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How the quality of peer relationships influences college alcohol use

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Abstract

Peer relationships are consistently linked to alcohol use in college students. However, this disparate literature often reveals contradictory findings regarding the precise mechanisms of peer influence. In this review, we use an organisational framework based on social learning theory (SLT) to demonstrate how the quality of peer relationships may influence personal alcohol use. We propose that the quality of peer relationships enhance the influence of social reinforcement, modelling and cognitive processes on personal alcohol use. Research indicates that the quality of peer relationships influences drinking via three pathways: the lack or breakdown of quality peer relationships, alcohol use being an integral part of peer interactions, and if peers disapprove of alcohol use or do not drink. This conceptualisation of peer influence informs the consistent finding of gender differences in college student drinking. Limitations of the reviewed research include reliance on cross-sectional surveys, self-report and homogeneous populations. Future directions for research on quality peer relationships involve detailed longitudinal assessment and the application of advanced statistical methods.

Keywords

alcohol; college; peer influence

Introduction

Around the world, alcohol use by college students is consistently a source of concern [1-6]. Although a variety of factors influences college student drinking, peer influence has emerged as one of the most powerful predictors of the initiation [7,8] and maintenance [9,10] of drinking in the college setting. Three aspects of the college environment enhance the influence of peers on alcohol use. First, surrounded by peers and often living away from home, college students experience freedom from parental control, which is often demonstrated by using alcohol in college [6,11]. Secondly, adjustment to college life is a major developmental transition. In this new environment, students will establish, test and refine their new psychological identity [12]. Peer friendships are vital in this process, as they provide first-year students with role models and socialisation opportunities. As a result, the alcohol-related attitudes and behaviours of peers are consistently related to personal attitudes and behaviours, especially during the first year in the college environment [3,11,13]. Thirdly, alcohol is part of the college culture, present

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at most social functions and part of many peer interactions [2,5,14,15]. Many students view college as a place to drink excessively before assuming the responsibilities of adulthood [6, 16], a perception supported by the easy access to alcohol on campus [11]. In addition, the majority of college peers drink more [17] and are more approving of alcohol use [18] than are the student's parents, and heavy drinking peaks during the college years [12,19]. Thus, the student's exposure to alcohol and peer influence in college has been called a 'window of vulnerability' [13].

Social learning perspective on alcohol use

In the past 35 years, peer drinking has been linked consistently to personal alcohol use [20-28]. However, much of this research conceptualises peer influence as a singular, powerful influence on college drinking. Instead, we use a framework based in social learning theory (SLT) to propose that the potency of peer influences is determined by the quality of the peer relationship. Specifically, three SLT constructs describe how peers influence personal alcohol use: social reinforcement, modelling and cognitive processes.

Social reinforcement (or differential reinforcement) refers to receiving consequences for a behaviour dependent on the setting in which it occurs [29]. The different environments in which college drinking occurs provide varying degrees of acceptance of certain behaviours. For example, heavy drinking may be accepted and encouraged at a campus party but frowned upon and punished at a faculty social event. *Modelling* (or vicarious learning) occurs when humans acquire new behaviours through the observation of others, or through verbal or written communication [29]. Behaviours that are rewarded are more likely to be emulated than those that are punished. This process is a central concept of SLT, because it proposes that learning occurs by observing other's behaviours and the resultant positive or negative consequences experienced by others [30]. In addition, perceptions of attitudes and behaviours which are typical and/or approved of by others (e.g. norms) appear to be particularly influential in the context of college drinking [31-35]. For example, watching peers drink provides the college student with information about both how to use alcohol and how other students will react to different levels of drinking (e.g. reward or punish the behaviour). *Cognitive processes* of the individual also contribute to interpersonal influence on drinking. SLT proposes that the environment provides the individual with information that form cognitions (or thoughts), which then determine overt behaviours [29]. Cognitive processes are based on previous experience and are often considered mediators of environmental or social influences on behaviour. Two cognitive processes, self-efficacy and alcohol (or outcome) expectancies, have been related consistently to college student drinking [9,27]. Self-efficacy is the belief that one can initiate a behaviour to obtain a desired outcome (e.g. refuse a drink to remain sober). In college students, lower levels of drink refusal self-efficacy are associated with higher levels of drinking [36-38]. Alcohol expectancies are beliefs about the cognitive, affective or behavioural effects of alcohol use and can be both positive (e.g. 'drinking makes me more sociable') and negative (e.g. 'when I drink, I often say things that I regret later') [39]. Expectancies appear to have both aetiological and maintaining influences on alcohol use in college students [40], especially positive expectancies [39,41].

The concept of *reciprocal determinism* (or triadic reciprocity [42]) illustrates the relationship among the three SLT constructs of social reinforcement, modelling and social cognitions. These three constructs cannot be considered independently; change in one will facilitate changes in the other two. In addition, the relative influences exerted by these constructs are thought to vary in different settings and for different behaviours [30]. Therefore, the influence of these constructs are constantly changing, being adjusted and altered as experience grows. The concept of reciprocal determinism is vital in disentangling the influences of these SLT constructs on personal alcohol use in the college setting.

Review structure

In this review, we illustrate how the quality of peer relationships influences personal alcohol use by altering the potency of the reciprocally related SLT constructs. First, we define the quality of the peer relationship as a function of the stability, intimacy and support provided by peers. Secondly, the quality of peer relationships is shown to facilitate alcohol use through three pathways, thus clarifying the confusing and contradictory research on peer influence on drinking. In each pathway, the quality of peer relationships affects strength and nature of social reinforcement, modelling and/or social cognitions regarding alcohol. Thirdly, we apply this framework to understand gender differences in alcohol use. Specifically, gender moderates the second and third pathways. Finally, we discuss the limitations of the literature and promising avenues for future research.

