., Turner, A. P., Mallett, K. A., & Geisner, I. M. (2004). Predicting drinking behavior and alcohol-related problems among fraternity and sorority members: examining the role of descriptive and injunctive norms. *Psychology of addictive behaviors*, *18*(3), 203.

Lau-Barraco, C., Braitman, A. L., Junkin, E., Glenn, D. J., & Stamates, A. L. (2022). Social network moderators of brief alcohol intervention impact. *Psychology of Addictive Behaviors*, *36*(6), 696–709. https://doi.org/10.1037/adb0000783

Lau-Barraco, C., Braitman, A., Leonard, K., & Padilla, M. (2012). Drinking Buddies and Their Prospective Influence on Alcohol Outcomes: Alcohol Expectancies as a Mediator. *Psychology of Addictive Behaviors*, *26*(4). https://doi.org/10.1037/a0028909

Lau-Barraco, C., Braitman, A. L., Linden-Carmichael, A. N., & Stamates, A. L. (2016). Differences in weekday versus weekend drinking among nonstudent emerging adults. *Experimental and Clinical Psychopharmacology*, *24*(2), 100–109. https://doi.org/10.1037/pha0000068

Lau-Barraco, C., & Collins, R. L. (2011). Social networks and alcohol use among nonstudent emerging adults: A preliminary study. *Addictive Behaviors*, *36*(1), 47–54. https://doi.org/10.1016/j.addbeh.2010.08.017

Lau-Barraco, C., & Linden, A. N. (2014). Drinking buddies: Who are they and when do they matter? *Addiction Research & Theory*, *22*(1), 57–67. https://doi.org/10.3109/16066359.2013.772585

Laursen, B., Hafen, C. A., Kerr, M., & Stattin, H. (2012). Friend influence over adolescent problem behaviors as a function of relative peer acceptance: To be liked is to be emulated. Journal of *Abnormal Psychology, 121*(1), 88–94.

Lawyer, S., Resnick, H., Bakanic, V., Burkett, T., & Kilpatrick, D. (2010). Forcible, drug-facilitated, and incapacitated rape and sexual assault among undergraduate women. *Journal of American College Health: J of ACH*, *58*(5), 453–460. https://doi.org/10.1080/07448480903540515

Lease, A. M., Kwon, K., Lovelace, M., & Huang, H. (2020). Peer Influence in Elementary School: The Importance of Assessing the Likeability of Popular Children. *The Journal of Genetic Psychology*, *181*(2–3), 95–110. https://doi.org/10.1080/00221325.2020.1730744

Leatherdale, S. T., Brown, K. S., Cameron, R., & McDonald, P. W. (2005). Social modeling in the school environment, student characteristics, and smoking susceptibility: A multi-level analysis. *Journal of Adolescent Health*, *37*(4), 330–336. https://doi.org/10.1016/j.jadohealth.2004.10.008

Lee, C. M., Atkins, D. C., Cronce, J. M., Walter, T., & Leigh, B. C. (2015). A daily measure of positive and negative alcohol expectancies and evaluations: Documenting a two-factor structure and within-and between-person variability. *Journal of Studies on Alcohol and Drugs*, *76*(2), 326-335.

Lee, C. M., Geisner, I. M., Lewis, M. A., Neighbors, C., & Larimer, M. E. (2007). Social motives and the interaction between descriptive and injunctive norms in college student drinking. *Journal of studies on alcohol and drugs*, *68*(5), 714-721.

Lee, N. K., Greely, J., & Oei, T. P. (1999). The relationship of positive and negative alcohol expectancies to patterns of consumption of alcohol in social drinkers. *Addictive behaviors*, *24*(3), 359-369.

Lee, M. J., Schick-Makaroff, K., & Kunyk, D. (2021). Frequency of Binge Drinking and Perception of Peer Alcohol Use: A Survey of University Students in a Western Canadian

Province. *Journal of Addictions Nursing*, *32*(2), 132–140. https://doi.org/10.1097/JAN.0000000000000400

Leigh, B. C., & Stacy, A. W. (1993). Alcohol outcome expectancies: Scale construction and predictive utility in higher order confirmatory models. *Psychological Assessment, 5*, 216–229. https://doi.org/10.1037/1040-3590.5.2.216

Leigh, B. C., & Stacy, A. W. (2004). Alcohol expectancies and drinking in different age groups. *Addiction*, *99*(2), 215–227. https://doi.org/10.1111/j.1360-0443.2003.00641.x

Leonard, K. E., & Homish, G. G. (2008). Predictors of heavy drinking and drinking problems over the first 4 years of marriage. *Psychology of Addictive Behaviors*, *22*(1), 25–35. https://doi.org/10.1037/0893-164X.22.1.25

Leonard, K. E., & Mudar, P. (2003). Peer and partner drinking and the transition to marriage: a longitudinal examination of selection and influence processes. *Psychology of addictive behaviors*, *17*(2), 115.

Leonard, K. E., Kearns, J., & Mudar, P. (2000). Peer networks among heavy, regular and infrequent drinkers prior to marriage. *Journal of Studies on Alcohol*, *61*(5), 669–673. https://doi.org/10.15288/jsa.2000.61.669

Leung, R. K., Toumbourou, J. W., & Hemphill, S. A. (2014). The effect of peer influence and selection processes on adolescent alcohol use: A systematic review of longitudinal studies. *Health Psychology Review*, *8*(4), 426–457. https://doi.org/10.1080/17437199.2011.587961

Levitt, E. E., Oshri, A., Clifton, A., Stout, R., Costello, M. J., VanDellen, M., Kelly, J. F., & MacKillop, J. (2020). Psychometric Validation of the Brief Alcohol Social Density Assessment in an Adult Community Sample. *Alcoholism: Clinical and Experimental*

Research, *44*(1), 212–218. https://doi.org/10.1111/acer.14227

Lewis, M. A., Litt, D. M., & Neighbors, C. (2015). The chicken or the egg: Examining temporal precedence among attitudes, injunctive norms, and college student drinking. *Journal of studies on alcohol and drugs*, *76*(4), 594-601.

Lindgren, K. P., Neighbors, C., Teachman, B. A., Wiers, R. W., Westgate, E., & Greenwald, A. G. (2013). I drink therefore I am: Validating alcohol-related implicit association tests. *Psychology of Addictive Behaviors*, *27*(1), 1–13. https://doi.org/10.1037/a0027640

Litt, D. M., Stock, M. L., & Lewis, M. A. (2012). Drinking to fit in: Examining the need to belong as a moderator of perceptions of best friends' alcohol use and related risk cognitions among college students. *Basic and Applied Social Psychology, 34*(4), 313-321.

