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Willingness and Appropriateness of Peers Participating in Emerging Adults' Substance Misuse Treatment

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Abstract

This study investigates the feasibility of adapting empirically-supported family treatments for emerging adult peer dyads. Data were collected ($n=84$) from emerging adults and their peers. Peers completed measures of substance use, willingness to participate in their friends' treatments, and an adapted version of the Significant Other Behavior Questionnaire (SBQ), which measures concerned significant others' (CSO) responses to another's use such as punishing, supporting, or withdrawing from the user. Peers were more likely to support sobriety or enable use, versus punishing use or withdrawing from their friends. Overall, peers were quite willing to assist in treatment, but heavily using peers were less enthusiastic. For some emerging adults, their current peers may represent untapped resources to integrate into treatment, and providing peer-enhanced treatments may expand the reach of services to non-treatment seeking populations.

Keywords

Emerging Adulthood; Close Friendships; Peers; Substance Abuse; Psychotherapy

1. Introduction

Emerging adults ages 18-25 account for a high percentage of all treatment admissions in publicly funded treatment centers (Substance Abuse and Mental Health Service Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2012), and exhibit poorer outcomes when contrasted with older adults or younger adolescents receiving similar treatments (Satre, Mertens, Areán, & Weisner, C, 2003; Smith, Godley, Godley, & Dennis, 2011). Thus, it is imperative that the treatment

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field looks to improve the outcomes for such a large constituency of treatment recipients. This study investigates the feasibility of adapting empirically-supported family treatments for emerging adult peer dyads.

Providers and clinical researchers rarely integrate peers into emerging adults' treatments (Longabaugh, 2003; O'Leary-Tevyaw, Borsari, Colby, & Monti, 2007; Neighbors et al., in press) despite the recommendations from some authors (Andrews, Tildesley, Hops, & Li, 2002; McCrady, 2004; Goodman, Peterson-Badali, & Henderson, 2011). A strong rationale exists for designing peer-enhanced interventions for emerging adults. Research consistently shows that peers, or non-romantically involved friends with whom one has regular contact, play an important role in the development (Stone, Becker, Huber, & Catalano, 2012), maintenance (Delucchi, Matzger, & Weisner, 2008), and recovery from such disorders (Litt, Kadden, Kabela-Cormier, & Petry, 2009; Mohr, Avena, Kenny, & Del Boca, 2001). Indeed, with older adult samples, the degree of social network member support for drinking may influence the likelihood of seeking particular treatment modalities (e.g., 12 Step Programs) and individual post-treatment outcomes (Beattie & Longabaugh, 1997; Longabaugh, Wirtz, Zweben, & Stout, 1998).

One obstacle to integrating peers into emerging adults' treatments is that peers may also misuse substances, rendering them unsuitable or unwilling to participate as concerned significant others (CSOs). The assumption that emerging adults do not have any non-using peers may, however, not be entirely accurate. For example, one large study found 40% of emerging adults in outpatient treatment (n=1,149) don't associate with regularly substance-using peers at intake to treatment (Dennis, White, & Ives, 2009).

Additionally, the assumption that substance using peers will not participate as supportive CSO's may not be entirely accurate. That is, two studies support the use of peers as CSOs for emerging adults in need of intervention (O'Leary-Tevyaw et al., 2007; Neighbors et al in press). O'Leary-Tevyaw and colleagues (2007) randomized college students to two sessions of individual (IMI) or peer-enhanced motivational interviewing (PMI). Heavy-drinking peer CSOs did not negatively impact clients' outcomes and peers in the PMI condition also reduced their use at follow up. Neighbors and colleagues (in press) studied whether peer-enhanced conditions that provided normative feedback and safety tips to peers were more effective at reducing negative consequences of college students' 21st birthday drinking. Peer enhanced conditions were superior to the inactive control group at reducing negative consequences, but were equivalent to active comparison groups that did not include peers. Peer drinking behavior, was not reported in this study, but peers did receive normative feedback on their drinking, so it is reasonable to assume that this study enlisted both light and heavy drinking peers to provide support to the identified client. Though we should carefully consider peers' characteristics when designing treatments that include them as CSOs, the assumption that substance-using peers are unsuitable CSOs is questionable.