To organise the vast literature on peer influences on college drinking, three inclusion criteria were used for the review. First, peer-reviewed, published studies were included if they discussed the influence of platonic ‘peers’, ‘friends’, ‘best friends’ or ‘fellow students’ on drinking. Secondly, only research published after 1970 was cited, a decision merited by the increase in the interest and quality experimental evaluation of SLT in the college setting since this time [43]. Thirdly, we excluded studies with major design limitations (e.g. surveys with response rates below the general acceptable standard of 60% [44]) or inappropriate analyses (e.g. conducting regressions with multiple predictors on small samples).

Quality of peer relationships

Research on college friendships reveals three unique components common to platonic, quality peer relationships: stability, intimacy and support. *Stability* has been assessed by examining changes over time in the number of social interactions by the individual and the size of one's peer network [45]. Following an initial period of turnover, the number of friendships appears to stabilise [45-47]. Thus, students make a large number of friends rather quickly, and most long-term friendships emerge from these initial contacts. Same-sex friendships appear to be the most stable [45]. *Intimacy* has been defined as the degree to which one feels interpersonally close with friends [48]. As with stability, intimacy develops over the course of time [49] and proves to be a considerable asset, increasing one's resilience to stress [47] and decreasing loneliness [50,51]. *Support* has been defined as ‘the extent to which the individual is accepted, loved and involved in relationships in which communication is open’ [52, p. 830]. Social support from peers is consistently related to self-confidence and sociability, which can contribute to successful college adaptation [47,53,54]. In addition, students with supportive peer networks exhibit lower levels of psychological problems, stress and depression [47,53, 54-60].

Three pathways of peer influence on alcohol use

Stability, intimacy and support help to define the quality of peer relationships, each contributing to the formation of lasting, influential personal ties. However, research evaluating the connection between peer relationships and personal alcohol use has been inconsistent and contradictory. For example, alcohol use in college students has been linked to both the presence [61-63] and absence [64-65] of social support in their lives. In addition, students have reported drinking heavily in both social [48,66] and solitary [67] drinking settings. Finally, drinking has also been associated by students reporting pleasant times with others, as well as conflict with others [68,69]. Such varied research findings makes it difficult to discern a relationship between peer relationships and drinking. However, we propose that three pathways of peer influence organise this literature relating peers and personal alcohol use (see Fig. 1). Specifically, these three pathways affect the potency of the three SLT constructs on personal alcohol use.

First, a *lack or breakdown* of quality peer relationships can facilitate drinking. The relationship between a breakdown or lack of peer relationships with increased alcohol use is evident in the research linking alcohol use to reduced levels of intimacy with others [65], alienation [67], emotional pain [66], conflict with others [68,69] and low levels of support [62,70-71]. In addition, alcohol use has also been associated with the denial of a need for social affiliations or affection [72] and alienation from others has been linked to increased motives to drink [64]. Solitary drinkers also tend to consume more alcohol than students who drink in social situations [36,65,73].

SLT proposes that this lack of quality peer relationships can result in feelings of isolation or conflict (e.g. emotional pain [73]), which in turn present a challenge in the social environment that the student must attempt to handle [29]. Negative affect and emotions have also been linked to alcohol use in college students [74]. As the student will have little contact with peers, social reinforcement and modelling will have less impact on personal alcohol use. However, an increase in drinking can result if the students' social cognitions (expectancies and self efficacy) facilitate the perception of drinking as a way to handle the lack of stable, intimate and supportive peer relationships. Research indicates a relationship between alcohol use and the lack or breakdown of peer relationships. In a study that required students to record their social interactions and alcohol use three times a day, a problematic cycle was detected in which alcohol was consumed to relieve immediate stress, which was then associated with increased negative affect [75]. This reciprocal relationship was especially prominent in students with less intimate and supportive friendships. Cognitive processes also appear to influence alcohol use in solitary drinkers. Specifically, solitary drinkers exhibit lower self-efficacy to resist drinking and higher alcohol-related expectancies (personal and social coping, personal and social enhancement) than social drinkers [36]. Taken together, this research demonstrates the utility of SLT constructs in explaining the relationship between a lack of quality peer relationships and personal alcohol use.

Secondly, excessive drinking can result if alcohol use becomes an integral part of peer interactions. A recent study, which followed students throughout their college years and then reassessed them 4 and 7 years after graduation, revealed the social environment to be a highly significant predictor for drinking in college [19]. In the context of the SLT construct of social reinforcement, both socialisation and selection contribute to this process. Socialisation is evident when alcohol use becomes prevalent, accepted and encouraged in peer interactions that were previously alcohol-free. Thus, college friendships may initially develop in class or while socialising in contexts that do not involve alcohol. The initiation and development of these friendships have many advantages regarding everyday problems, psychological health [53] and adjustment to college [47,50]. However, the overall prevalence of drinking in college socialisation may increase the likelihood that alcohol will become enmeshed in quality peer relationships. The student is thus regularly exposed to valued peers who both model and provide social reinforcement for alcohol use, probably resulting in increased drinking in social situations [6].

Selection also appears to contribute to the development of quality peer relationships, as students actively seek out contexts which permit excessive drinking. Students report drinking heavily to facilitate contact and acceptance from peers [66,76] and to experience pleasant times with others [68,69,72]. Alcohol use is also used by college students to facilitate intimacy [48,61], closeness [64] and support [63]. Thus, drinking environments can afford the adaptive advantages of social interactions with peers, and help forge quality peer relationships (including stability, intimacy and support) [11,61-63,65,66,77,78]. This, in turn, can lead students to view 'intoxication as a deliberate social activity' [79, p. 155]. Shared drinking experiences, although increasing the risk to the student, can also become associated with positive aspects of the friendship. As a result, students may seek out peers who consume

alcohol. In fact, heavy alcohol use by incoming college students appears to be primarily associated with making friends, and not negative affect or coping [8].

The quality of peer relationships also significantly influences personal alcohol use through the SLT constructs of modelling and social cognitions. Individuals match the alcohol use of a warm and sociable model more than that of a cold or distant model [80,81] and the perceived behaviours of valued peers are more influential on personal use than those of acquaintances or strangers [82]. Regarding social cognitions, expectancies of social facilitation or pleasure [66,83-87] and social assertiveness [88-90] are consistently related to increase social drinking in college students. In addition, college students with low drink refusal self-efficacy also exhibit higher levels of alcohol use [91-94]. Therefore, it is likely that social drinking by students is both modeled and socially reinforced by valued peers, making it difficult for students to refuse offers of alcohol.