Lubans, D. R., Plotnikoff, R. C., Morgan, P. J., Dewar, D., Costigan, S., & Collins, C. E. (2012). Explaining dietary intake in adolescent girls from disadvantaged secondary schools. A test of Social Cognitive Theory. *Appetite*, *58*(2), 517–524. https://doi.org/10.1016/j.appet.2011.12.012

Maheux, A. J., Evans, R., Widman, L., Nesi, J., Prinstein, M. J., & Choukas-Bradley, S. (2020). Popular peer norms and adolescent sexting behavior. *Journal of Adolescence*, *78*, 62–66. https://doi.org/10.1016/j.adolescence.2019.12.002

Marks, M. J., & Fraley, R. C. (2005). The Sexual Double Standard: Fact or Fiction? *Sex Roles*, *52*(3–4), 175–186. https://doi.org/10.1007/s11199-005-1293-5

Mallett, K.A., Marzell, M., & Turrisi, R. (2011). Is reducing drinking always the answer to reducing consequences in first-year college students? *Journal of studies on alcohol and drugs, 72 2*, 240-6.

Marton, I., Wiener, J., Rogers, M., & Moore, C. (2015). Friendship Characteristics of Children

With ADHD. *Journal of Attention Disorders*, *19*(10), 872–881. https://doi.org/10.1177/1087054712458971

Mason, M. J., Brown, A., & Moore, M. (2019). The accuracy of young adult cannabis users' perceptions of friends' cannabis and alcohol use. *Addictive Behaviors*, *95*, 28-34.

McCabe, S. E., Schulenberg, J. E., Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Kloska, D. D. (2005). Selection and socialization effects of fraternities and sororities on US college student substance use: a multi-cohort national longitudinal study. *Addiction*, *100*(4), 512-524.

McCloskey, L. A., & Stuewig, J. (2001). The quality of peer relationships among children exposed to family violence. *Development and psychopathology*, *13*(1), 83-96.

Meisel, M. K., DiBello, A. M., Balestrieri, S. G., Ott, M. Q., DiGuiseppi, G. T., Clark, M. A., & Barnett, N. P. (2018). An event- and network-level analysis of college students' maximum drinking day. *Addictive Behaviors*, *79*, 189–194. https://doi.org/10.1016/j.addbeh.2017.12.030

Monk, R. L., & Heim, D. (2013). Environmental context effects on alcohol-related outcome expectancies, efficacy, and norms: A field study. *Psychology of Addictive Behaviors*, *27*(3), 814–818. https://doi.org/10.1037/a0033948

Nogueira-Arjona, R., Shannon, T., Kehayes, I. L., Sherry, S. B., Keough, M. T., & Stewart, S. H. (2019). Drinking to keep pace: A study of the moderating influence of extraversion on alcohol consumption similarity in drinking buddy dyads. *Addictive behaviors*, *92*, 69-75.

Oei, T. P. S., & Burrow, T. (2000). Alcohol expectancy and drinking refusal self-efficacy: A test of specificity theory. *Addictive Behaviors*, *25*(4), 499–507. https://doi.org/10.1016/S0306-4603(99)00044-1

Oei, T. P., Hasking, P. A., & Young, R. M. (2005). Drinking refusal self-efficacy questionnaire-revised (DRSEQ-R): a new factor structure with confirmatory factor analysis. *Drug and alcohol dependence*, *78*(3), 297-307.

Oei, T. P., & Jardim, C. L. (2007). Alcohol expectancies, drinking refusal self-efficacy and drinking behaviour in Asian and Australian students. *Drug and alcohol dependence*, *87*(2-3), 281-287.

Oei, T. P. S., & Morawska, A. (2004). A cognitive model of binge drinking: The influence of alcohol expectancies and drinking refusal self-efficacy. *Addictive Behaviors*, *29*(1), 159–179. https://doi.org/10.1016/S0306-4603(03)00076-5

O'Leary, A., Goodhart, F., Jemmott, L. S., & Boccher-Lattimore, D. (1992). Predictors of safer sex on the college campus: A social cognitive theory analysis. *Journal of American College Health*, *40*(6), 254-263.

Olthuis, J. V., Zamboanga, B. L., Martens, M. P., & Ham, L. S. (2011). Social influences, alcohol expectancies, and hazardous alcohol use among college athletes. *Journal of Clinical Sport Psychology*, *5*(1), 24-43.

O'Mealey, M., & Mayeux, L. (2022). Similarities and Differences in Popular Peers in Adolescence and Emerging Adulthood. *The Journal of Genetic Psychology*, *183*(2), 152–168. https://doi.org/10.1080/00221325.2021.2019666

Overbeek, G., Bot, S. M., Meeus, W. H. J., Sentse, M., Knibbe, R. A., & Engels, R. (2011). Where It's At! The Role of Best Friends and Peer Group Members in Young Adults' Alcohol Use. *Journal of Research on Adolescence*, *21*(3), 631–638. https://doi.org/10.1111/j.1532-7795.2010.00696.x

Oyibo, K., & Vassileva, J. (2019). The relationship between personality traits and susceptibility

to social influence. *Computers in Human Behavior*, *98*, 174–188. https://doi.org/10.1016/j.chb.2019.01.032

Paek, H.-J. (2009). Differential Effects of Different Peers: Further Evidence of the Peer Proximity Thesis in Perceived Peer Influence on College Students' Smoking. *Journal of Communication*, *59*(3), 434–455. https://doi.org/10.1111/j.1460-2466.2009.01423.x

Palmqvist, R., & Santavirta, N. (2006). What friends are for: The relationships between body image, substance use, and peer influence among finnish adolescents. *Journal of Youth and Adolescence*, *35*, 203–217.

Park, A., Sher, K. J., & Krull, J. L. (2008). Risky drinking in college changes as fraternity/sorority affiliation changes: a person-environment perspective. *Psychology of addictive behaviors : journal of the Society of Psychologists in Addictive Behaviors*, *22*(2), 219–229. https://doi.org/10.1037/0893-164X.22.2.219

Park, S., Kim, H., & Kim, H. (2009). Relationships between parental alcohol abuse and social support, peer substance abuse risk and social support, and substance abuse risk among South Korean adolescents. *Family Therapy*, *36*(1), 49.

