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Social identity and drinking: Dissecting social networks and implications for novel interventions

Clayton Neighbors^a, Heather Krieger^a, Lindsey M. Rodriguez^b, Dipali V. Rinker^a, Jordanna M. Lembo^a

^aDepartment of Psychology, University of Houston, Houston, Texas, USA

^bDepartment of Psychology, University of South Florida, St. Petersburg, USA

Abstract

Drinking among young adults has been consistently associated with perceptions of prevalence and approval of varying levels of drinking among broadly defined similar others (e.g., other female college students). Less work has considered influences in terms of actual group members comprising individuals' social networks. We proposed two overlapping groups would differentially influence drinking and related consequences (important others; drinking buddies; and members of both groups). Furthermore, we expected that specific individuals (e.g., romantic partners and family members) would be associated with less drinking. Data were provided from 372 drinkers who logged daily drinking and presence of network members on MTURK. Results indicated consistent support for the number of network members present as a predictor of the number of drinks consumed per drinking day, regardless of member characteristics. Only important others who were not drinkers and romantic partners failed to demonstrate unique positive associations with drinks per drinking day.

Factors that significantly impact drinking behaviors are the drinking behaviors and attitudes of others. Drinking among young adults has been consistently associated with perceptions of the prevalence and approval of varying levels of drinking among broadly defined similar others (e.g., other female college students). However, less work has considered influences in terms of actual group members comprising individuals' social networks. The current study examined the likelihood of drinking and number of drinks consumed on drinking days as a function of the number of network members with whom participants interacted with on a given day; interactions with important others, drinking buddies or both; and the nature of the relationship with network members whom the participants interacted with on a given day. Additionally, the likelihood of drinking was assessed as a function of who participants interacted with on a given day.

Peer Influence

Peer influence is a strong predictor of alcohol use and abuse among young adults – although much of the empirical support has come from college samples (Wood, Read, Palfai, &

Stevenson, 2001). One conceptualization of peer influence, perceptions of peers' alcohol use (i.e., perceived norms), has received much attention in the college drinking literature (e.g., Borsari & Carey, 2001, 2003; Lewis & Neighbors, 2004; Perkins, 2002). This body of research has found that greater perceptions of alcohol use by peers is predictive of personal alcohol use and alcohol-related problems (e.g., Larimer, Turner, Mallett, & Geisner, 2004; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). However, it is unclear who individuals use to create their estimations and if there are specific individuals who are more influential. Perhaps rather than the overall social network or number of heavy drinkers in the network influencing drinking patterns, specific social network members have particularly strong influences over an individual's drinking.

Research shows that those with whom individuals drink strongly influence their drinking patterns. There are compelling associations between a person's peer network and their own alcohol use (Fondacaro & Heller, 1983), binge drinking (Delucchi, Matzger, & Weisner, 2008), and alcohol-related problems (Lau-Barraco & Collins, 2011). People drink more when they do so with friends (Borsari & Carey, 2006; Connor, Cousins, Samaranayaka, & Kypri, 2014). Drinking buddies—or friendships wherein the primary activity is drinking—have been identified as a risk factor associated with increased alcohol use and misuse (Reifman, Watson, & McCourt, 2006). Heavy drinkers are more likely to have drinking buddies compared with regular drinkers (e.g., 73% vs. 32% in one sample; Leonard et al., 2000). The specific types of friends also matter. For example, drinking with Fraternity and Sorority members resulted in an increase in alcohol consumption among 21st birthday celebrants (Rodriguez et al., 2016). Most studies have examined peer friendship networks, but other types of close others matter (family members, romantic partners).

Not all drinking comrades are related to greater frequency or quantity of drinking. For example, drinking with family (Keough et al., 2015) and romantic partners (Rodriguez et al., 2016) tend to be protective, resulting in lower levels of drinking. Rodriguez et al. (2016) compared how drinking alone and drinking with Fraternity/Sorority members, friends, casual acquaintances, family members and romantic partners influenced a heavy drinking event. Celebrating their 21st birthday with Fraternity/Sorority members, friends, acquaintances, and roommates was linked with greater drinking and estimated peak blood alcohol content (eBAC), whereas celebrating with romantic partners was linked with fewer drinks and a lower eBAC. It has yet to be seen how drinking companions influence typical drinking.