Finally, the student is likely to drink lightly or abstain from drinking if his or her *peers disapprove of alcohol use or do not drink*. In the context of SLT, this pathway can be viewed as the opposite of what occurs when peers support heavy alcohol use. Specifically, peers encourage abstinence or light drinking through social reinforcement (providing an environment that approves of this style of alcohol use), modelling (peers abstain or drink lightly themselves) and cognitive processes (strong drink-refusal self-efficacy, low expectancies that alcohol is needed to be social or popular). The little research conducted on light drinkers and abstainers indicates that college students whose peers disapprove of drinking or abstain report very little personal alcohol use [7,26]. In addition, freshmen whose social networks consist mainly or entirely of abstainers are less likely to initiate alcohol use or drink heavily (five or more drinks per occasion) than students whose social networks consist mainly of drinkers [8,95]. Longitudinal research indicates that the alcohol-related attitudes and behaviours of peers are significantly correlated with personal attitudes and behaviours at both low and high levels of alcohol consumption, a relationship that is most probably the result of both selection and socialisation [13,19]. In sum, associating with light drinkers or abstainers can prevent drinking from becoming a prominent part of socialisation.

Taken together, these three pathways explain the vast body of conflicting research on peer influence on personal alcohol use. In the first pathway, the absence or breakdown of peer relationships set the stage for increased alcohol use to cope with social isolation. Social cognitions are especially influential in this pathway. In the second pathway, alcohol use is an integral part of quality peer relationships, with valued peers encouraging alcohol use through social reinforcement and modelling. In the third pathway, the student's susceptibility to excessive drinking is reduced by valued peers encouraging abstinence or light drinking. The latter two pathways account for research linking personal alcohol use, light or heavy, to that of one's peers.

Utility of model: gender differences

This model helps explain the consistent finding that women report lower levels of drinking than men [1,2,5,6,83,96-97]. Although differences in body weight and fat content result in different rates of alcohol metabolism for men and women [98], disparity in the stability, intimacy and support of the peer relationships of women and men contributes to observed gender differences in college drinking. Regarding stability, women express close friendship through physical or verbal affection, while males express intimacy through shared activities with friends [47]. As a result, females tend to talk about people and relationships with one another, while males often talk about objects and activities [99]. Gender differences are also evident in the intimacy of relationships. Intimacy is formed by self-disclosure with friends [100,101]. Although men and women spend similar amounts of time with peers, men's

expression of intimacy tends to be activity-based, while women tend to convey intimacy through self-disclosure [100,102-105]. In addition, men tend to be less intimate and demonstrate less self-disclosure with others than females in same-sex relationships [104, 106], even with best friends [50,107]. Men are also less likely to confide in friends, openly express feelings of vulnerability, demonstrate affection or discuss personal issues [108,109]. This is not to say that men value intimacy less; rather, it is less an integral part of their relationships. Regarding support, men tend to place fewer emotional demands on their friends [103], while women tend to offer and receive more emotional support from their close friends than do men [110]. Thus, the quality of peer relationships manifests itself differently for men and women.

Gender differences in the quality of peer relationships moderates the second and third pathways of peer influence (there is no evidence of gender differences in drinking to cope with the lack or breakdown of peer relationships). This moderation is evident in the three SLT constructs of social reinforcement, modelling and cognitive processes related to alcohol use. Social reinforcement from peers appears to be greater for men than for women in drinking situations. Specifically, social drinking activities appear to be an important context in which men receive support from friends [65], and men view drinking situations as a way to foster intimacy, closeness and support from peers [48,77]. Although men may be cautious and reserved in same-sex friendships [109], these tendencies may be reduced by alcohol use, fostering more self-disclosure and intimacy among friends [48,83]. Disinhibition has been consistently linked with alcohol use in college students [111,112], especially among males [113-115], and moderate drinking (one to four drinks per occasion) is related to *higher* levels of social satisfaction in college men, but not in women [116]. Thus, men may receive significantly more types of support from friends (e.g. emotional, problem-solving) while in the drinking environment than women do. Given these findings, it is not surprising that male freshmen who want to make friends also drink heavily upon arrival at school to facilitate social contact [11]. Thus, men are more likely than women to develop and maintain a set of 'drinking buddies' with whom drinking is a key element of socialisation [48,66].

In contrast, women are less likely than men to use alcohol to foster socialisation and do not appear to develop social networks whose focus is on drinking. For example, the desire for affiliation has been found to significantly predict heavy alcohol use in male freshmen, while the influence of social affiliation on female alcohol use is negligible [77,117]. Furthermore, women at single-sex institutions drink significantly less than women at co-educational schools, despite there being no difference in the number of peers and frequency of socialising [118].

Regarding modelling, although both women and men appear to imitate observed drinking in similar fashion [81], cross-sectional and longitudinal research indicates that drinking is more integrated in the social lifestyle of men than in women [6,40]. For example, the frequency of interactions with peers is a predictor of heavy alcohol use (five or more drinks per occasion) in men: the more men interact with peers, the more alcohol they report consuming [119]. Thus, men have more opportunities to observe others' drinking. Gender differences are also evident in cognitive processes related to drinking. Compared to men, women have higher levels of self-efficacy regarding their alcohol use in social situations [91-94]. Specifically, women appear to be more confident in their ability to refrain from drinking alcohol when with friends. Regarding alcohol-related expectancies, men have greater expectancies of social assertiveness [88-90], social pleasure or facilitation [66,83,84-86] and social lubrication [39] than women. Interestingly, the endorsement of expectancies for sociability is associated with heavy drinking in women [86,120], suggesting that regardless of gender, holding the expectation that alcohol facilitates socialisation may contribute to heavy drinking. However, given the role of drinking in men's socialisation, this relationship is observed more in men.