Patrick, M.E., Terry-McElrath, Y.M., Evans-Polce, R.J., & Schulenberg, J.E. (2020). Negative alcohol-related consequences experienced by young adults in the past 12 months: Differences by college attendance, living situation, binge drinking, and sex. *Addictive behaviors, 105,* 106320.

Patrick, M. E., Wray-Lake, L., Finlay, A. K., & Maggs, J. L. (2010). The long arm of expectancies: Adolescent alcohol expectancies predict adult alcohol use. *Alcohol & Alcoholism*, *45*(1), 17-24.

Pauley, P. M., & Hesse, C. (2009). The effects of social support, depression, and stress on

drinking behaviors in a college student sample. *Communication Studies*, *60*(5), 493-508.

Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: mental health problems and treatment considerations. *Academic psychiatry*, *39*, 503-511.

Perkel, J. M. (2020). Mischief-making bots attacked my scientific survey. *Nature*, *579*(7798), 461-462.

Perkins, H. W. (2007). Misperceptions of peer drinking norms in Canada: Another look at the "reign of error" and its consequences among college students. *Addictive Behaviors*, *32*(11), 2645–2656. https://doi.org/10.1016/j.addbeh.2007.07.007

Perkins, H. W., Haines, M. P., & Rice, R. (2005). Misperceiving the college drinking norm and related problems: A nationwide study of exposure to prevention information, perceived norms and student alcohol misuse. *Journal of Studies on Alcohol*, *66*(4), 470–478. https://doi.org/10.15288/jsa.2005.66.470

Phua, J. (2011). The influence of peer norms and popularity on smoking and drinking behavior among college fraternity members: A social network analysis. *Social influence*, *6*(3), 153-168.

Pierce, G. R., Sarason, I. G., & Sarason, B. R. (1991). General and relationship-based perceptions of social support: Are two constructs better than one?. *Journal of personality and social psychology*, *61*(6), 1028.

Pittman, L. D., & Richmond, A. (2008). University belonging, friendship quality, and psychological adjustment during the transition to college. The Journal of Experimental Education, 76(4), 343-362.

Poulin, F., Dishion, T. J., & Haas, E. (1999). The peer influence paradox: Friendship quality and

deviancy training within male adolescent friendships. *Merrill-Palmer Quarterly (1982-)*, 42-61.

Pozzar, R., Hammer, M. J., Underhill-Blazey, M., Wright, A. A., Tulsky, J. A., Hong, F., Gundersen, D. A., & Berry, D. L. (2020). Threats of Bots and Other Bad Actors to Data Quality Following Research Participant Recruitment Through Social Media: Cross-Sectional Questionnaire. *Journal of Medical Internet Research*, *22*(10), e23021. https://doi.org/10.2196/23021

Presley, C. A., & Pimentel, E. R. (2006). The introduction of the heavy and frequent drinker: a proposed classification to increase accuracy of alcohol assessments in postsecondary educational settings. Journal of studies on alcohol, 67(2), 324-331.

Prince, M. A., Maisto, S. A., Rice, S. L., & Carey, K. B. (2015). Development of a face-to-face injunctive norms brief motivational intervention for college drinkers and preliminary outcomes. *Psychology of Addictive Behaviors, 29*(4), 825-835. https://doi.org/10.1037/adb0000118

Rancourt, D., & Prinstein, M. J. (2010). Peer status and victimization as possible reinforcements of adolescent girls' and boys' weight-related behaviors and cognitions. *Journal of Pediatric Psychology*, *35*(4), 354-367.

Reid, A. E., & Carey, K. B. (2015). Interventions to reduce college student drinking: State of the evidence for mechanisms of behavior change. *Clinical psychology review*, *40*, 213-224.

Reid, A. E., & Carey, K. B. (2018). Why is social network drinking associated with college students' alcohol use? Focus on psychological mediators. *Psychology of Addictive Behaviors*, *32*(4), 456–465. https://doi.org/10.1037/adb0000374

Reid, A. E., Carey, K. B., Merrill, J. E., & Carey, M. P. (2015). Social network influences on

initiation and maintenance of reduced drinking among college students. *Journal of Consulting and Clinical Psychology, 83*(1), 36–44. https://doi.org/10.1037/a0037634

Reifman, A., Watson, W. K., & McCourt, A. (2006). Social networks and college drinking: Probing processes of social influence and selection. *Personality and Social Psychology Bulletin, 32*(6), 820-832.

Rice, E., & Yoshioka-Maxwell, A. (2015). Social Network Analysis as a Toolkit for the Science of Social Work. *Journal of the Society for Social Work and Research*, *6*(3), 369–383. https://doi.org/10.1086/682723

Russell, A. M., Barry, A. E., & Patterson, M. S. (2020). A comparison of global and egocentric network approaches for assessing peer alcohol use among college students in the United States. *Drug and Alcohol Review*, *39*(7), 984–993. https://doi.org/10.1111/dar.13140

Russell, A. M., Barry, A. E., & Patterson, M. S. (2021). Strategies for measuring peer alcohol use within egocentric network analysis. *Journal of American College Health*, *0*(0), 1–8. https://doi.org/10.1080/07448481.2021.1965144

Russell, A. M., Patterson, M. S., & Barry, A. E. (2021). College Students' Perceptions of Peer Alcohol Use: A Social Network Analytic Approach. *Substance Use & Misuse*, *56*(1), 46–53. https://doi.org/10.1080/10826084.2020.1833929

Salvatore, J. E., Cho, S. B., & Dick, D. M. (2017). Genes, environments, and sex differences in alcohol research. *Journal of studies on alcohol and drugs*, *78*(4), 494-501.

Sasson, H., & Mesch, G. (2014). Parental mediation, peer norms and risky online behavior among adolescents. *Computers in Human Behavior*, *33*, 32–38. https://doi.org/10.1016/j.chb.2013.12.025

Scalici, F., & Schulz, P. J. (2017). Parents' and peers' normative influence on adolescents'

smoking: Results from a Swiss-Italian sample of middle schools students. *Substance Abuse Treatment, Prevention, and Policy*, *12*(1), 5. https://doi.org/10.1186/s13011-017-0089-2

Schafer J. L. (1999). Multiple imputation: a primer. *Statistical methods in medical research*, *8*(1), 3–15. https://doi.org/10.1177/096228029900800102.