A second obstacle for developing peer-enhanced interventions is determining the theoretical constructs to target in such interventions. Most empirically-supported interventions developed for CSOs are based on behavioral family theories originally derived from studies of families. Thus, although we have measures of how family members may respond to their loved one's substance use (Love, Longabaugh, Clifford, Beattie, & Peaslee, 1993; Orford, Templeton, Velleman, & Copello, 2005), little is known about how findings apply to emerging adults' peers. For example, some behaviors that spouses may do that reinforce their partners' substance use such as calling them in sick from work after drinking, may be irrelevant in the peer context. We have no data to suggest what peers may do, which could inform treatment development efforts. Finally, we also do not know if peers are amenable to being included in interventions that use principles of behavioral family treatments. To our

knowledge, only two college-setting studies using brief motivational interventions have attempted to exclusively integrate peers into substance misuse treatment of emerging adults (O'Leary-Tevyaw et al, 2007; Neighbors et al, in press), and none have attempted to modify family training procedures for such peers.

1.1 Family Behavioral Theory and Interventions

Family members discourage or encourage substance use as they use a variety of strategies to attempt to regulate, and in some cases extinguish the others members' unhealthy behaviors (Holmila, Mustonen, & Rannik, 1990, Rook & Ituarte, 1999; Suonpaa, 2005, Umberson, 1987). Behavioral responses to substance use could include positive strategies that support abstinence, coercive or enabling responses that may unwittingly promote continued use, or passive or deliberate withdrawal of attention from the loved one during periods of heavy use.

As substance misuse triggers behavioral responses in family members (Jacob & Leonard, 1988; LePoire et al., 2000), interventions focus on modifying such responses (Azrin, Sisson, Meyers, & Godley, 1982; O'Farrell and Fals-Stewart, 2006, Orford et al., 2005). For example, Smith and Meyers' (2004) Community Reinforcement Approach and Family Training (CRAFT) teaches CSOs to engage in supportive behaviors that compete with the substance use, and reduce behaviors that enable or inadvertently reinforce on-going use. CRAFT was more effective than Al-Anon or Johnson Intervention techniques (Meyers, Miller, Smith, & Tonigan, 2002; Miller, Meyers, & Tonigan, 1999) at engaging treatment resistant users into treatments. O'Farrell and Fals-Stewart's (2006) family treatment also asks CSOs to support clients' abstinence by increasing shared rewarding activities that support sobriety and limit their loved one's exposure to substance use triggers.

1.1.1 Can emerging adults' peers use behavioral family therapy procedures?—

To inform how to best modify family therapies for use with emerging adults' peers, this study examines trends in peers' responses to the substance use of a friend, or identified client, that has come into contact with the substance use treatment system. This is important, as treatment outcome findings and the principles on which they are based, may not generalize to peer relationships. For example, the lack of shared family finances may make it less likely that peers would be motivated to use coercive strategies to encourage friends to stop using. As peers are likely to use together, we also expect that peers will not withdraw from their friends when they are using.

1.2 Summary and Research Questions

The purpose of the present study is to shed light on the feasibility of including peers in the treatment of emerging adults by asking them about their willingness to do activities included in behavioral family interventions. To our knowledge, this is the first study to explore whether peers of emerging adults use strategies to attempt to regulate their friends' use, and whether they are amenable to participating in an adapted behavioral treatment as a CSO.

We expect to find that (a) peer substance use is associated with behaviors that enable their friends' substance use; (b) peers who have attempted to support their friends' sobriety will have favorable attitudes toward their friends receiving treatment; (c), that peers are unlikely to use coercive or passive withdrawal strategies in response to their friends use; and, (d), that peers will be willing to participate as CSOs in their friends treatment.

2. Method

2.1 Procedure and Participants

IRB approval was obtained before implementing study procedures. Participants were recruited at a not-for-profit outpatient substance use disorder treatment agency. To qualify for this study, participants were: between the ages of 18 to 25 years old, met the threshold for being referred for a substance use disorder assessment per the GAIN Short Screener (Dennis et al, 2006), scored 1 or higher on the Short Michigan Alcohol Screening Test (SMAST, Selzer, Vinokur, & Van Rooijen, 1975), lived within 30 miles of the study location, and could obtain an eligible peer to participate. Based on O'Leary-Tevyaw's et al.'s (2007) peer eligibility criteria, participants (i.e., identified clients) gave the names of three peers who met inclusion criteria, including being: similar in age to the identified client, a non-romantic friend with whom they have weekly contact and, supportive of the identified client seeking treatment. Identified clients gave us their first preference for which peer should participate, and gave study announcement cards to peers after their interviews. If we could not reach their preferred peer, we called other peers they listed. Peers consented to participate. Identified clients and peers received \$40 compensation, and an additional \$10 for timely completion of interviews.