In sum, in the second and third pathways of the model, gender moderates the effect of quality of peer relationships on personal alcohol use. Alcohol is often used by men to develop a sense of stability, intimacy and support through drinking with peers. As peers become more valued, their influence on the three SLT constructs becomes more pronounced. In contrast, women's everyday interactions with friends of either sex tend to be more supportive [47] and intimate [50] than men's. Women seek to enhance the quality of peer relationships through self-disclosure and sharing multiple activities [103], rather than through alcohol-related activities. This is not to say that women are not affected by the latter two pathways of peer influence; on occasion, women do use alcohol to promote cohesion among friends [80]. Furthermore, this does not imply that women's alcohol use in college is risk-free. Indeed, women in college drink, binge drink (consume five or more drinks on one occasion), and become drunk more often than their peers who do not attend college [121]. However, drinking appears to play less of a central role in women's peer interactions.

Limitations and future directions

This review used social learning theory to organise the literature detailing the relationship between the quality of peer relationships and personal alcohol use. This decision was warranted because SLT offers the most detailed theoretical conceptualisation of peer influences on college drinking, acknowledges the influence of social interactions on behaviour, and does not attempt to explain behaviour exclusively as the result of internal psychological drives or biological determinants [29,30]. That said, there are several other theories that could have been used to explain college student drinking, such as peer cluster theory [122], theory of planned behaviour [123,124] and problem behaviour theory [125,126]. Although none of these theories have received the amount of empirical evaluation as SLT, it is possible that further development of these theories may provide a more comprehensive explanation for the relationship between the quality of peer relationships and alcohol use in the college setting.

Although the quality of the literature on peer influence on college drinking has increased over time, five common limitations apparent in the studies suggest promising future directions for research. First, cross-sectional designs, although providing valuable initial evidence of peer influences, do have considerable limitations [127]. Specifically, it is impossible to determine changes over time in peer influences on personal alcohol use using a single measurement. In addition, cross-sectional research cannot isolate the respective influences of selection and socialisation. Therefore, detailed longitudinal assessment may be most appropriate for advancing knowledge about interactive influences on drinking. For example, diary techniques [128] and ecological momentary assessment [75] allow participants to record several discrete interactions over time. By shortening the period of recall, this approach would reduce the amount of bias. Secondly, all the literature reviewed here relied on participant self-report. Although there is little evidence that students intentionally misrepresent their alcohol use [129], laboratory studies of peer influence would provide valuable information on the specific influences of peers. For example, the influence of modelling in dyads or groups of peers has yet to be examined. Thirdly, much of the research has been performed with Caucasian students at American colleges. Although the past decade has seen an increase in quality international research on peer influence on college student drinking, it would be valuable to evaluate cultural differences in the development and influence of peer relationships on personal alcohol use. Fourthly, the majority of studies included students in introductory psychology research pools. However, information was rarely provided regarding whether this population was representative of the whole student body. Therefore, a selection bias may limit the generalisability of the reviewed research. Finally, almost all of these studies evaluated the participant's perception of peer influence. Future research can directly assess peers in order to fully understand their influence on personal alcohol use. For example, recent research on dyads of close friends found three drinking motives (enhancement, social reinforcement and coping)

to predict alcohol use [130], highlighting the role of reciprocal determinism in the development and maintenance of personal alcohol use. This line of research, in addition to improving our understanding of peer influence, will also inform our attempts to involve peers in interventions addressing college drinking [131].

Future research will also be enhanced by the use of statistical techniques such as hierarchical linear modelling (HLM) [132]. HLM permits the creation of multi-level models that take into account personal behaviours and perceptions, as well as those of the students' peers. With longitudinal data, these multi-level models could explore the reciprocal relationships of SLT constructs at each assessment, as well as changes in their influence over time. Thus, HLM could empirically evaluate all three proposed pathways provided in Fig. 1. For example, a longitudinal model of the second pathway could assess whether the quality of peer relationships influences social reinforcement, modelling, and social cognitions conducive to drinking. Changes in these constructs could then be used to predict subsequent changes in personal alcohol use.

Conclusion

The quality of peer relationships is an important consideration when attempting to understand college drinking. Stable, intimate and supportive peer relationships appear to influence the potency of social reinforcement, modelling and social cognitions on personal alcohol use. Gender differences appear to moderate this effect, as alcohol appears to be less involved in the development and maintenance of quality peer relationships among women than among men. In a larger context, this influence of the quality of peer relationships on personal alcohol use presents a conundrum to researchers and college administrations attempting to reduce drinking on campus, especially among male first-year students. Specifically, these students may decide that the perceived social benefits of drinking (expectancies) may outweigh the risks of problems (e.g. injury, poor grades) or punishments (e.g. administrative referrals, fines) that may occur [28,116]. The challenge will be to foster, through individual interventions or campus-wide initiatives, the development of quality peer relationships that are supportive of moderate drinking or abstinence.

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References

1. Wechsler H, Lee JE, Kuo M, Seibring M, Nelson TF, Lee H. Trends in college binge drinking during a period of increased prevention efforts. *J Am Coll Health* 2002;50:203–17. [PubMed: 11990979]
2. Gill JS. Reported levels of alcohol consumption and binge drinking within the UK undergraduate student population over the last 25 years. *Alcohol Alcohol* 2002;37:109–20. [PubMed: 11912065]
3. Karam EG, Maalouf WE, Ghandour LA. Alcohol use among university students in Lebanon: the IDRAC University Substance Use Monitoring Study (1991 and 1999). *Drug Alcohol Depend* 2004;76:273–86. [PubMed: 15561478]
4. Adelekan ML, Ndom R, Obayan AI. Monitoring trends in substance use through a repeat cross-sectional survey in a Nigerian university. *Drugs Educ Prev Policy* 1996;3:239–47.
5. Kypri K, Langley JD, McGee R, Saunders JB, Williams S. High prevalence, persistent hazardous drinking among New Zealand tertiary students. *Alcohol Alcohol* 2002;37:457–64. [PubMed: 12217938]
6. Roche AM, Watt K. Drinking and university students: from celebration to inebriation. *Drug Alcohol Rev* 1999;18:389–99.
7. Lo CC, Globetti G. A partial analysis of the campus influence on drinking behavior: students who enter college as non-drinkers. *J Drug Issue* 1993;23:715–25.