Previous work has traditionally conceptualized drinking companions as relatively nebulous, operationalized by asking individuals how frequently they usually drink with certain groups. The only other research comparing various companions (Rodriguez et al., 2016) did so under the context of a high-risk event, 21st birthday drinking. This research is advantageous as it offers insight into how specific individuals in specific roles are linked with drinking behavior in a recent timeframe (i.e., previous 14 days; 5 most recent drinking occasions).

Current Research

This research identifies individuals within a person's social network that are associated with drinking behaviors. We assess whether the presence of drinkers increases the quantity of alcohol consumed and the likelihood of drinking on a given day and if any individuals provide some protective benefits for risky drinking. We propose two overlapping groups would differentially influence drinking and related consequences (important others; drinking buddies). Furthermore, we expect that specific individuals are likely to be associated with greater likelihood of heavier drinking and related consequences when present, whereas others will be associated with lower risk, either directly and/or by buffering the influence of risky others.

Specifically, we expect: 1) The number of network members present on drinking days will be positively associated with the number of drinks consumed; 2) The more important people who drink that are present will be positively associated with quantity of alcohol consumed on that occasion – this will also be true of drinking buddies and those effects will be independent; 3) The presence of romantic partners will be protective (leading to lower quantities); 4) The presence of friends will be positively associated with quantity consumed. 5) In addition, we also examined associations between socialization with network members on a given day and likelihood of drinking on that day. We expected that socialization with important people who were not drinkers would be associated with lower likelihood of drinking on that day. Moreover, socialization with important people who were drinkers and drinking buddies would increase likelihood of drinking.

Method

Participants and Procedures

A total of 372 participants consented to participate and completed a one-time survey. Participants included 132 men (35.46%). Mean age of the sample was 25.08 ($SD = 2.96$). The sample identified as 76.61% Caucasian, 9.41% Black/African American, 6.18% Asian/Pacific Islander, and 7.8% Other/Multiracial. Additionally, 11.29% reported being Hispanic/Latino(a). The majority of participants had a bachelor's degree (42.20%) or some college (37.37%), 10.48% a High School Diploma or less, and 9.14% a Graduate Degree. Participants were recruited using Amazon's Mechanical Turk System (MTurk, www.mturk.com). Mturk users read a brief study description explaining the topic of the study, 15-minute expected duration, and \$2.00 compensation. Inclusion criteria for the sample were consuming alcohol once a week or more, current age between 18 and 29, having participated in less than 100 MTurk activities, 95% approval rating or higher for previously completed Mturk activities, and residence in the United States.

Measures

Participants were asked to report on 10 individuals in their social networks, their drinking behaviors over the previous two weeks, their interactions with the listed individuals over the previous two weeks, and demographic characteristics. Demographic characteristics included gender, education status, race, ethnicity, and relationship status.

Social Network Assessment.—Individuals were asked to list five people “whom you are closest to that you interact with face to face at least once a week.” They were then asked to indicate what their relationship to the listed person was (e.g. close friend, romantic partner, family, etc.) and if they consume alcohol with them. These individuals are henceforth referred to as close others or important people, important drinkers (if they consumed alcohol with them), or important non-drinkers (if they did not drink with them). Participants were then asked to list five people they were “most likely to consume alcohol with who you did not list above,” and their relationship to the listed person. These individuals are henceforth referred to as drinking buddies.