Between April, 2009 and November, 2010, 269 emerging adults were screened for participation. Ninety-six individuals (35.7%) were eligible. The remainder were ineligible for the following reasons, including: not meeting the screening threshold on the AUDIT (53.9%, $n = 145$), not having a peer available to participate in the study (10.03%, $n = 27$), or living out of the study catchment area (0.004%, $n = 1$). Among the 96 individuals meeting eligibility criteria, 43 dyads (44.8%) consented to participate. Reasons for not recruiting eligible participants included lack of interest (17.7%, $n = 17$), failure to contact the individual after they initially expressed interest (15.6%, $n = 15$), and other unknown reasons (21.8%, $n = 21$). One dyad was dropped from analysis for participating twice, leaving a final analysis sample of 42 dyads ($n = 84$).

2.2 Measures

2.2.1 Peer Reactions to Participant's Substance Use—Peers completed the Significant Other Behavior Questionnaire (SBQ), a reliable and valid measure of CSOs responses to the identified client's substance use (Love, Longbaugh, Clifford, Beattie, & Peaslee, 1993; Rychtarik & McGillicuddy, 1997; Walitzer & Dermen, 2004). The SBQ is a Likert-style scale ($1 = \text{highly unlikely to } 5 = \text{highly likely}$) with four subscales including *punish substance use*, *support sobriety*, *support substance use* and *withdrawal (from friend)*. The *punish substance use* subscale (PS, 5 items, range = 5 to 25) measures the frequency of the peer using negative or coercive strategies (i.e., "Do you stop your friend's drinking by getting angry?") to stop the participant's drinking. The *support sobriety* subscale (SS, 8 items, range = 8 to 40) measures the frequency with which the peer uses positive behaviors (e.g., "Do you do things for your friend when they are not drinking or using?") to encourage the participant to not use. The *support substance use* subscale (SSU, 6 items, range 0 to 30) measures the frequency with which the peer has encouraged the participant to drink or use drugs (e.g., "Do you tell your friend to have just have 'two or three?'") The *withdrawal* subscale (WFF, 5 items; range 5 to 25) measures peer efforts to disengage with the participant when he or she is drinking (e.g., "Do you refuse to take care of your friend when they are drunk or high?"). We made minor adaptations to the SBQ. For example, we replaced "significant other" with "friend", revised one item to remove the assumption that peers lived with participants (e.g. "Do you refuse to be home when they are drinking?" to "Do you refuse to be around your friend when they are drinking or using?"), and replaced "alcohol use" with "drinking and drug use." to account for polydrug use.

2.2.2 Substance use and problems—Two measures, the substance frequency scale and the substance problem scale were used from the Global Appraisal of Individual Needs-Intake Version (GAIN I), a reliable and valid semi-structured interview (Buchan, Dennis, Tims, & Diamond, 2002; Dennis, Funk, Godley, Godley, & Waldron, 2004). *Substance use frequency* was measured with the Substance Frequency Scale (SFS), which measures the number of days (out of the past 90) of any use across multiple substances, heavy substance use, and days of problems from use. The number of days for each item are averaged, yielding a single measure of the percent of days of substance use and substance use problems averaged across multiple substances (range = 0 to 1). We measured *substance use problems* with the substance problem scale (SPS, past month version), a 16 item scale that includes the seven DSM IV Substance Dependence criteria, the four Substance Abuse criteria, and five other indicators of substance-related problems (e.g., hiding use, close ones complaining about use).

Identified clients also reported on the peers' substance use, with single item indicators from the Important People Assessment (IPA), a reliable and valid measure of social network characteristics (Longabaugh & Wirtz, 1995; Longabaugh et al., 1998). *Peer substance use frequency* was rated on a 7 point scale (0=not in past 6 month, 7=daily). *Peer substance use problem status* was rated by the identified client on a 5 point scale (1=recovering, 5=heavy user).

2.2.3 Peer attitudes toward the identified clients' use/counseling—Peers were given a 9-item scale ($\alpha = .85$) we developed called the Attitude Toward Attending Treatment as a Collateral (ATATC) scale to assess their *willingness* (1=completely unwilling, 5=completely willing; range = 9 to 45) to participate in their friend's treatment.

Additionally, identified clients reported on how the peers viewed their use and treatment. Two items from IPA asked identified clients to rate the *peer's attitude toward their use* (1 = leaves when participant uses, 5 = encourages participant to use), and the *peer's attitudes toward the participant receiving treatment* (1=strongly opposes it, 6=strongly supports it).