Schaefer, D. R., Adams, J & Haas, S. A. (2013). Social Networks and Smoking: Exploring the Effects of Peer Influence and Smoker Popularity Through Simulations. *Health Education & Behavior*, *40*(1_suppl), 24S-32S. https://doi.org/10.1177/1090198113493091

Schaefer, M. T., & Olson, D. H. (1981). Assessing intimacy: The PAIR inventory. *Journal of marital and family therapy*, *7*(1), 47-60.

Schaefer, D. R., Van Woerden, I., Hruschka, D., & Bruening, M. (2021). Finding and Keeping Friends in College and Their Influence on Alcohol Use: A Network Analysis. *Journal of Studies on Alcohol and Drugs*, *82*(1), 121–131. https://doi.org/10.15288/jsad.2021.82.121

Schulenberg, J. E., Patrick, M. E., Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Miech, R. A. (2021). Monitoring the Future National Survey Results on Drug Use, 1975-2020. Volume II, College Students & Adults Ages 19-60. *Institute for Social Research*.

Schunk, D. H., & Pajares, F. (2002). The development of academic self-efficacy. In *Development of achievement motivation* (pp. 15-31). Academic Press.

Scott-Sheldon, L. A. J., Terry, D. L., Carey, K. B., Garey, L., & Carey, M. P. (2012). Efficacy of expectancy challenge interventions to reduce college student drinking: A meta-analytic review. *Psychology of Addictive Behaviors*, *26*(3), 393–405. https://doi.org/10.1037/a0027565

Serewicz, M. C. M. (2008). Toward a triangular theory of the communication and relationships

of in-laws: Theoretical proposal and social relations analysis of relational satisfaction and private disclosure in in-law triads. *Journal of Family Communication*, *8*(4), 264–292. https://doi.org/10.1080/15267430802397161

Shelton, R. C., Lee, M., Brotzman, L. E., Crookes, D. M., Jandorf, L., Erwin, D., & Gage-Bouchard, E. A. (2019). Use of social network analysis in the development, dissemination, implementation, and sustainability of health behavior interventions for adults: A systematic review. *Social science & medicine*, *220*, 81-101.

Simone, M. (2019). Bots started sabotaging my online research. I fought back. STAT News. https://www.statnews.com/2019/11/21/bots-started-sabotaging-my-online-research-i-fought-back/. Accessed 3 Oct 2022.

Smit, K., Voogt, C., Hiemstra, M., Kleinjan, M., Otten, R., & Kuntsche, E. (2018). Development of alcohol expectancies and early alcohol use in children and adolescents: A systematic review. *Clinical Psychology Review*, *60*, 136-146.

Song, E.-Y., Smiler, A. P., Wagoner, K. G., & Wolfson, M. (2012). Everyone Says It's OK: Adolescents' Perceptions of Peer, Parent, and Community Alcohol Norms, Alcohol Consumption, and Alcohol-Related Consequences. *Substance Use & Misuse*, *47*(1), 86–98. https://doi.org/10.3109/10826084.2011.629704

Substance Abuse and Mental Health Services Administration (SAMHSA). *National survey on Drug Use and Health*, 2020. https://www.datafiles.samhsa.gov/dataset/national-survey-drug-use-and-health-2020-nsduh-2020-ds0001

Sweeting, H., & Hunt, K. (2015). Adolescent socioeconomic and school-based social status, smoking, and drinking. *Journal of Adolescent Health*, *57*(1), 37-45.

Talley, A. E., Hughes, T. L., Aranda, F., Birkett, M., & Marshal, M. P. (2014). Exploring

alcohol-use behaviors among heterosexual and sexual minority adolescents: intersections with sex, age, and race/ethnicity. *American journal of public health*, *104*(2), 295-303.

Tan, A. S. L. (2012). Through the drinking glass: An analysis of the cultural meanings of college drinking. *Journal of Youth Studies*, *15*(1), 119–142. https://doi.org/10.1080/13676261.2011.630997

Teitcher, J. E. F., Bockting, W. O., Bauermeister, J. A., Hoefer, C. J., Miner, M. H., & Klitzman, R. L. (2015). Detecting, Preventing, and Responding to "Fraudsters" in Internet Research: Ethics and Tradeoffs. *Journal of Law, Medicine & Ethics*, *43*(1), 116–133. https://doi.org/10.1111/jlme.12200

Teunissen, H. A., Kuntsche, E., Scholte, R. H. J., Spijkerman, R., Prinstein, M. J., & Engels, R. C. M. E. (2016). Friends' drinking norms and male adolescents' alcohol consumption: The moderating role of performance-based peer influence susceptibility. *Journal of adolescence*, *53*, 45–54. https://doi-org.proxy.lib.odu.edu/10.1016/j.adolescence.2016.08.017.

Teunissen, H. A., Spijkerman, R., Prinstein, M. J., Cohen, G. L., Engels, R. C., & Scholte, R. H. (2012). Adolescents' conformity to their peers' pro-alcohol and anti-alcohol norms: The power of popularity. *Alcoholism: Clinical and experimental research*, *36*(7), 1257-1267.

Thomas, P. A., & Hart, K. J. (2022). Third-party perceptions of intimate partner violence victimization in men. *Psychology of Men & Masculinities*. https://doi.org/10.1037/men0000406

Ting, T.-T., Chen, W. J., Liu, C.-Y., Lin, Y.-C., & Chen, C.-Y. (2015). Peer influences on alcohol expectancies in early adolescence: A study of concurrent and prospective predictors in Taiwan. *Addictive Behaviors*, *40*, 7–15.

https://doi.org/10.1016/j.addbeh.2014.08.001

Tracy, E. M., & Johnson, P. J. (2007). Personal social networks of women with co-occurring substance use and mental disorders. *Journal of Social Work Practice in the Addictions*, *7*(1-2), 69-90.

Tracy, E. M., & Whittaker, J. K. (1990). The Social Network Map: Assessing Social Support in Clinical Practice. *Families in Society, 71*(8), 461–470. https://doi.org/10.1177/104438949007100802

Trucco, E. M., Colder, C. R., Bowker, J. C., & Wieczorek, W. F. (2011). Interpersonal goals and susceptibility to peer influence: Risk factors for intentions to initiate substance use during early adolescence. *The Journal of early adolescence*, *31*(4), 526-547.