Alcohol Measure.—To assess alcohol consumption participants were presented with a time-line-follow-back (TLFB) for the previous two weeks. For each day, they were asked to report how many drinks they consumed and over how many hours they drank. Following the drinking TLFB participants were presented with a second TLFB asking them to report which of the 10 people they listed were present when they were drinking, if other people not listed were present, or if they were drinking alone. Typical drinking was also assessed and included as a covariate using the Daily Drinking Questionnaire (Collins, Parks, Marlatt, 1985), which asks participants to estimate the average number of drinks they consume on each day of the week over the past three months.

Analysis Plan

The central goal of this research was to examine the number of drinks consumed on each drinking day as a function of the presence of participants’ personal networks. Each participant contributed up to 14 data points, with the average number corresponding to the number of days during which alcohol was consumed. The outcome, drinks per drinking day, was a truncated negative binomially distributed count variable consisting of only positive integers with the lowest possible value being 1 (had to drink at least one drink). Three truncated negative binomial models were conducted using Stata 14 (one for testing hypothesis 1, one for testing hypothesis 2, and one for testing hypotheses 3 and 4). Each model predicted the number of drinks per drinking day with standard errors adjusted for within person clustering. Logistic regression was used to test hypothesis 5, which focused on whether participants drank or not on each day as a function of whom they interacted with. Standard errors were again adjusted for clustering.

Results

Descriptive Statistics

The average number of drinks consumed weekly in the past three months based on the Daily Drinking Questionnaire was 8.58 ($SD = 8.66$). Descriptive statistics from the past 2 week TLFB indicated that participants reported drinking on 45% of the 14 days and drank on average three drinks per drinking occasion. Almost all participants listed five important network members (97.04%, $n = 361$) and five network members with whom they were most likely to drink (i.e., drinking buddies; 93.82%, $n = 349$). On average, when participants consumed alcohol they did so with one or two of the network members whom participants listed. Of the network members that were present, on average, one was an important person

who drinks, none were important non-drinkers, and one was a drinking buddy. Detailed descriptive statistics are displayed in Table 1.

Primary Analyses

Hypothesis 1 was that the number of network members present on drinking days would be positively associated with number of drinks consumed. As expected the number of network members present on drinking days was positively associated with quantity of alcohol consumed. Specifically, the presence of each additional network member was associated with a 14% increase in number of drinks consumed on that occasion. This effect was independent of the participant's average weekly drinking behaviors. Table 2 displays the results of the regression analysis.

The second hypothesis was that the number of important drinking people present and the number of drinking buddies present would be uniquely positively associated with quantity of alcohol consumed. Results support the hypothesis that the presence of an important drinker is positively associated with quantity of alcohol consumed. Specifically, for every important person, who is a drinker and is present, the number of drinks per drinking day increases by 21% ($b = 0.19$, $\exp(b) = 1.21$, $s.e. = 0.031$, $z = 6.04$, $p < .001$). Similarly, the presence of drinking buddies was associated with a 17% increase in drinking quantity ($b = 0.16$, $\exp(b) = 1.17$, $s.e. = 0.023$, $z = 6.60$, $p < .001$; see Figure 1). These effects were independent of weekly drinking behaviors. Results of the combined model (shown in Table 3) indicate that the presence of important drinkers and drinking buddies are associated with 15% and 13% increase in drinking, respectively. Important people who do not drink are not protective relative to the presence of important drinkers and drinking buddies.

Hypotheses 3 and 4 tested the impact of the relationship between the participant and network members on drinking. Specifically, we expected the presence of romantic partners to be negatively associated with drinks consumed and number of friends to be positively associated with number of drinks consumed. Hypothesis 3 was not supported given that the presence of a romantic partner was not associated with number of drinks consumed. Hypothesis 4 was supported in that the number of friends and close friends present on a drinking occasion were positively associated with increased drinking. Each additional friend and close friend was associated with a 13% and 17% increase in quantity of alcohol consumed, respectively. The presence of family members was also related to increases in drinking (11%). Contrary to our expectations, the presence of a romantic partner was not associated with number of drinks consumed. Table 4 displays the results of this regression analysis.