2.3 Data Analysis Procedures

Analyses were conducted using SPSS 17. We checked to ensure that normality assumptions were met, as well as for missing and out of range responses. Few data were missing, and some out of range responses were rectified using hard copies of the data. To reduce the influence of outliers, we winsorized the variance (Erceg-Hurn & Mirosevich, 2008), resetting values beyond two standard deviations of the mean to the closest observed value within two standard deviations. Results were not substantively different from unadjusted analyses.

Correlations between SBQ subscales and theoretically related constructs (i.e., substance use, IPA items) were examined by computing Pearson correlations. Finally, we report descriptive statistics (M, SD) for items on the SBQ and ATATC.

3. Results

3.1 Characteristics of Peers Nominated for Participation

Table 1 compares demographic and clinical characteristics of identified clients and peers. There were no significant differences between peers and identified clients on these demographic characteristics or on measures of clinical severity. Emerging adults were approximately 21 years of age, racially diverse, and economically disadvantaged. Approximately half of the participants and peers had children (50.6%). The average length of friendship reported by identified clients was 7.1 years ($SD = 5.7$). The percentages of

peers and identified clients meeting full criteria for alcohol and marijuana use disorders, the most prevalent diagnoses in this sample, were very similar. On average, peers reported a higher number of substance use disorder criteria on the Substance Problem Scale (3.0 versus 1.9 for identified clients), but the difference was not statistically significant ($p = .09$) at $p < .05$. Finally, peers reported a similar number of days of binge drinking and total number of days of abstinence when compared to identified clients.

3.2 Peer Reactions to the Identified Clients' Substance Use

Table 2 reports item means and standard deviations for the Significant Other Behavior (SBQ) measure by peer substance use disorder (SUD) status, as well as the percentage of peers that endorsed it was "likely" or "highly likely" that they engaged in each of these behaviors. Peers with SUD indicated higher item means for only two items. Contrary to expectations, they said they were more likely than peers without SUD to enjoy their friends company when their friend (i.e., the identified client) was not drinking or using, and were more likely to make alternate plans when the identified client was using. Consistent with exploratory hypotheses, peers were more likely to respond to the identified clients' use in ways that supported sobriety, and were less likely to withdraw attention from their friends or punish substance use. Behaviors that supported substance use (SSU) were also frequently endorsed, albeit at lower percentages than supporting sobriety (SS) behaviors.

SBQ Subscales—There were no significant differences on any SBQ subscale score between peers with and without SUD. However, due to the limited statistical power, we note that standardized mean differences were in the small to moderate range. Peers without SUDs were less likely to support substance use of the identified client. However, and unexpectedly, they were also less likely to punish use, engage in behaviors supportive of abstinence, or withdraw from the identified client. For the SBQ scales, internal consistency estimates were lower for the punish substance use ($\alpha = .62$) and withdrawal from friend ($\alpha = .63$) scales compared to the support sobriety ($\alpha = .79$) and support substance use scales ($\alpha = .89$).

Table 3 presents correlations between the SBQ scales and theoretically related measures, including: measures of the peer and identified clients' substance use, peer willingness to participate in treatment (ATATC), and peer attitudes toward the client's substance use and treatment need (IPA). Correlations for dyads where the peer had a lifetime substance use disorder appear above the diagonal. Small to moderate positive correlations were observed between Supporting Substance Use (SSU) and multiple measures of peer substance use and peer substance related problems (see column 3). These correlations were stronger for dyads where peers were diagnosed with substance use disorders (see row 3). In other words, higher substance use by peers was associated with more behaviors that supported the identified client's substance use. Furthermore, the SBQ *support substance use* scale was positively correlated with more accepting peer attitudes toward participants' use ($r_{peerSUD-} = .58$ and $r_{peerSUD+} = .60$), and negatively correlated with attitudes toward the participant receiving treatment ($r_{peerSUD-} = -.32$ and $r_{peerSUD+} = -.51$). In essence, peer-reported support for substance use was positively associated with client reports on whether these peers encourage them to use substances and negatively associated client-report peer supportiveness for their treatment. As expected, the peer-report SS scale was positively correlated with peer willingness to attend their friends' treatment sessions ($r_{peerSUD-} = .38$ and $r_{peerSUD+} = .37$). In other words, higher peer willingness to attend sessions is associated with higher endorsement of using positive reinforcement attempts (SS) to influence the identified client's substance use. In further support of the SBQ subscale's validity, the SBQ withdrawal scale was negatively correlated with the peer attitude toward the identified clients substance use ($r_{peerSUD-} = -.29$ and $r_{peerSUD+} = -.43$) and positively correlated with

peer attitude toward treatment ($r_{\text{peerSUD+}} = .78$). That is, the less tolerant peers were about participants' use, the more they supported treatment.