Turner, J. W., Grube, J. A., & Meyers, J. (2001). Developing an Optimal Match Within Online Communities: An Exploration of CMC Support Communities and Traditional Support. *Journal of Communication, 51*(2), 231–251. https://doi.org/10.1111/j.1460-2466.2001.tb02879.x

Urberg, K. A., Luo, Q., Pilgrim, C., & Degirmencioglu, S. M. (2003). A two-stage model of peer influence in adolescent substance use: Individual and relationship-specific differences in susceptibility to influence. *Addictive Behaviors*, *28*(7), 1243–1256. https://doi.org/10.1016/S0306-4603(02)00256-3

Urberg, K., Goldstein, M. S., & Toro, P. A. (2005). Supportive relationships as a moderator of the effects of parent and peer drinking on adolescent drinking. *Journal of Research on Adolescence, 15*(1), 1-19.

Vaeth, P. A., Wang-Schweig, M., & Caetano, R. (2017). Drinking, alcohol use disorder, and treatment access and utilization among US racial/ethnic groups. *Alcoholism: Clinical and*

Experimental Research, *41*(1), 6-19.

Valente, T. W., Gallaher, P., & Mouttapa, M. (2004). Using Social Networks to Understand and Prevent Substance Use: A Transdisciplinary Perspective. *Substance Use & Misuse*, *39*(10–12), 1685–1712. https://doi.org/10.1081/JA-200033210

van den Berg, Y. H. M., & Cillessen, A. H. N. (2015). Peer status and classroom seating arrangements: A social relations analysis. *Journal of Experimental Child Psychology*, *130*, 19–34. https://doi.org/10.1016/j.jecp.2014.09.007

Van Tyne, K., Zamboanga, B. L., Ham, L. S., Olthuis, J. V., & Pole, N. (2012). Drinking motives as mediators of the associations between alcohol expectancies and risky drinking behaviors among high school students. *Cognitive Therapy and Research*, *36*(6), 756-767.

Varela, A., & Pritchard, M. E. (2011). Peer Influence: Use of Alcohol, Tobacco, and Prescription Medications. *Journal of American College Health, 59*(8), 751–756. https://doi.org/10.1080/07448481.2010.544346

Verster, J. C., Herwijnen, J. van, Olivier, B., & Kahler, C. W. (2009). Validation of the Dutch version of the brief young adult alcohol consequences questionnaire (B-YAACQ). *Addictive Behaviors*, *34*(5), 411–414. https://doi.org/10.1016/j.addbeh.2007.09.013

Visser, L., de Winter, A. F., Veenstra, R., Verhulst, F. C., & Reijneveld, S. A. (2013). Alcohol use and abuse in young adulthood: Do self-control and parents' perceptions of friends during adolescence modify peer influence? The TRAILS study. *Addictive Behaviors, 38*, 2841–2846.

Vitulano, M., Fite, P., & Rathert, J. (2009). Delinquent Peer Influence on Childhood Delinquency: The Moderating Effect of Impulsivity. *Journal of Psychopathology and Behavioral Assessment, 32*(3), 315-322.

Von Ahn, L., Blum, M., Hopper, N., & Langford, J. (2003). Captcha: Telling humans and computers apart automatically. In *Proceedings of eurocrypt*.

von Hippel, P. T. (2018). *How many imputations do you need? A two-stage calculation using a quadratic rule* (arXiv:1608.05406). arXiv. http://arxiv.org/abs/1608.05406

Voogt, C. V., Kuntsche, E., Kleinjan, M., & Engels, R. C. (2014). The effect of the 'What Do You Drink'web-based brief alcohol intervention on self-efficacy to better understand changes in alcohol use over time: Randomized controlled trial using ecological momentary assessment. *Drug and alcohol dependence*, *138*, 89-97.

Wang, Z., Qin, M., Chen, M., & Jia, C. (2017, October). Hiding fast flux botnet in plain email sight. In *International Conference on Security and Privacy in Communication Systems* (pp. 182-197). Springer, Cham.

Ward, R. M., & Guo, Y. (2020). Examining the relationship between social norms, alcohol-induced blackouts, and intentions to blackout among college students. *Alcohol, 86,* 35–41. https://doi.org/10.1016/j.alcohol.2020.03.008

Wardell, J. D., & Read, J. P. (2013). Alcohol expectancies, perceived norms, and drinking behavior among college students: Examining the reciprocal determinism hypothesis. *Psychology of Addictive Behaviors, 27*(1), 191–196. https://doi.org/10.1037/a0030653

Weisz, C., & Wood, L. F. (2005). Social identity support and friendship outcomes: A longitudinal study predicting who will be friends and best friends 4 years later. *Journal of Social and Personal Relationships*, *22*(3), 416-432.

Whitaker, D. J., & Miller, K. S. (2000). Parent-adolescent discussions about sex and condoms:

Impact on peer influences of sexual risk behavior. *Journal of Adolescent research*, *15*(2), 251-273.

Williams, K. L., & Galliher, R. V. (2006). Predicting Depression and Self-Esteem from Social Connectedness, Support, and Competence. *Journal of Social and Clinical Psychology*, *25*(8), 855–874. https://doi.org/10.1521/jscp.2006.25.8.855

Wills, T. A., Pokhrel, P., Morehouse, E., & Fenster, B. (2011). Behavioral and emotional regulation and adolescent substance use problems: a test of moderation effects in a dual-process model. *Psychology of addictive behaviors*, *25*(2), 279.

Wills, T. A., Resko, J. A., Ainette, M. G., & Mendoza, D. (2004). Role of Parent Support and Peer Support in Adolescent Substance Use: A Test of Mediated Effects. *Psychology of Addictive Behaviors*, *18*, 122–134. https://doi.org/10.1037/0893-164X.18.2.122

Witkiewitz, K., Donovan, D. M., & Hartzler, B. (2012). Drink refusal training as part of a combined behavioral intervention: Effectiveness and mechanisms of change. *Journal of Consulting and Clinical Psychology, 80*(3), 440–449. https://doi.org/10.1037/a0026996

Whisman, M. A., & McClelland, G. H. (2005). Designing, testing, and interpreting interactions and moderator effects in family research. *Journal of family psychology*, *19*(1), 111.

Yang, B. (2018). The moderating role of close versus distal peer injunctive norms and interdependent self-construal in the effects of descriptive norms on college drinking. *Health communication*, *33*(6), 762-770.

Yang, C., Davey-Rothwell, M., & Latkin, C. (2013). “Drinking buddies” and alcohol dependence symptoms among African American men and women in Baltimore, MD. *Drug and alcohol dependence*, *128*(1-2), 123-129.

