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Group Cohesion and Climate in Cognitive Behavioral Therapy for Individuals with a First-Time DUI

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Abstract

Few studies have examined group cohesion and climate in the substance use disorder treatment literature. We examined whether group cohesion and climate are associated with increased self-efficacy outcomes and reduced drinks per week, binge drinking and DUI behaviors, in a sample of individuals with a first-time DUI receiving either cognitive behavioral therapy (CBT) or usual care. Additionally, we examined whether CBT moderates these relationships. Group measures and drinking outcomes were not significantly associated. This study is the first to provide an in-depth analysis on group processes in DUI settings, and as such, provides important insights into how group processes may differ in a mandated DUI context.

Keywords

Group Process; Alcohol Use Disorders; DUI Programs; Cognitive Behavioral Therapy; Group Climate; Group Cohesion

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Group therapy is an important modality for substance use treatment programs (Weiss, Jaffee, Menil de, & Cogley, 2004) and has been shown to be cost-efficient in the community (Miller, Sorenson, Selzer, & Brigham, 2006; Weiss et al., 2004). Inherent to the therapeutic process are peer support and encouragement, which might be especially important for individuals coping with substance use disorders (SUDs), given they often need to rebuild their social networks and strengthen supportive relationships (Kelly, Deane, & Baker, 2015; Sugarman et al., 2016). Group processes (i.e., alliance, cohesion, and climate) can also facilitate the delivery of therapeutic strategies, thus indirectly affecting treatment outcome

(Burlingame, McClendon, & Alonso, 2011; Cook, Heather, & McCambridge, 2015; Kelly et al., 2015).

The substance use literature widely acknowledges that working alliance, also known as therapeutic alliance, contributes to treatment process and often outcomes (Prince, Connors, Maisto, & Dearing, 2016). Working alliance captures collaboration, partnership, and consensus regarding treatment goals and tasks between the therapist and client (Crowe & Grenyer, 2008; Horvath, Del Re, Flückiger, & Symonds, 2011). Studies evaluating working alliance in individual therapy have found that alliance is positively associated with SUD treatment attendance and retention (Cook et al., 2015; Prince et al., 2016), and improved alcohol use outcomes (Ilgen, McKellar, Moos, & Finney, 2006; Maisto et al., 2015).

Working alliance is intended for individual therapy rather than group therapy because of its focus on the client-therapist relationship (Gillaspy, Wright, Campbell, Stokes, & Adinoff, 2002). There is a group analogue of working alliance, group alliance, that measures group members alliance with one another (Budman et al., 1989) and their therapist (Gillaspy et al., 2002). Group alliance has been correlated with cohesion (Gillaspy et al., 2002).

Group-oriented processes, such as cohesion and climate, characterize the relationships among group members. Group cohesion describes sense of bonding, working together toward common goals, mutual acceptance, and group affiliation (Burlingame et al., 2011; Norton & Kazantzis, 2016). Group climate refers to the relationship between group members and describes the group's behaviors including how much members engage in self disclosure and confrontation, and how much conflict and distrust is present between members (MacKenzie, 1983). The main difference between cohesion and climate is that cohesion is focused on the unity of a group while climate is more about the behavior of group members.

Few studies have examined group cohesion and climate in the SUD treatment literature, but studies in the mental health literature show that group cohesion and climate are associated with fewer mental health and grief symptoms (i.e. depression, anxiety, self-esteem; intrusion and pathological grief), and improved quality of life (Burlingame, Fuhrman, & Mosier, 2003; Gillaspy et al., 2002; Joyce, MacNair-Semands, Tasca, & Ogrodniczuk, 2011; Ogrodniczuk & Piper, 2003; Taube-Schiff, Suvak, Antony, Bieling, & McCabe, 2007). There is also evidence that group cohesion and climate may differ by type of treatment delivered. Higher group cohesion and climate are more positively associated with process-oriented groups such as cognitive behavioral therapy, psychodynamic and interpersonal therapy, when compared to other more didactic-oriented groups (Burlingame, McClendon, & Yang, 2018).

Studies examining group processes in SUD treatment are sparse and generally find mixed results regarding the relationship between group processes and outcomes. For example, in a small study of 49 men in a residential substance use treatment program using an interactional group therapy approach, group cohesion was not significantly associated with drug and alcohol use consequences (Gillaspy et al., 2002). On the contrary, Rice and Tonigan (2012) in a prospective study of 253 alcohol-abusing or dependent adults attending

Alcoholics Anonymous implementing group drug counseling, found that group cohesion predicted increased future attendance and attendance was associated with increased abstinence. Rynes, Tonigan, and Rice (2013), in a study of 130 adults recruited from Alcoholics Anonymous meetings, substance use treatment programs and the broader community, showed group climate (specifically the engaged factor) predicted decreased alcohol use.