3.3 Peer Willingness to Attend Adapted Behavioral Family Treatments

Identified clients perceived peers as less supportive of their treatment (i.e., *peer treatment attitude*; 1=strongly opposes it, 6=strongly supports it) if they were diagnosed with an SUD ($\text{Mean}_{\text{peerSUD-}} = 5.3$, $\text{Mean}_{\text{peerSUD+}} = 4.5$, $p < .05$). However, the average response to this item for peers with SUD (i.e., 4.5) indicates that clients perceived that even these peers with SUD would be supportive of their receiving substance misuse treatments. (Excepting this difference, there were no statistically significant mean differences for any variable in Table 3 for dyads with and without peers with SUD. Findings are not shown, but are available upon request.) Additionally, on the peer-report Attitudes Toward Attending Treatment as a Collateral measure, the average scale score was 38.5, where the highest possible scale score is 45, indicating complete willingness to participate in all facets of the identified clients treatment. Peers with SUD were slightly, albeit not statistically significantly, less willing to participate (See table 4). At the item level, peers were more reluctant to participate in treatment activities that encouraging them to avoid the identified client when he or she was using or to "refrain from nagging" their friend.

4. Discussion

We found support for our study hypotheses. First, peer use was associated with support substance use (SSU) behaviors. Second, those peers with higher support substance use behaviors prior to assessment reported less favorable attitudes toward their friend, the identified client, receiving treatment. Third, we posited that peers would be unlikely to use punitive or withdrawal strategies to influence the identified client's use, as the nature of peer relationships are different from filial relationships. Although it was not possible to do a direct comparison between peer and filial responses, we found very low peer endorsement (Table 2) of PSU and WFF subscale items. Finally, overall peer willingness to participate as CSOs in their emerging adult friends' treatments was high, and item response patterns shed light on the behavioral family treatment activities to which they are most amenable.

This study makes two novel contributions. First, this study documents the feasibility of recruiting peers to participate as CSOs in emerging adults' treatment episodes and their high willingness to perform specific tasks associated with adaptations of behavioral family treatments like CRAFT (Smith & Meyers, 2004). That is, Table 4 shows that peers with and without substance use disorders are willing to help their friend engage in rewarding non-using activities, commit to not using substances around them, and provide positive reinforcement to the client for not using. Second, this study is the first of its kind to use the SBQ with peers of emerging adults, providing evidence of both its construct validity, as well as data on family theory concepts that may be less relevant in peer relationships. That is, a lower percent of peers endorse the use of punitive or withdrawal strategies to influence their friend's substance using behavior, relative to the use of positive reinforcement strategies. Though not a novel finding, this study also found, on average, peers who are available to participate as CSOs are likely to have substance use problems themselves. The key implications of this study, discussed below, pertain to whether it is appropriate to recruit substance using peers to participate in their friends' treatment episodes, and also what the target of such interventions should be if peers are enlisted in support roles.

4.1 Appropriateness of Including Substance-Involved Peers in Helping Roles

Most interventions attempting to reinforce client treatment efforts through leveraging concerned significant others (CSO) have deliberately excluded substance-using CSO's

(Galanter, 1993; Copello, Orford, Hodgson, & Tober, 2009; Miller, 2004). To our knowledge, however, the evidence supporting the failure of treatments where both individuals in dyads are using is mainly anecdotal (Glanter, 1993; Klostermann, Kelley, Mignone, Pusateri, & Wills, 2011) or has only focused on treatment process outcomes (i.e., treatment satisfaction) rather than clinical outcomes (Magill, Mastroleo, Apodaca, Barnett, Colby, & Monti, 2010). Furthermore, one small trial found that heavy drinking peers and identified clients receiving peer-enhanced motivational interviewing (PMI) reduced their number of drinking days and heavy drinking days (50% and 57%) more than peers and identified clients (10% and 25%) receiving individually-delivered MI (O'Leary-Tevyaw et al., 2007). Findings were not significant due to low power. However, including substance-using peers was beneficial rather than harmful.