8. Reifman A, Watson K. Binge drinking during the first semester of college. *J Am Coll Health* 2003;52:73–81. [PubMed: 14765761]
9. Baer JS, Kivlahan DR, Marlatt GA. High-risk drinking across the transition from high school to college. *Alcohol Clin Exp Res* 1995;19:54–61. [PubMed: 7771663]
10. Wood MD, Read JP, Palfai TP, Stevenson JF. Social influence processes and college student drinking: the mediational role of alcohol outcome expectancies. *J Stud Alcohol* 2001;62:32–43. [PubMed: 11271962]
11. Maggs, JL. Alcohol use and binge drinking as goal-directed action during the transition to post-secondary education.. In: Schulenberg, J.; Maggs, JL.; Hurrelman, K., editors. *Health risks and developmental transitions during adolescence*. Cambridge University Press; New York: 1997. p. 345-71.
12. Schulenberg J, Maggs JM. A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *J Stud Alcohol* 2002;(Suppl 14):54–70.
13. Lau RR, Quadrel MJ, Hartman KA. Development and change of young adult's preventative health beliefs and behavior: Influences from parents and peers. *J Health Soc Behav* 1990;31:240–59. [PubMed: 2133479]
14. Thombs, DL. *An introduction to addictive behaviors*. Vol. 2nd edn.. Guilford Press; New York: 1999.
15. Webb E, Ashton CH, Kamali F. Alcohol and drug use in UK university students. *Lancet* 1996;348:922–5. [PubMed: 8843811]
16. Arnett JJ. Emerging adulthood: a theory of development from the late teens through the twenties. *Am Psychol* 2000;55:469–80. [PubMed: 10842426]
17. Leibold J. The relationship between drug and alcohol use and peer group associations of college freshmen as they transition from high school. *J Drug Educ* 1994;24:177–92. [PubMed: 7844692]
18. Johnson PB. Reactions, expectancies, and college student's drinking. *Psychol Rep* 1989;65:1245–6. [PubMed: 2623119]
19. Bartholow BD, Sher KJ, Krull JL. Changes in heavy drinking over the third decade of life as a function of collegiate fraternity and sorority involvement: a prospective, multilevel analysis. *Health Psychol* 2003;22:616–26. [PubMed: 14640859]
20. Parfrey PS. Factors associated with undergraduate alcohol use. *Br J Prev Soc Med* 1974;28:252–7. [PubMed: 4455344]
21. Hanson DJ. Drinking problems: a test of alternative explanations. *Psychol J Hum Behav* 1977;14:49–51.
22. Shore ER, Rivers C, Berman JJ. Resistance by college students to peer pressure to drink. *J Stud Alcohol* 1983;44:352–61. [PubMed: 6645519]
23. Sherry P, Stolberg V. Factors affecting alcohol use by college students. *J Coll Stud Pers* 1987;28:350–5.
24. Mooney DK, Corcoran KJ. Personal and perceived peer alcohol expectancies: their influences on alcohol consumption. *Psychol Addict Behav* 1991;5:85–92.
25. Tryon GS. Comparison of alcohol use by college students 1983 and 1988. *J Alcohol Drug Educ* 1992;37:111–20.
26. Martin CM, Hoffman MA. Alcohol expectancies, living environment, peer influence, and gender: a model of college-student drinking. *J Coll Stud Devel* 1993;34:206–11.
27. Werner MJ, Walker LS, Greene JW. Concurrent and prospective screening for problem drinking among college students. *J Adolesc Health* 1996;18:276–85. [PubMed: 8860792]
28. Orford J, Krishnan M, Balaam M, Everitt M, Van der Graaf K. University student drinking: the role of motivational and social factors. *Drugs Educ Prev Policy* 2004;11:407–21.
29. Maisto, SA.; Carey, KB.; Bradizza, CM. Social learning theory.. In: Leonard, KE.; Blane, HT., editors. *Psychological theories of drinking and alcoholism*. Vol. 2nd edn.. Guilford Press; New York: 1999. p. 106-63.
30. Abrams, DB.; Niaura, RS. Social learning theory.. In: Leonard, KE.; Blane, HT., editors. *Psychological theories of drinking and alcoholism*. Guilford Press; New York: 1987. p. 131-78.
31. Borsari B, Carey KB. Peer influences in college drinking: a review of the research. *J Subst Abuse* 2001;13:391–24. [PubMed: 11775073]