Yang, H.-L., & Tang, J.-H. (2004). Team structure and team performance in IS development: A

social network perspective. *Information & Management*, *41*(3), 335–349. https://doi.org/10.1016/S0378-7206(03)00078-8

Yang, Y., Yang, C., Latkin, C. A., Luan, R., & Nelson, K. E. (2016). Condom use during commercial sex among male clients of female sex workers in Sichuan China: a social cognitive theory analysis. *AIDS and Behavior*, *20*(10), 2309-2317.

Yanovitzky, I., Stewart, L. P., & Lederman, L. C. (2006). Social Distance, Perceived Drinking by Peers, and Alcohol Use by College Students. *Health Communication*, *19*(1), 1–10. https://doi.org/10.1207/s15327027hc1901_1

Yarrish, C., Groshon, L., Mitchell, J. D., Appelbaum, A., Klock, S., Winternitz, T., & Friedman-Wheeler, D. G. (2019). Finding the signal in the noise: Minimizing responses from bots and inattentive humans in online research. *The Behavior Therapist*, *42*(7), 235-242.

Yearwood, K., Vliegen, N., Chau, C., Corveleyn, J., & Luyten, P. (2019). When do peers matter? The moderating role of peer support in the relationship between environmental adversity, complex trauma, and adolescent psychopathology in socially disadvantaged adolescents. *Journal of Adolescence*, *72*, 14–22. https://doi.org/10.1016/j.adolescence.2019.02.001

Yearwood Travezan, K., Vliegen, N., Luyten, P., Chau, C., & Corveleyn, J. (2018). Validation of the Quality of Relationships Inventory in a Peruvian Sample of Adolescents: Associations to Peer Attachment. *Psykhe (Santiago)*, *27*(1), 1–11. https://doi.org/10.7764/psykhe.27.1.1122

Young, R. M., Connor, J. P., Ricciardelli, L. A., & Saunders, J. B. (2006). The role of alcohol expectancy and drinking refusal self-efficacy beliefs in university student drinking. *Alcohol and alcoholism*, *41*(1), 70-75.

Zaikman, Y., Marks, M. J., Young, T. M., & Zeiber, J. A. (2016). Gender role violations and the

sexual double standard. *Journal of homosexuality*, *63*(12), 1608-1629.

APPENDIX A

Screening Survey

To determine if you're eligible for this study, please answer the following questions. Your responses will be kept anonymous.

1. What is your current age? ____
2. What is your biological sex? ____ Male ____ Female ____Prefer not to say
3. What is your gender? ____ Male ____ Female ____Third gender/Non-binary
   _____ Other (Specify) _____Prefer not to say
4. In the past 30 days, standard alcoholic drinks did you have in a single sitting? _____
5. What is your college major? _____
6. How many hours do you spend studying each week? _____

***ONLY* for those who screen through:**

Based on your responses, it appears you are eligible for this survey.

The following survey will ask you about your drinking, your beliefs and attitudes about alcohol, and your friendships. Select "NEXT" to review the informed consent document for this study.

For those who do *NOT* screen through:

Unfortunately, it appears you are not eligible for our study at this time. Thank you for your time.

APPENDIX B

Compensation And Debriefing

Congratulations on completing the survey! Please click the link below and input your Sona ID to receive Sona credit. *You cannot receive Sona credit without completing this step.*

Sona credit link: https://odu.co1.qualtrics.com/jfe/form/SV_emI5PxgmadG21w2

Upon clicking link:

Please respond to the following items. Your personal contact information will not be connected to any other survey responses that you have provided.

1. What is your six-digit SONA ID?

Thank you for your participation! If your participation in this study has caused you concerns, anxiety, or otherwise distressed you, you may want to contact the ODU Counseling Center at (757) 683-4401.

If you have questions about your participation in this study or would like to contact the researcher, please email Cathy Lau-Barraco, PhD, cbarraco@odu.edu.

APPENDIX C

Demographics And Background Questionnaire

It is important to know something about our participants as a whole, so we request some demographic information. Only grouped data will be used, and you will never be identified.

1. What is your current age? ____
2. What is your biological sex?
    - Male
    - Female
    - Prefer not to say
3. What is your gender?
    - Male
    - Female
    - Third gender/Non-binary
    - Other (Specify)
    - Prefer not to say
4. Are you of Hispanic or Latino Descent? (e.g., Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture):
    - Yes
    - No
5. What is your race? (Select all that apply).
    - American Indian or Alaska Native
    - Asian
    - Black or African American
    - Middle Eastern/North African
    - Native Hawaiian or Other Pacific Islander
    - White
    - Other (please specify): _____
1. Where is your current residence?
    - A parent's or relative's home
    - A dormitory, residence hall, or apartment on a college campus
    - A house, apartment, or room (not affiliated with a college/university)
    - A fraternity or sorority house
    - Other: _____ (please specify)
2. What is your relationship status?
    - Single (Never married)
    - Married, or in a domestic partnership
    - Widowed
    - Divorced
    - Separated
3. Are you employed now?
    - YES, part-time only
    - YES, full-time only
    - YES, full and part-time

   - NO
4. Yearly total individual income
   - Under $10,000
   - $10,000 - $20,000
   - $20,001 - $40,000
   - $40,001 - $60,000
   - $60,001 - $80,000
   - $80,000 - $100,000
   - $100,000 or more
5. What is your current class standing in school?
   - College freshman
   - College sophomore
   - College junior
   - College senior
   - Other (specify) _____
6. What is your current GPA? _____ (on a 4.0 scale)
7. Are you affiliated with a Greek organization on campus?
   - YES
   - NO

APPENDIX D

Alcohol Use

ALCOHOL USE

Please think about your typical drinking over the **PAST 3 MONTHS**. On a typical day, how many drinks would you have, and over how many hours would you have them? That is, how many drinks would you typically have on each day in the 3 months? How long (in hours) would a typical drinking occasion last on that day? Use any applicable number, starting with 0, and please note that each space must be filled in.

NOTE: 1 drink = 1 Beer (12 oz.) = 1 Wine Cooler (12 oz.) = 1 Glass of Wine (5 oz.) = 1 Shot of Liquor (1-1.5 oz.) = 1 Mixed Drink (1-1.5 oz. of liquor)

Over the **PAST 3 MONTHS**, on a….

	TYPICAL MONDAY	TYPICAL TUESDAY	TYPICAL WEDNES-DAY	TYPICAL THURS-DAY	TYPICAL FRIDAY	TYPICAL SATURDAY	TYPICAL SUNDAY
NUMBER OF DRINKS							
NUMBER OF HOURS							

APPENDIX E

Alcohol Consequences

Below is a list of things that sometimes happen to people either during, or after they have been drinking alcohol. Next to each item below, please select YES or NO to indicate whether that item describes something that has happened to you **IN THE PAST THREE MONTHS.**

In the **past three months.**...