Finally, hypothesis 5 focused on likelihood of drinking on a given day as a function of socialization with network members. This was examined in two separate logistic regression analyses. In the first analyses, whether participants consumed any alcohol on a given day was examined as a function of the number of network members with whom participants interacted on that day. In the first analysis, network members were classified as the number of important non-drinkers, important drinkers, and drinking buddies. In the second analysis the likelihood of drinking on a given day was examined as a function of the proportion of network members with whom participants interacted. In this analysis, network members

were classified as the proportion of important non-drinkers relative to the total number of close others listed, the proportion of important drinkers relative to the total number of close others listed, and the proportion of drinking buddies relative to the total number of drinking buddies listed. As predicted, socialization with important non-drinkers was associated with a lower likelihood of drinking whereas socialization with important drinkers and drinking buddies was associated with greater likelihood of drinking on a given day. Results are presented in table 5. Both analyses provided comparable results indicating that interacting with close others with whom one does not drink with was associated with a lower likelihood of drinking on that day. In contrast, interacting with close others with whom participants drank with and drinking buddies were both uniquely associated with a greater likelihood of consuming any alcohol that day.

Discussion

The purpose of this study was to examine the association between having specific types of individuals within a person's network who also drank (e.g. self-identified important person, drinking buddy, and/or members of both groups) and problem drinking on a given occasion. Additionally, we sought to examine whether any of these individuals who were non-drinkers provided any protection against risky drinking.

Our results indicated that the greater the number of network members who drank, the greater the number of drinks consumed on drinking days. Additionally, each important drinker, drinking buddy, close friend, and friend who was present on a given drinking occasion was incrementally associated with an increase in alcohol consumption. Contrary to expectation, the presence of important non-drinkers or romantic partners was not associated with the amount of alcohol consumed on drinking occasions. The presence of family members was unexpectedly associated with consuming more alcohol on drinking occasions. Further examination of whether any drinking occurred revealed that interacting with close others who were non-drinkers was associated with a lower likelihood of consuming alcohol on a given day whereas interacting with close others who were drinkers and drinking buddies on a given day was associated with a greater likelihood of drinking on that day.

The findings from this study provide at least partial support for going beyond simply understanding the influence of broadly defined social groups on drinking, to understand the impact of the significant influence of specific individuals within a social network. Individuals who drink, and whom the participant is both closest to and interacts with regularly, are significantly likely to influence the individual's personal drinking behaviors. Moreover, consistent with the literature on the impact of drinking buddies (Homish & Leonard, 2008; Lau-Barraco, Braitman, Leonard, & Padilla, 2012; Lau-Barraco & Collins, 2011; Lau-Barraco & Linden, 2014; Leonard, Kearns, & Mudar, 2000; Reifman, Watson, & McCourt, 2006), the presence of such individuals within a network is highly associated with drinking behaviors.

The findings from this study are consistent with the Social Identity Theory (SIT; Tajfel & Turner, 1979, 1986), upon which peer norms-based interventions are predicated. SIT suggests that much of how we identify is based on groups with which we affiliate. Our

attitudes, beliefs, and behaviors are thus influenced by groups that are important to us, and we in turn see ourselves and other group members as having a common identity (Abrams & Hogg, 1999; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Social identity has been measured in many different ways with regard to alcohol use, specifically as it relates to perceived norms. Work by Reed and colleagues (Reed, Lange, Ketchie, & Clapp, 2007) found support for social identity as a moderator of normative influences on drinking across three referent groups of college students. The authors measured social identity with four items assessing the degree to which they identified with the referent group, how similar they felt they were to the group, how strong a bond they had with those group members, and how much being a part of the group was a part of their own self-identity. Again, results suggested that the stronger the identification with the referent group, the stronger the association between norms and drinking. Neighbors et al. (2010) also found support for self-identification as a moderator of the association between perceived descriptive norms and drinking. In this study, identification was assessed simply as an overlap between one's own identity and that of the group using a series of overlapping circles modified from the Inclusion of In-group in the Self measure (Tropp & Wright, 2001). Similarly, the more one identified with the group, the stronger the association between norms and drinking.