Notwithstanding the need to closely monitor clinical safety concerns associated with including substance-using peers, such trials may be important for two reasons. First, this study's findings provide limited support for the notion that peers are agreeable to assisting in their friend's treatments, even despite reporting similar levels of substance use as the identified clients. Second, it may be that we can expand the reach of treatment by including peers in their friends' treatment episodes. With abysmal treatment engagement rates nationally (Edlund, Booth, & Feldman, 2009), O'Leary-Tevyaw and colleagues' (2007) findings that emerging adult peers CSO's reduced their substance use, and our findings that identified clients bring peers with similar levels of substance use, research is needed to test whether dyadic-based treatments extend therapeutic benefit to those peers who would otherwise not present for treatment.

4.2 Intervention Targets for Peer-Enhanced Treatments

Behavioral family treatments such as CRAFT (Smith & Meyers, 2004) typically teach CSOs three related strategies including refraining from heated discussions about the substance use, increasing enjoyable drug and alcohol-free activities, and refraining from behaviors that prevent the client from experiencing negative consequences. Peers in this study reported low levels of punitive and withdrawal-type responses. This may be both due to the high levels of substance use by peers, as well as the nature of these peer relationships. Prior research shows that substance use among spouses of substance misusers is negatively associated with efforts to punish substance use, and weakly associated with withdrawal behaviors (Rychtarik and McGillicuddy, 1997). In addition to how their personal substance use influences their response to the client's use, peers may also have less of an investment in altering a substance-using friend's behavior through either strategy because of a differing type of relationships and frequency of contact with the identified client when compared to spouses, cohabitating partners or other blood-related CSOs. Here it was rare for peers to report punishing substance use, so it seems that peer-enhanced treatments will not need to spend time reducing negative communication patterns that surround substance use. It may be more productive to work toward increasing peer participation in drug and alcohol-free activities with the identified client and reduce peer behaviors that support the client's use (i.e., using alongside the client, reminiscing about fun times when using). Addressing these change targets may serve to reduce the substance use of both parties in these dyads.

This study also found that heavier-using peers, and those with SUD themselves, reported more reluctance to participate in their friends' treatments. Thus, motivational enhancement strategies targeting peer engagement may be indicated if identified clients select substance-using peers for participation as CSOs. For example, Motivational Interviewing (MI) is efficacious in resolving ambivalence about behavior change (Miller & Rollnick, 2002). In this context, MI may be used with peers early in treatment to elicit reasons why they would benefit by participating in their friend's treatment. Little work has been done on using MI in engaging CSOs. Given the efficacy of brief MI protocols, providing it to non-treatment

seeking peers of emerging adults has the potential to expand the reach of substance misuse treatments.

4.3 Limitations

This study's findings must be interpreted in light of its limitations. First, although the sample size of peers in this study is comparable to others (Orford et al., 2005) it was small and may not generalize. Related to the small sample, several small effects presented in Tables 2-3 failed to reach statistical significance. Further, these findings only apply to individuals ages 18-25 that received substance use disorder screenings in not-for-profit settings. Thus, although caution was taken to select participants that were likely to have substance use disorders and need treatment, close to 40% of both peers and identified clients self-reported no lifetime substance use disorders. However, both peers and identified clients used substances on approximately 20% of the past 90 days, which is comparable to the reported use of emerging adults in outpatient treatments (Dennis et al., 2008). It is also unclear whether the favorable peer reports of willingness to attend their friends' treatments would translate into good retention in an actual trial of a peer-enhanced treatment. Additionally, we did not know the reason we failed to recruit 21.8% of eligible participants, raising the possibility that some individuals did not have a peer they could refer to this study. Finally, this study could not investigate whether changes in SBQ scores could predict subsequent use by the participant, or whether the SBQ scores for peers will change as a result of participating as a CSO. Future research should address these limitations.

5. Conclusion

We found evidence that substance using peers engage in some behaviors that would support a friend's treatment efforts, and high peer willingness to participate in such treatments. Notwithstanding limitations, this study supports testing peer-enhanced treatments for emerging adults with substance use disorders, which may extend treatment benefits to non-treatment seeking peers.