	NO	YES
1. While drinking, I have said or done embarrassing things.		
2. The quality of my work or schoolwork has suffered because of my drinking.		
3. I have felt badly about myself because of my drinking.		
4. I have driven a car when I knew I had too much to drink to drive safely.		
5. I have had a hangover (headache, sick stomach) the morning after I had been drinking.		
6. I have passed out from drinking.		
7. I have taken foolish risks when I have been drinking.		
8. I have felt very sick to my stomach or thrown up after drinking.		
9. My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.		
10. I have spent too much time drinking.		
11. I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.		
12. I have felt like I needed a drink after I'd gotten up (that is, before breakfast).		
13. I have become very rude, obnoxious or insulting after drinking.		
14. I have woken up in an unexpected place after heavy drinking.		
15. I have found that I needed larger amounts of alcohol to feel any effect, or that I could no longer get high or drunk on the amount that used to get me high or drunk.		
16. I have neglected my obligations to family, work, or school because of drinking.		
17. I often have ended up drinking on nights when I had planned not to drink.		
18. When drinking, I have done impulsive things that I regretted later.		
19. I have often found it difficult to limit how much I drink.		
20. My drinking has gotten me into sexual situations I later regretted.		
21. I've not been able to remember large stretches of time while drinking heavily.		
22. My physical appearance has been harmed by my drinking.		
23. I have been overweight because of drinking.		
24. I have had less energy or felt tired because of my drinking.		

APPENDIX F

Drinking Refusal Self-Efficacy

Directions:
The following items ask you to describe your ability to handle drinking situations. Your answers will be completely anonymous so please try to answer as honestly as you can. The following pages contain a list of situations in which people may find themselves drinking alcohol. Most people find it easier to resist drinking in some of these situations than others. Please select the number beside each statement which best describes how much you could resist drinking in each case.

I am very sure I could NOT resist drinking	I most likely would NOT resist drinking	I probably could NOT resist drinking	I probably could resist drinking	I most likely could resist drinking	I am very sure I could resist drinking
1	2	3	4	5	6

How sure are you that you could resist drinking alcohol…

1. When you are out at dinner	1	2	3	4	5	6
2. When you are playing pool or cards	1	2	3	4	5	6
3. When you are watching TV	1	2	3	4	5	6
4. When you see others drinking	1	2	3	4	5	6
5. When you are uptight	1	2	3	4	5	6
6. When you are angry	1	2	3	4	5	6
7. When you are at a party	1	2	3	4	5	6
8. When someone offers you a drink	1	2	3	4	5	6
9. When you want to look sophisticated	1	2	3	4	5	6
10. When you want to feel more confident	1	2	3	4	5	6
11. When you are bored	1	2	3	4	5	6
12. When you want to look better	1	2	3	4	5	6
13. When you are at lunch	1	2	3	4	5	6
14. When you feel ashamed	1	2	3	4	5	6
15. When you are waiting for someone	1	2	3	4	5	6
16. When you feel restless	1	2	3	4	5	6
17. When you feel frustrated	1	2	3	4	5	6
18. When you want to feel more accepted by friends	1	2	3	4	5	6
19. When you are worried	1	2	3	4	5	6
20. When you feel upset	1	2	3	4	5	6
21. When you feel down	1	2	3	4	5	6
22. When you feel nervous	1	2	3	4	5	6
23. When you are on the way home from work	1	2	3	4	5	6
24. When you feel sad	1	2	3	4	5	6
25. When your spouse or partner is drinking	1	2	3	4	5	6
26. When you are listening to music or reading	1	2	3	4	5	6

27. When your friends are drinking	1	2	3	4	5	6
28. When you are by yourself	1	2	3	4	5	6
29. When you have finished playing a sport	1	2	3	4	5	6
30. When you are at a pub or club	1	2	3	4	5	6
31. When you first arrive home	1	2	3	4	5	6

APPENDIX G

Alcohol Outcome Expectancies

Here is a list of some effects or consequences that some people experience after drinking alcohol. How likely is it that these things happen to <u>you</u> when you drink alcohol? Please select the number that best describes how drinking alcohol would affect you. .

<u>WHEN I DRINK ALCOHOL…</u>

<u>HOW LIKELY IS IT THAT THIS WOULD HAPPEN?</u>

		No chance	Very unlikely	Unlikely	Likely	Very likely	Certain to happen
1.	I am more accepted socially	1	2	3	4	5	6
2.	I enjoy the buzz	1	2	3	4	5	6
3.	I feel good	1	2	3	4	5	6
4.	I have a good time	1	2	3	4	5	6
5.	I feel happy	1	2	3	4	5	6
6.	I am more sexually assertive	1	2	3	4	5	6
7.	It is fun	1	2	3	4	5	6
8.	I am more outgoing	1	2	3	4	5	6
9.	It takes away my negative moods and feelings	1	2	3	4	5	6
10.	I have more desire for sex	1	2	3	4	5	6
11.	It is easier for me to socialize	1	2	3	4	5	6
12.	I feel pleasant physical effects						
13.	I am more sexually responsive	1	2	3	4	5	6
14.	I feel more sociable	1	2	3	4	5	6
15.	I am able to talk more freely	1	2	3	4	5	6
16.	I become more sexually active	1	2	3	4	5	6
17.	I feel less stressed	1	2	3	4	5	6
18.	I am friendlier	1	2	3	4	5	6
19.	I am able to take my mind off my problems	1	2	3	4	5	6

APPENDIX H

Social Network Map

This questionnaire is designed to help us find out who the friends in your social network were during the PAST YEAR. We are interested in *friends* who were important to you in one way or another during the year. Please read the following instructions carefully.

Begin by listing the names of up to 10 friends (First Name, Last Initial) who have been most important to you during the past year.

Add names (First Name, Last Initial) in response to the questions below.

ONLY enter the first initial, last initial of your peer (for example, BG). **If two friends have the same initials, you may need to include the first two letters of their first name** (for example, BeG and BoG). You will be answering follow-up questions about each peer, so make sure you can differentiate between names.

Remember:

- List each name one time only
- Answer according to how things were during the PAST THREE MONTHS.

Now that you have listed your social network, we would like you to answer a series of questions about your perceptions of each person on your list.