Contrary to previous research (Leonard & Homish, 2008; Leonard, Kearns, & Mudar, 2000; Leonard & Mudar, 2000; Leonard & Mudar, 2003; Leonard & Mudar, 2004), neither non-drinking important people nor romantic partners were protective of risky drinking on drinking days. However, consistent with previous literature, on days when participants interacted with close others who were non-drinkers they were less likely to engage in any drinking. Furthermore, it is possible that romantic partners, family members, and other important others may have been protective against consequences related to drinking days (e.g. experiencing hangovers or blackouts, getting into fights, etc.) but not number of drinks consumed on drinking days.

Implications for Intervention and Prevention

Interventions utilizing social network approaches have much to offer in our understanding of how specific individuals' behavior affects and is affected by other people. While social norms approaches have emphasized how others' drinking compares to one's own drinking, the "others" are usually not identifiable specific individuals, but rather hypothetical others who are presumably similar. The findings from this research suggest that the individuals who have the greatest influence on us are those whom we know, care about, spend time with, etc. They are the people with whom we have some degree of relationship. Perceived norms regarding friends, romantic partners, and family members are likely to have much greater influence on behavior relative to any abstract estimate of a hypothetical group. Studies of natural drinking groups have identified consistent roles individuals tend to fill within drinking groups, such as organizer/planner; initiator of drinking activities (e.g., drinking games); social regulator/leader; and person who watches out for others (e.g., caregiver/designated driver; Lange, Devos-Comby, Moore, Daniel, & Homer, 2011). Surveys of natural drinking groups before and after visiting drinking establishments have shown that higher status members drink the most in heavy drinking groups, and encourage the most consumption by other members.

In addition to smaller personal networks, sociocentric networks have considerable potential to provide novel intervention approaches. Providing a targeted intervention to important individuals and/or close friends within a network that could then be diffused to other network members may prove to be a potential opportunity for social network interventions. Specifically, providing interventions targeting important drinkers within a network to increase the use of protective behavioral strategies and/or intervene on others within the network who are drinking problematically may also be an opportunity to further explore. Targeted network interventions may be particularly useful in a social network that has a large number of “extreme” binge drinkers or networks that are resistant to more general social norms interventions.

Limitations

MTurk has recently increased in popularity within social science research, yet it is not without flaws. Research has praised MTurk for its ability to provide more demographically varied samples than more traditional recruitment methods, and other internet samples (Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011). Additionally, research has found that MTurk participants provided results consistent with those collected within a laboratory setting (Eriksson & Simpson, 2010; Gardner, Brown, & Boice, 2012; Horton, Rand, & Zeckhauser, 2011). Some researchers have expressed concern over the attentiveness of MTurk participants and the quality of collected data (Chandler, Mueller, & Paolacci, 2014; Oppenheimer, Meyvis, & Davidenko, 2009). Research has produced mixed support for these concerns. Self-reports have shown that MTurkers frequently engage in distractions (e.g., using cell phones; Clifford & Jerit, 2014), and multi-tasking while participating in a survey (Chandler et al., 2014). Yet other research has indicated that MTurkers were more attentive to instructions, and had a greater response to a manipulation, than college student participants and well-paid community samples (Goodman, Cryder, & Cheema, 2013; Hauser & Schwarz, 2016).

Beyond limitations associated with MTurk, participants may have been inaccurate in recalling their drinking on each day over the past two weeks or in recalling the specific number of drinks on drinking occasions, especially if they consumed a high number of drinks. Additional research could be designed to better account for variance in drinking patterns with specific network members. For example, an individual might only interact with some network members in drinking-related contexts. Others, such as family members, could be further categorized as parents, siblings, or children. Incorporation of other potential explanatory or confounding variables such as personal drinking history, age, student and work status, day of the week, and other factors would facilitate more fine-grained conclusions. Finally, although the present sample was not a college sample, much of the supporting literature underlying the proposed research was drawn from college samples. Thus, these findings expand current research in student populations, but suggest that further work is needed on social networks in older adult populations, as patterns of drinking are to some extent different from younger adults.