32. Borsari B, Carey KB. Descriptive and injunctive norms in college drinking: a meta-analytic integration. *J Stud Alcohol* 2003;64:331–41. [PubMed: 12817821]
33. Perkins, HW. *The social norms approach to preventing school and college age substance abuse*. Jossey Bass; San Francisco, CA: 2003.
34. Kypri K, Langley JD. Perceived social norms and their relation to university student drinking. *J Stud Alcohol* 2003;64:829–34. [PubMed: 14743946]
35. Borsari BE, Carey KB. Understanding fraternity drinking: five recurring themes in the literature, 1980–1998. *J Am Coll Health* 1999;48:30–7. [PubMed: 10485163]
36. Christiansen M, Vik PW, Jarchow A. College student heavy drinking in social contexts versus alone. *Addict Behav* 2002;27:393–404. [PubMed: 12118627]
37. Oei TP, Burrow T. Alcohol expectancy and drinking refusal self-efficacy: a test of specificity theory. *Addict Behav* 2000;25:499–507. [PubMed: 10972442]
38. Burke RS, Stephens RS. Social anxiety and drinking in college students: a social cognitive theory analysis. *Clin Psychol Rev* 1999;19:513–30. [PubMed: 10467489]
39. Jones BT, Corbin W, Fromme K. A review of expectancy theory and alcohol consumption. *Addiction* 2001;96:57–72. [PubMed: 11177520]
40. Sher KJ, Wood MD, Wood PK, Raskin G. Alcohol outcome expectancies and alcohol use: a latent variable cross-lagged panel study. *J Abnorm Psychol* 1996;105:561–74. [PubMed: 8952189]
41. Stacy AW, Widaman KE, Marlatt GA. Expectancy models of alcohol use. *J Pers Soc Psychol* 1990;58:918–28. [PubMed: 2348377]
42. Bandura, A. *Social foundations of thought and action: a social cognitive theory*. Prentice Hall; Englewood Cliffs, NJ: 1986.
43. Leonard, KE.; Blane, HT. *Psychological theories of drinking and alcoholism*. Guilford Press; New York: 1987.
44. Dillman DA. The design and administration of mailed surveys. *Ann Rev Sociol* 1991;17:225–49.
45. Nezlek JB. The stability of social interaction. *J Pers Soc Psychol* 1993;65:930–41.
46. Cohen S, Sherrod DR, Clark M. Social skills and the stress-protective role of social support. *J Pers Soc Psychol* 1986;50:63–73.
47. Hays RB, Oxley D. Social network development and functioning during a life transition. *J Pers Soc Psychol* 1986;50:305–13. [PubMed: 3701579]
48. Nezlek JB, Pilkington CJ, Bilbro KG. Moderation in excess: binge drinking and social facilitation among college students. *J Stud Alcohol* 1994;55:342–351. [PubMed: 8022183]
49. Hays RB. A longitudinal study of friendship development. *J Pers Soc Psychol* 1985;48:909–24. [PubMed: 3989674]
50. Wheeler L, Reis H, Nezlek J. Loneliness, social interaction, and sex roles. *J Pers Soc Psychol* 1983;45:943–53. [PubMed: 6631669]
51. Ponzetti JJ, Cate RM. The relationship of personal attributes and friendship variables in predicting loneliness. *J Coll Stud Devel* 1988;29:292–8.
52. Sarason BR, Shearin EN, Pierce GR, Sarason IG. Interrelations of social support measures: theoretical and practical implications. *J Pers Soc Psychol* 1987;52:813–32.
53. Ford GG, Procidano ME. The relationship of self-actualization to social support, life stress and adjustment. *Soc Behav Person* 1990;18:41–51.
54. Procidano ME, Heller K. Measures of perceived social support from friends and from family: three validation studies. *Am J Community Psychol* 1983;11:1–24. [PubMed: 6837532]
55. Brissette I, Scheier MF, Carver CS. The role of optimism in social network development, coping, and psychological adjustment during a life transition. *J Pers Soc Psychol* 2002;82:102–11. [PubMed: 11811628]
56. Demakis GJ, McAdams DP. Personality, social support and well-being among first year college students. *Coll Stud J* 1994;28:235–43.
57. Sandler IN, Barrera M. Toward a multilevel approach to assessing the effects of social support. *Am J Commun Psychol* 1984;12:37–52.

58. Finch JF, Barrera M, Okun MA, Bryant WH, Pool GJ, Snow-Turek AL. The factor structure of received social support: dimensionality and the prediction of depression and life satisfaction. *J Soc Clin Psychol* 1997;16:323–42.
59. Vaux A. Social and emotional loneliness: the role of social and personal characteristics. *Pers Soc Psychol Bull* 1988;14:722–34.
60. Lepore SJ. Social conflict, social support, and psychological distress: evidence of cross-domain buffering effects. *J Pers Soc Psychol* 1992;63:857–67. [PubMed: 1447698]
61. Fondacaro MR, Heller K. Social support factors and drinking among college student males. *J Youth Adol* 1983;12:285–99.
62. Moos R, Moos B, Kulik J. College student abstainers, moderate drinkers, and heavy drinkers: a comparative analysis. *J Youth Adolesc* 1976;5:349–60.
63. Moos R, Moos B, Kulik J. Behavioral and self-concept antecedents and correlates of college-student drinking patterns. *Int J Addict* 1977;12:603–15.
64. Bradley JR, Carman RS, Petree A. Expectations, alienation, and drinking motives among American college men and women. *J Drug Educ* 1991;21:27–33. [PubMed: 2016662]
65. Karwacki SB, Bradley JR. Coping, drinking motives, goal attainment expectancies and family models in relation to alcohol use among college students. *J Drug Educ* 1996;26:243–55. [PubMed: 8952209]
66. Thombs DL, Beck KH, Mahoney CA. Effects of social context and gender on drinking patterns of young adults. *J Counsel Psychol* 1993;40:115–19.
67. Senchak M, Leonard KE, Greene BW. Alcohol use among college students as a function of their typical social drinking context. *Psychol Addict Behav* 1998;12:62–70.
68. Carey KB. Situational determinants of heavy drinking among college students. *J Counsel Psychol* 1993;40:217–20.
69. Carey KB. Heavy drinking contexts and indices of problem drinking among college students. *J Stud Alcohol* 1995;56:287–92. [PubMed: 7623467]
70. Ford DS, Carr PG. Psychosocial correlates of alcohol consumption among Black college students. *J Alcohol Drug Educ* 1990;36:45–51.
71. Steptoe A, Wardle J, Pollard TM, Canaan L. Stress, social support, and health-related behavior. A study of smoking, alcohol consumption and physical exercise. *J Psychosom Res* 1996;41:171–80. [PubMed: 8887830]
72. Teahan JE. Alcohol expectancies, values and drinking of Irish and U.S. collegians. *Int J Addict* 1987;22:621–38. [PubMed: 3623748]
73. Folkman S, Lazarus RS. If it changes it must be a process: study of emotions and coping during three stages of a college examination. *J Pers Soc Psychol* 1985;48:150–70. [PubMed: 2980281]
74. Zaleski EH, Levy-Thors C, Schiaffino KM. Coping mechanisms, stress, social support and health problems in college students. *Appl Devel Sci* 1998;2:12.
75. Hussong AM, Hicks RE, Levy SA, Curran PS. Specifying the relations between affect and heavy alcohol use among young adults. *J Abnorm Psychol* 2001;110:449–61. [PubMed: 11502088]
76. Parish JG, Parish TS. Support systems functionality, self-concepts, and alcohol use. *Coll Stud J* 1991;25:470–2.
77. Wiggins B, Wiggins JA. Specification of the association between sociability and drinking level among college students. *J Stud Alcohol* 1992;53:137–41. [PubMed: 1560665]
78. Rabow J, Duncan-Schill M. Drinking among college students. *J Alcohol Drug Educ* 1994;40:52–64.
79. Wechsler H, Rohman M. Extensive users of alcohol among college students. *J Stud Alcohol* 1981;42:149–55. [PubMed: 7230813]
80. Collins RL, Parks GA, Marlatt GA. Social determinants of alcohol consumption: the effects of social interaction and model status on the self administration of alcohol. *J Consult Clin Psychol* 1985;53:189–200. [PubMed: 3998247]
81. Quigley BM, Collins L. The modeling of alcohol consumption: a meta-analytic review. *J Stud Alcohol* 1999;60:90–8. [PubMed: 10096313]
82. Miller, DT.; Prentice, DA. The construction of social norms and standards.. In: Higgins, FT.; Kruglanski, AW., editors. *Social psychology: handbook of basic principles*. Guilford Press; New York: 1996. p. 799-829.