1. What is this person's biological sex?
   - Male
   - Female
2. What is this person's age? (in years) _____
3. What racial group best describes this person?
   - American Indian or Alaska Native
   - Asian
   - Black or African American
   - Middle Eastern/North African
   - Native Hawaiian or Other Pacific Islander
   - White
   - Other (please specify): _____
4. During the past year, in what area of your life does this person belong?
   - Household (people with whom you live)
   - Family
   - Word
   - School
   - Organizations (clubs, religious groups, etc.)
   - Friends
   - Neighbors
   - Professionals (agencies or other formal services)

- Other (please specify) _____

5. How long have you known this person (in years)? ____
6. What is this person's education level?
   - Never finished high school
   - High school graduate
   - Some college
   - College degree
   - Professional/graduate degree
7. Over the past year, how often did you see this person?
   - Did not see
   - A few times a year
   - Monthly
   - Weekly
   - Daily
8. What category best describes this person's general drinking pattern during this past year?
   - No drinking at all
   - Light social drinker
   - Moderate social drinker
   - Heavy social drinker
   - Problem drinker
   - Don't know
9. During the past year, on how many days did you drink with this person in a typical 30 day period? ____
10. During the past year, was this person a "drinking buddy"? (A "drinking buddy" is someone that you get together with on a regular basis to do activities that center around drinking, such as going to bars or clubs, etc.)
    - Yes
    - No

APPENDIX I

Descriptive Norms

The following questions have to do with alcohol use for **[FRIEND'S NAME]** . For these questions, please choose the answer that best describes person 1's drinking in the **past 3 months.**

Note, a standard drink is:

Please think about [FRIEND'S NAME]. Think about their typical drinking over the **PAST 3 MONTHS**. On a typical day, how many drinks do you think they have? That is, how many drinks would they usually have on each day of the week in the past year?

Over the PAST 3 MONTHS, on a…

	TYPICAL MONDAY	TYPICAL TUESDAY	TYPICAL WEDNESDAY	TYPICAL THURSDAY	TYPICAL FRIDAY	TYPICAL SATURDAY	TYPICAL SUNDAY
NUMBER OF DRINKS							

APPENDIX J

Injunctive Norms

For each question below, please indicate the extent to which [FRIEND'S NAME] would approve or disapprove of each behavior.

Note, 1 = Strongly Disapprove and 7 = Strongly Approve

1. Drinking alcohol every weekend	1	2	3	4	5	6	7
2. Drinking alcohol daily	1	2	3	4	5	6	7
3. Driving a car after drinking	1	2	3	4	5	6	7
4. Drinking enough alcohol to pass out	1	2	3	4	5	6	7

APPENDIX K

Peer Popularity

Please rate [FRIEND'S NAME] using the following statements.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	This person is popular.	1	2	3	4	5
2.	This person has lots of friends.	1	2	3	4	5
3.	This person is fun at parties.	1	2	3	4	5
4.	People like this person.	1	2	3	4	5
5.	This person would be fun to hang out with.	1	2	3	4	5
6.	This person is physically attractive.	1	2	3	4	5
7.	People listen to this person.	1	2	3	4	5
8.	No one likes this person.	1	2	3	4	5

APPENDIX L

Peer Emotional Intimacy

Please respond to each question as your friendship with [FRIEND'S NAME] is now.

Note, 1 = does not describe me/my friendship at all, 5 = describes me/my friendship very well.

Does not describe me/my friendship at all				**Describes me/my friendship very well**
1	**2**	**3**	**4**	**5**

1. My friend listens to me when I need someone to talk to
2. I can state my feelings without them getting defensive.
3. I often feel distant from my friend.
4. My friend can really understand my hurts and joys.
5. I feel neglected at times by my friend.
6. I sometimes feel lonely when we're together.

APPENDIX M

Peer Support

To answer the following questions, think of the interpersonal relationship that you currently have with [FRIEND'S NAME]. Please answer every question using a scale of 1 (never or not at all) to 4 (always or very much). There are no right or wrong answers, what matters is to answer according to what you think or feel.

		Never or Not at all			Always or Very Much
1.	To what extent could you turn to your friend for advice about problems?	1	2	3	4
2.	To what extent could you count on your friend for help with a problem?	1	2	3	4
3.	To what extent can you count on your friend to help you if a family member very close to you died?	1	2	3	4
4.	If you wanted to go out and do something this evening, how confident are you that this person would be willing to do something with you?	1	2	3	4
5.	To what extent can you count on your friend to listen to you when you are very angry at someone else?	1	2	3	4
6.	To what extent can you really count on your friend to distract you from your worries when you feel under stress?	1	2	3	4

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EDUCATION

Ph.D.	The Virginia Consortium Program in Clinical Psychology	Expected 2026
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BACKGROUND

Karolina Kazlauskaite is a third-year graduate student in the Virginia Consortium Program in Clinical Psychology. She is currently pursuing her M.S. in Psychology, and, in Spring 2024, her Ph.D. in Clinical Psychology. Her research interests revolve around the study of alcohol consumption among college students, with a specific focus on understanding the influence of peers and social networks on drinking attitudes and behaviors.

CONFERENCE PRESENTATIONS

Ayala Guzman, R., Strowger, M., **Kazlauskaite, K.,** Braitman, A. L. (2023, March). *Fear of missing out, social media use, alcohol-related content, and alcohol outcomes among college students*. Poster accepted for presentation at the Collaborative Perspectives on Addiction Annual Meeting, Albuquerque, NM.

Junkin, E., Strowger, M., **Kazlauskaite, K**., Braitman, A. L., & Lau-Barraco, C. (2022, June 25-29). *Covid-19-related changes in close friend descriptive norms and the role of drinking context* [Poster presentation]. Research Society on Alcoholism, Orlando, FL, United States.

Kazlauskaite, K., Glenn, D., & Lau-Barraco, C. (2022, March 23-26). *Moderators of the distress tolerance and drinking association* [Poster presentation]. Southeastern Psychological Association, Hilton Head Island, SC, United States.

Ross, L.T., **Kazlauskaite, K.,** & Murray, L.W. S. (2020, March). Coping with Sexual Assault: Family Support and Mental Illness Symptoms. Poster accepted for presentation at the Southeastern Women's Studies Conference, St. Petersburg, FL.

Ross, L.T., **Kazlauskaite, K.,** & Murray, L.W. S. (2019, April). Coping with Sexual Assault: Family Support and Mental Illness Symptoms. Poster session presented at the annual Student Research and Award Day, College of Charleston, Charleston, SC.