Conclusion

Findings from the present study generally support a consistent association between the number of personal network members present on drinking days and amount consumed on drinking days. Over and above participants' typical drinking network the number of important others and drinking buddies were uniquely associated with more drinks per drinking day. In addition, the number of family members, friends, and close friends present were each uniquely and positively associated with drinks per drinking day. The only two categories of network members that were not associated with drinking were important others who were non-drinkers and romantic partners. Nevertheless, neither of these were associated with less drinking. Future research examining network membership and drinking consequences would help determine whether specific types of members may protect against problems even if they do not directly impact number of drinks. It might also be helpful to assess level of closeness with network members more continuously. Finally, future research examining specific constellations of network members present on heavy drinking occasions within individual networks may provide useful feedback in helping prevent negative consequences.

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Figure 1.
Drinks per Drinking Day as a Function of Number of Important People and Drinking Buddies Present

Table 1.

Descriptive Statistics for Drinking Occasions

Variable	Mean	SD	Min	Max
Number of Drinks	3.08	2.62	1.00	18.00
Network Members Present	1.55	1.81	0.00	10.00
Important Drinkers Present	0.89	0.99	0.00	5.00
Important Non-Drinkers Present	0.02	0.14	0.00	1.00
Drinking Buddies Present	0.64	1.22	0.00	5.00
Romantic Partner Present	0.37	0.48	0.00	2.00
Family Member(s) Present	0.27	0.69	0.00	6.00
Friend(s) Present	0.46	1.11	0.00	10.00
Close Friend(s) Present	0.37	0.83	0.00	7.00

Note. n = 2,162 observations

Table 2.

Drinks Per Drinking Day as a Function of Average Weekly Drinking and Number of Network Members Present

Variable	b	s.e.	Z	exp(b)	LCI	HCI
Average Weekly Drinking	0.038	0.007	5.95***	1.039	1.026	1.052
Number of Network Members	0.127	0.019	7.56***	1.136	1.099	1.174

Table 3.

Drinks Per Drinking Day as a Function of Average Weekly Drinking, Important Network Members and Drinking Buddies

Variable	b	s.e.	Z	exp(b)	LCI	HCI
Average Weekly Drinking	0.038	0.007	5.93***	1.039	1.026	1.052
Important Drinker(s)	0.139	0.036	4.41***	1.150	1.081	1.223
Important Non-Drinker(s)	0.216	0.193	1.39	1.241	0.915	1.684
Drinking Buddy(s)	0.115	0.027	4.79***	1.122	1.071	1.176

Table 4.

Drinks Per Drinking Day as a Function of Average Weekly Drinking, and Network Members Relationship with Participant

Variable	b	s.e.	Z	exp(b)	LCI	HCI
Average Weekly Drinking	0.037	0.007	5.83***	1.038	1.025	1.051
Romantic Partner	0.103	0.088	1.30	1.109	0.949	1.296
Family Member(s)	0.111	0.041	3.05**	1.118	1.041	1.200
Friend(s)	0.128	0.027	5.35***	1.137	1.085	1.192
Close Friend(s)	0.170	0.036	5.68***	1.186	1.118	1.257

Table 5.

Any Drinking as a Function of Number and Proportion of Network Members Present

Variable	OR	SE	Z	LCI	HCI
Number of important non-drinkers interacted with	0.88	0.04	-2.75**	0.80	0.96
Number of important drinkers interacted with	1.17	0.05	3.72***	1.08	1.27
Number of drinking buddies interacted with	1.20	0.04	5.33***	1.12	1.29
Proportion of important drinkers interacted with	0.58	0.14	-2.20*	0.36	0.94
Proportion of important non-drinkers interacted with	2.01	0.41	3.39**	1.34	3.00
Proportion of drinking buddies interacted with	2.55	0.41	5.89***	1.87	3.49