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Table 1**Demographic Characteristics and Diagnostic Severity of Analysis Sample**

	Participants	Peers*
	(n = 42)	(n = 42)
	(% or M (SD))	(% or M (SD))
Male	57.1%	59.5%
Age	20.8 (1.9)	21.3 (3.7)
Race/Ethnicity **		
Caucasian	57.1%	59.5%
African-American	40.5%	42.9%
Hispanic	7.1%	2.4%
Native American	11.9%	9.5%
Nonwhite	42.9%	40.5%
Income in past 90 days (Dollars)	2292.3 (2424.4)	3064.0 (2795.1)
Received Public Assistance	33.3%	26.2%
Has children	58.8%	42.4%
Number of Children	1.0 (1.1)	0.7 (1.1)
Substance Frequency Scale	.22 (.18)	.20 (.18)
Substance Problem Scale	1.9 (2.6)	3.0 (3.5)
Days gotten drunk/5+ drinks	10.3 (18.5)	10.1 (15.7)
Days Abstinent (out of past 90)	52.5 (33.6)	49.1 (35.5)
Alcohol Dependence-Lifetime	19.0%	14.3%
Alcohol Abuse-Lifetime	33.3%	35.7%
Marijuana Dependence-Lifetime	23.8%	21.4%
Marijuana Abuse-Lifetime	28.6%	21.4%

* No statistically significant differences for any variables at $p < .05$ level

** categories do not add to 100% due to participants' ability to endorse multiple races

Table 2

Differences in SBQ Subscale Scores and Mean Item Responses (n=42) by Peer Lifetime Substance Use Disorder Status

Item (Do you.... 1=highly unlikely, 5=highly likely)/Scale	Peers (SUD-) n=18	Peers (SUD+) n=24	Uses Strategy ^a / Cohen's d n=42
stop your friend's drinking and drug use by getting angry (PS)	1.7 (.89)	1.8 (1.1)	7.3%
have arguments regarding drinking and drug use when your friend is using (PS)	1.8 (1.2)	1.9 (1.1)	14.6%
show how unhappy you are when your friend is drinking or using drugs (PS)	2.4 (1.6)	2.5 (1.1)	30.0%
scare your friend from drinking or using drugs by warning (PS)	1.8 (1.2)	2.1 (1.2)	14.6%
tell your friend about things they did when drunk or high (PS)	3.7 (1.4)	3.6 (1.4)	68.3%
spend more time with your friend when they are not drinking or using (SS)	3.0 (1.4)	3.6 (1.1)	53.6%
do things your friend likes when your friend is not drinking or using (SS)	3.3 (1.3)	3.9 (1.0)	65.9%
give your friend compliments when they are not drinking or using (SS)	3.6 (1.5)	3.7 (1.3)	68.3%
enjoy your friend's company when they are not drinking or using (SS)	3.5 (1.3)	4.4 (.93) ^b	73.2%
do things for your friend when they are not drinking or using (SS)	3.5 (1.3)	3.9 (1.2)	68.3%
support your friend when he or she is having trouble staying sober (SS)	3.6 (1.5)	4.3 (1.0)	80.5%
arrange non-drinking or using social outings (SS)	3.4 (1.4)	3.5 (1.3)	58.6%
When your friend is not drinking or using, do you enjoy each other (SS)	4.4 (1.0)	4.3 (1.1)	88.8%
When your friend is drinking or using, do you join him/her (SSU)	2.9 (1.7)	3.4 (1.3)	51.3%
bring alcoholic beverages or drugs to your friend's house (SSU)	2.3 (1.6)	2.9 (1.5)	41.5%
buy alcohol for your friend when you are at bars, etc (SSU)	2.3 (1.6)	2.6 (1.5)	36.6%
do things your friend likes when your friend is drinking or using (SSU)	2.5 (1.6)	3.4 (1.2)	48.8%
tell your friend it is ok to have "just two or three" (SSU)	2.2 (1.6)	3.0 (1.2)	36.6%
tell your friend they are fun to be with when they are drinking or using (SSU)	2.4 (1.5)	2.7 (1.2)	31.7%
leave social situations when your friend is drinking or using (WFF)	2.2 (1.5)	2.5 (1.2)	24.4%
refuse to be around your friend when they are drinking or using (WFF)	2.0 (1.5)	2.1 (1.2)	14.7%
keep out of your friend's way when he or she is drunk or high (WFF)	2.4 (1.5)	2.4 (1.2)	22.0%
make other plans to go out alone or with others when your friend has been drinking or using (WFF)	2.1 (1.2)	3.2 (1.4) ^b	30.0%
refuse to take care of your friend when they are drunk or high (WFF)	1.9 (1.5)	1.7 (1.2)	14.7%
Punish Substance Use	11.4 (3.3)	12.2 (4.3)	$d = -.25$
Support Sobriety	28.2 (7.2)	31.5 (5.4)	$d = -.46$
Support Substance Use	14.7 (7.5)	17.9 (6.5)	$d = -.43$
Withdrawal from Friend	10.6 (4.2)	11.9 (4.3)	$d = -.31$

PS-Punish Substance Use, SS-Support Sobriety, SSU-Support Substance Use, WFF-Withdraw from Friend,