83. Nystrom M. Positive and negative consequences of alcohol drinking among young university students in Finland. *Br J Addict* 1992;87:715–22. [PubMed: 1591522]
84. McKee SA, Hinson RE, Wall AM, Spriel P. Alcohol outcome expectancies and coping styles as predictors of alcohol use in young adults. *Addict Behav* 1998;23:17–22. [PubMed: 9468737]
85. Williams A, Clark D. Alcohol consumption in university students: the role of reasons for drinking, coping strategies, expectancies, and personality traits. *Addict Behav* 1998;23:371–8. [PubMed: 9668934]
86. Mooney DK, Fromme K, Kivlahan DR, Marlatt GA. Correlates of alcohol consumption: sex, age and expectancies relate differentially to quantity and frequency. *Addict Behav* 1987;12:235–40. [PubMed: 3661276]
87. Brown SA. Expectancies versus background in the prediction of college drinking patterns. *J Consult Clin Psychol* 1985;53:123–30. [PubMed: 3980817]
88. Kidorf M, Sherman MF, Johnson JG, Bigelow GE. Alcohol expectancies and changes in beer consumption of first year students. *Addict Behav* 1995;20:225–31. [PubMed: 7484316]
89. O'Hare T, Sherrer MV. Drinking problems, alcohol expectancies, and drinking context in college first offenders. *J Alcohol Drug Educ* 1997;43:31–45.
90. Kidorf M, Lang AR. Effects of social anxiety and alcohol expectancies on stress-induced drinking. *Psychol Addict Behav* 1999;13:134–42.
91. Milligan RK, Burke V, Beilin LJ, et al. Health-related behaviors and psycho-social characteristics of 18 year-old Australians. *Soc Sci Med* 1997;45:1549–62. [PubMed: 9351145]
92. Baldwin AR, Oei TPS, Young R. To drink or not to drink: The differential role of alcohol expectancies and drinking refusal self-efficacy in quantity and frequency of alcohol consumption. *Cogn Ther Res* 1993;17:511–30.
93. Reis J, Riley WL. Predictors of college students' alcohol consumption: implications for student education. *J Genet Psychol* 2000;16:282–91. [PubMed: 10971907]
94. Ricciardelli LA, Connor JP, Williams RJ, Young RM. Gender stereotypes and drinking cognitions as indicators of moderate and high risk drinking among young women and men. *Drug Alcohol Depend* 2001;61:129–36. [PubMed: 11137277]
95. Weitzman ER, Nelson TF, Wechsler H. Taking up binge drinking in college: the influences of person, social group and environment. *J Adolesc Health* 2003;32:26–35. [PubMed: 12507798]
96. Berkowitz AD, Perkins HW. Recent research on gender differences in collegiate alcohol use. *J Am Coll Health* 1987;86:123–9. [PubMed: 3312362]
97. Connor JP, Williams RJ, Ricciardelli LA. Gender differences in drinking restraint. *J Stud Alcohol* 1999;60:643–6. [PubMed: 10487733]
98. Li TK, Beard JD, Orr WE, Kwo PY, Ramchandani VA. Gender and ethnic differences in alcohol metabolism. *Alcohol Clin Exp Res* 1998;22:771–2.
99. Barbee AP, Gulley MR, Cunningham MR. Support seeking in personal relationships. *J Soc Pers Relat* 1990;7:531–40.
100. Grabill CM, Kerns KA. Attachment style and intimacy in friendship. *Pers Relat* 2000;7:363–78.
101. Franken RE, Gibson KJ, Mohan P. Sensation seeking and disclosure to close and casual friends. *Pers Individ Diff* 1990;11:829–32.
102. Barth RJ, Kinder BN. A theoretical analysis of sex differences in same-sex friendships. *Sex Roles* 1988;19:349–63.
103. Felmlee DH. Social norms in same- and cross-gender friendships. *Soc Psychol Q* 1999;62:53–67.
104. Monsour M. Meanings of intimacy in cross- and same-sex relationships. *J Soc Pers Relat* 1992;9:277–95.
105. Orosan PG, Schilling KM. Gender differences in college students' definitions and perceptions of intimacy. *Women Ther* 1992;12:201–12.
106. Helgeson VS, Shaver P, Dyer M. Prototypes of intimacy and distance in same-sex and opposite-sex relationships. *J Soc Pers Relat* 1987;4:195–233.
107. Mendelson MJ, Kay AC. Positive feelings in friendship: does imbalance in the relationship matter? *J Soc Pers Relat* 2003;20:101–16.