Variability in how group processes are measured in the SUD literature make it difficult to discern the effects of group processes on SUD outcomes. Group-oriented processes are analyzed with some studies treating processes as possible mediators (Maisto et al., 2015), predictors (Connors, Carroll, DiClemente, Longabaugh, & Donovan, 1997; Sotskova, Woodin, & Cyr, 2016), or as outcomes (Clem, Smith, & Richards, 2012; Sobell, Sobell, & Agrawal, 2009). Moreover, the measures utilized to capture group processes vary, with some studies addressing group cohesion via a group climate measure (Burlingame et al., 2018; Clem, Smith, & Richards, 2012; Sobell et al., 2009). Although using a climate measure to study cohesion neglects differences in the relationship structures captured by each group process, group climate measures are frequently used for cohesion. Yet measures of cohesion and climate tend not to be simultaneously analyzed, making it impossible to determine if similar relationships are being assessed (Burlingame et al., 2018).

In this paper, we examine whether group cohesion and climate are associated with alcohol use and self-efficacy outcomes in a sample of individuals with a first-time DUI receiving cognitive behavioral therapy (CBT) or usual care (UC). We have two research questions: 1) Is group cohesion or group climate at 4-month follow-up associated with alcohol and self-efficacy outcomes at 10-month follow-up? 2) Are the associations comparable across CBT and UC? We hypothesize that group cohesion and climate will be associated with alcohol and self-efficacy outcomes, and that there will be a significant interaction with CBT such that participants receiving CBT will report increased ratings on group cohesion and climate.

Method

Setting and Participants

We analyze data from Project REACH (Rethinking Avenues for Change), a study that compared a 12-session group cognitive behavioral therapy (CBT) to a usual care (UC) group for individuals enrolled in a three-month DUI program for a first-time DUI conviction and who used alcohol in the last year (Osilla et al., 2016; Osilla, Kulesza, & Miranda, 2017). DUI clients were screened on the AUDIT-C (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998) and eligible for the study if they scored 4 or more. A score of 4 or more corresponds to 84.3 ($SE = 1.1$) sensitivity and 82.5 ($SE = 0.4$) specificity for having a DSM-5 (<http://www.dsm5.org>) alcohol use disorder (Dawson, Smith, Saha, Rubinsky, & Grant, 2012). Clients were also eligible if they were 21 years or older and completed fifth grade or above. Participants were recruited from DUI programs located at three locations in Ventura County, California.

A total of 330 English speaking clients were eligible to participate and randomized into either the three-month CBT ($n = 163$) or UC ($n = 167$) across three locations. Of the 330

clients who entered the program, our analytic sample consisted of the 300 (91%) clients who completed demographic, DUI, and alcohol use outcome data at baseline, 4-month and 10-month follow-up. Of the 300 clients, 150 were randomly assigned to CBT and 150 to UC, with randomization stratified by DUI program location. Participants attended CBT and UC groups on a rolling basis. CBT and UC groups were open to and attended by clients not enrolled in the study. Eighty-five clients (28%) enrolled within 3 months of their arrest date, 99 (33%) enrolled between 3 and 6 months of their arrest date, and 116 (39%) enrolled six months or later after their arrest date.

Measures

Client characteristics.—Race/ethnicity, gender, and age were recorded in the baseline survey. We categorized race/ethnicity into Hispanic, non-Hispanic White, and Other. We evaluated baseline readiness to change using the motivation ladder. Readiness to change has been shown to have good psychometric properties and has been used among justice involved populations. This single-item measure categorizes participants into 5 stages (pre-contemplation, contemplation, preparation, action and maintenance) (Slavet et al., 2006).

Outcomes.—We examined nine outcomes. Drinking outcomes were drinks per week and binge drinking in the last month. DUI behavior outcomes were DUI behaviors in the last month and DUI behaviors in the last six months. The self-efficacy outcomes were five alcohol abstinence self-efficacy scores that quantified the difference between a client's confidence to not drink and their temptation to drink. All outcomes were self-reported.

Drinking Outcomes.—Drinks per week is the typical number of drinks a participant consumes in a week over the last 30 days obtained by summing participant responses for a typical number of drinks consumed each day of a typical week (Collins, Parks, & Marlatt, 1985). Studies examining alcohol consumption often utilize drinks per week as a measure for alcohol use (Boyle, LaBrie, Froidevaux, & Witkovic, 2016; Carey, Carey, Maisto, & Henson, 2006; Harris, Walters, & Leahy, 2008) including a recent study on individuals with a first-time DUI (Smart, Osilla, Johnson, & Paddock, 2018). Binge drinking, a validated alcohol use measure (Bradley et al., 2007; Frank et al., 2008; Lundin, Hallgren, Balliu, & Forsell, 2015), is an ordinal variable that consists of 4 levels of drinking: weekly binge drinking, monthly, less than monthly and never. A participant engages in binge drinking if they reported consuming five or more drinks in a single occasion (Dawson, Grant, Stinson, & Zhou, 2005).