^a percent of total peer sample responding it was "likely" or "highly likely" to use this strategy in response to friend's substance use or Cohen's d for Standardized mean differences for scale scores,

^b statistically significant at $p < .05$

Table 3

Correlations (n=42) between Study Variables by Peer SUD status

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Punish Substance Use (SBQ)	*	.01	.25	.43	.01	.29	.29	.19	.14	-.05	.23	-.18	.12
2. Support Sobriety (SBQ)	.41	*	-.26	.09	-.20	-.25	-.12	-.27	.37	-.09	-.13	-.37	-.34
3. Support Substance Use (SBQ)	.07	-.08	*	-.66	.40	.62	.62	-.51	-.29	-.06	.56	.39	.52
4. Withdrawal From Friend (SBQ)	.09	.16	-.38	*	-.57	-.52	-.43	.78	.26	.29	-.26	-.36	-.26
5. Peer Drug Status (IPA)	.07	-.17	.33	.02	*	.67	.62	-.30	-.32	-.16	.06	.32	.36
6. Freq of Peer Use (IPA)	-.26	-.39	.29	-.04	.64	*	.66	-.31	-.18	-.14	.26	.42	.50
7 Peer Attitude (IPA)	-.16	-.52	.58	-.29	.45	.57	*	-.34	-.56	-.32	.29	.32	.59
8. Peer treatment attitude(IPA)	.36	.47	-.32	.03	-.33	-.35	.57	*	.28	.26	-.02	-.37	.17
9. Attitude toward participating (ATATC)	.01	.38	.21	-.09	.17	-.13	.12	.38	*	.17	-.39	-.32	-.45
10. SFS Participant	.34	.21	.04	.12	.33	-.01	.00	.18	-.05	*	.09	.34	.16
11. SFS Peer	-.10	-.29	.64	-.13	.38	.40	.69	-.38	-.06	.17	*	.39	.51
12. SPS-Participant	.18	-.10	.32	-.01	.68	.39	.37	-.09	-.22	.48	.37	*	.41
13. SPS-Peer	-.02	-.11	.35	-.17	.45	.50	.58	-.29	.11	.04	.61	.32	*
Means (SD)	11.8 (3.8)	30.1 (6.4)	16.5 (7.0)	11.3 (4.3)	3.3 (1.1)	4.0 (2.3)	3.4 (1.0)	4.8 (1.1)	38.6 (5.0)	.21 (.18)	.20 (.18)	1.8 (2.5)	3.0 (3.5)

1. Emboldened correlations are significant at $\alpha < .05$, and italicized correlations are significant at $\alpha < .01$.

2. Correlations under the diagonal are for the subgroup of peers without Substance Use Disorders (SUD, n=18), and those above the diagonal are for the subgroup of peers with SUD (n=24).

3. SBQ = Significant Other Behavior Questionnaire, IPA = Important People Assessment, SFS = Substance Frequency Scale, SPS = Substance Problem Scale (Past Month version), Peer Attitude = Identified Client-report measure of how the peer views client's substance use, Peer Treatment Attitude = Identified client report measure of how peer views their treatment.

Table 4 Means (SD) from the Attitudes toward Attending Treatment as a Collateral (ATATC; $\alpha=.81$) items and scale

Item (<i>How willing would you be to....; 1=not willing at all, 5= completely willing</i>)	Peers (SUD-) n=18	Peers (SUD+) n=24
attend three of friend's counseling sessions	4.6 (.62)	4.5 (.66)
hear your friend's treatment recommendations	4.5 (.62)	4.5 (.85)
help brainstorm about things he/she could do instead of using alcohol or drugs	4.4 (.86)	4.3 (1.0)
spend time with your friend by doing things that don't involve alcohol and drugs	4.7 (.46)	4.6 (1.0)
commit to not drinking or using drugs around your friend	4.7 (.46)	4.2 (1.2)
avoid spending time with your friend when she/she is drinking or using drugs	3.3 (1.6)	3.3 (1.5)
refrain from "nagging" your friend about their use	4.0 (1.3)	3.4 (1.5)
meet with a counselor alone to learn strategies to help your friend get back in treatment	4.4 (.71)	4.0 (1.0)
tell your friend what positive changes you've seen due to stopping drinking or using	4.7 (.46)	4.6 (1.2)
ATATC Scale ($\alpha=.85$; range: 9,45)	39.5 (5.2)	37.9 (4.8)

(1=completely unwilling to 5= completely willing)