108. Williams DG. Gender, masculinity-femininity, and emotional intimacy in same-sex friends. *Sex Roles* 1985;12:587–600.
109. Bank BJ, Hansford SL. Gender and friendship: why are men's best same-sex friendships less intimate and supportive? *Pers Relat* 2000;7:63–78.
110. Hays RB. The day-to-day functioning of close versus casual friendships. *J Soc Pers Relat* 1989;6:21–37.
111. Southwick L, Steele C, Marlatt A, Lindell M. Alcohol-related expectancies: defined by phase of intoxication and drinking experience. *J Consult Clin Psychol* 1981;49:713–21. [PubMed: 7287981]
112. Ichiyama MA, Kruse MI. The social contexts of binge drinking among private university freshmen. *J Alcohol Drug Educ* 1998;44:18–33.
113. Schall M, Weede TJ, Maltzman I. Predictors of alcohol consumption by university students. *J Alcohol Drug Educ* 1991;37:72–80.
114. Schall M, Kemeny A, Maltzman I. Factors associated with alcohol use in university students. *J Stud Alcohol* 1992;53:122–36. [PubMed: 1560664]
115. Ratliff KG, Burkhart BR. Sex differences in motivations for and effects of drinking among college students. *J Stud Alcohol* 1984;45:26–32. [PubMed: 6700220]
116. Murphy JG, McDevitt-Murphy ME, Barnett NP. Drink and be merry? Gender, life satisfaction, and alcohol consumption among college students. *Psychol Addict Behav* 2005;19:184–91. [PubMed: 16011389]
117. Hartzler B, Fromme K. Heavy episodic drinking and college entrance. *J Drug Educ* 2003;33:259–74. [PubMed: 15022860]
118. Dowdall GW, Crawford M, Wechsler H. Binge drinking among American college women. *Psych Women Q* 1998;22:705–15.
119. Dorsey PM, Scherer CW, Real K. The college tradition of 'drink 'til you drop': the relation between students' social networks and engaging in risk behaviors. *Health Commun* 1999;11:313–34.
120. Wall AM, Hinson RE, McKee SA. Alcohol outcome expectancies, attitudes towards drinking and the theory of planned behavior. *J Stud Alcohol* 1998;59:409–19. [PubMed: 9647423]
121. Slutske WS, Hunt-Carter EE, Nabors-Oberg RE, et al. Do college students drink more than their non-college-attending peers? Evidence from a population-based longitudinal female twin study. *J Abnorm Psychol* 2004;113:530–40. [PubMed: 15535786]
122. Oetting ER, Beauvais F. Peer cluster theory: drugs and the adolescent. *J Counsel Devel* 1986;65:17–22.
123. Ajzen, I. From decisions to actions: a theory of planned behavior.. In: Kuhl, J.; Beckman, J., editors. *Action-control: from cognition to behavior*. Springer; New York: 1985. p. 11-39.
124. Ajzen, I.; Fishbein, M. *Understanding attitudes and predicting social behavior*. Prentice Hall; Englewood Cliffs, NJ: 1980.
125. Donovan JE, Jessor R, Costa FM. Adolescent problem drinking: stability of psychosocial and behavioral correlates across a generation. *J Stud Alcohol* 1999;60:352–61. [PubMed: 10371263]
126. Jessor, R.; Donovan, JE.; Costa, FM. *Beyond adolescence: problem behavior and young adult development*. Cambridge University Press; Cambridge, UK: 1996.
127. Babor TF, Stephens RS, Marlatt GA. Verbal report methods in clinical research on alcoholism: response bias and its minimization. *J Stud Alcohol* 1987;48:410–24. [PubMed: 3312821]
128. Nezlek JB. Using multilevel random coefficient modeling to analyze social interaction diary data. *J Soc Pers Relat* 2003;20:437–69.
129. La Forge RG, Borsari B, Baer JS. The utility of collateral informant assessment in college alcohol research: results from a longitudinal prevention trial. *J Stud Alcohol* 2005;66:479–87. [PubMed: 16240555]
130. Hussong AM. Social influences in motivated drinking among college students. *Psychol Addict Behav* 2003;17:142–50. [PubMed: 12814278]
131. O'Leary Tevyaw TA, Borsari B, Colby SM, Monti PM. Inclusion of peers in a brief motivational intervention with mandated college students. *Psychol Addict Behav*. in press
132. Singer, JD.; Willett, JB. *Applied longitudinal data analysis*. Oxford University Press; New York: 2003.

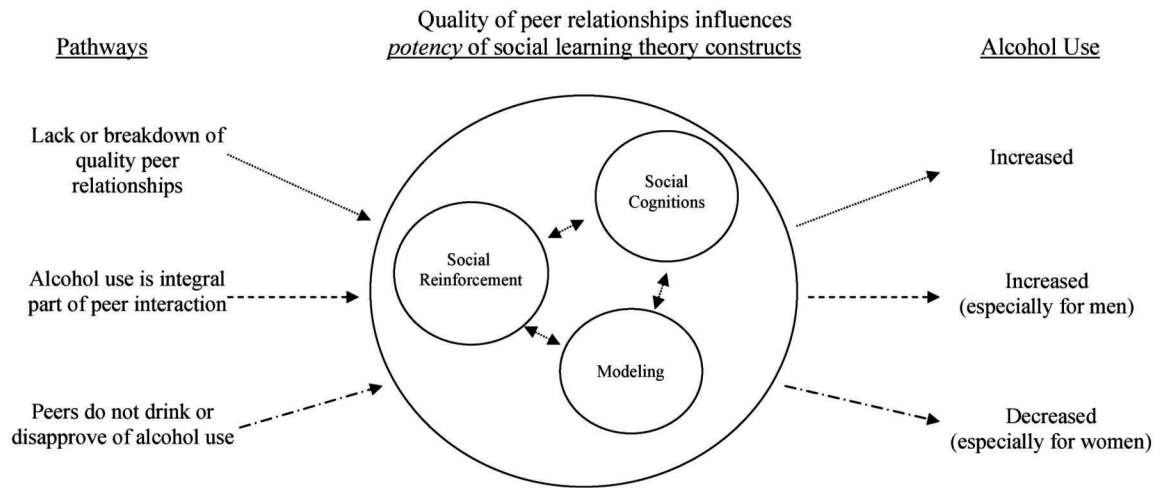


Figure 1.
Influence of quality of peer relationships on personal alcohol use.