DUI Behaviors.—We use a subset of measures from the Behaviors & Attitudes Drinking & Driving Scale (BADDs) (Jewel & Hupp, 2005) to obtain the number of DUI behaviors in the past month and past six months; scale reliability was acceptable based on Cronbach's α ($\alpha = .70$).

Self-efficacy.—The self-efficacy scores were obtained via the 12-item brief Abstinence Self-Efficacy Measure (McKiernan, Cloud, Patterson, Golder, & Besel, 2011). Four out of the five self-efficacy outcomes are scenario based; they are negative affect, social/positive, physical/other, and urges drinking refusal self-efficacy scores. For each confidence and

temptation self-efficacy item, respondents used a five-point rating scale ranging from “not at all” to “extremely” confident or tempted. The scenario-based drinking refusal self-efficacy scores were obtained by subtracting the temptation score from the confidence score, and thus, range from –4 to 4. The fifth self-efficacy score is total drinking refusal self-efficacy that averages over the four scenario-based scores, and so ranges from –16 to 16; higher scores correspond to higher self-efficacy ($\alpha = .81$).

Group Cohesion.—We measured group cohesion via the Therapeutic Factors Inventory-Short Form (TFI-S) (Joyce et al., 2011) at 4-month follow-up. The TFI-S partitions cohesion into four factors based on its 23 items, with each item scored on a 7-point scale ranging from “strongly disagree” (1) to “strongly agree” (7). The four cohesion factors of the TFI-S are instillation of hope, secure emotional expression, awareness of relational impact, and social learning ($\alpha = .96$); higher scores indicate a more cohesive group. Each cohesion factor is calculated based on weighted averages of all of the 23 TFI-S items. A client has a high instillation of hope score if they feel that their group inspires them and helps them think more positively about their future. Secure emotional expression quantifies the level of security and belonging a client feels in the group setting. Awareness of relational impact relates to whether a client feels the group teaches them about the impact of other people in their lives. A high social learning score is indicative of a client who sees the same patterns in their outside life, in their group, and who is learning how to handle their outside life from the group setting.

Group Climate.—The group climate construct was measured via the Group Climate Questionnaire - Short Form (GCQ-SF) (MacKenzie, 1983) at 4-month follow-up. Group Climate consists of three factors: engaged ($\alpha = .80$), conflict ($\alpha = .74$), and avoiding ($\alpha = .33$). Participants rated each item on a 7-point Likert scale ranging from “not at all” to “extremely”. Engaged refers to the clients’ engagement with one another, that is, whether members like and care about each other and if they jointly try to reason through the things they do; higher engaged scores indicate a more involved group. Conflict captures whether a client believes there is friction and anger between group members and if the members are distant and withdrawn from each other; larger scores suggest stronger conflict. Finally, avoiding, captures whether members avoid talking about important issues and are constantly looking to the counselor for direction; lower scores imply group members address important issues on their own. Reliability of the avoiding group climate measure, as measured by Cronbach’s α ($\alpha = 0.33$), is low.

Cognitive Behavioral Therapy Group

The CBT group consisted of twelve 90-minute group manualized sessions developed for the study (Osilla et al., 2017). The CBT was adapted from prior CBT treatments in alcohol treatment settings (Hepner et al., 2011; Monti, Kadden, Rohsenow, Cooney, & Abrams, 2002). The goal of the CBT groups was to decrease risk for future driving under the influence. Each session started with member introductions, practice/homework review, and the CBT circle review showing the connection between thoughts, behaviors, and mood. Participants could join at any session, and the content of each session emphasized CBT skills such as making informed choices about drinking, navigating risky situations, talking

back to harmful thoughts, coping with criticism, drink refusal skills, establishing supportive relationships, and increasing pleasant activities without alcohol. Each session ended with a session summary (e.g., one thing I learned) and practice assignments. UC counselors did not have access to CBT materials.

Usual Care

UC consisted of twelve 90-minute group counseling sessions. The sessions were didactic unstructured support groups that encouraged participants to examine their own personal attitudes and behaviors and receive support for their alcohol or drug problems (California Code of Regulations [CCR], 2012, Subchapter 3 Article 1 § 9854). In our focus groups with UC clients, participants reported that counseling sessions were heavily focused on the consequences of DUI and heavy drinking (Osilla, D'Amico, Diaz-Fuentes, Lara, & Watkins, 2012). No specific treatment for AUDs, CBT or otherwise, was provided by the DUI programs in the same guided and structured manner as our CBT group.

Statistical Analysis

Data were examined for completeness. Winsorization was conducted on outcomes with extreme outliers (e.g., number of drinks per week). Then, t-test and Chi-square tests were used to compare group types on client characteristics and outcomes measured at baseline. There was little to no missing values in the data for the 300 clients who completed all three stages of the study. Most variables had < 1% missing items, with one variable (baseline value of DUI behaviors in the last six months) missing 3% of its entries.

We used regression models to examine the relationship between the group climate and group cohesion factors with the nine alcohol use outcomes within group type (CBT or UC). The type of regression model depended on the outcome type – five outcomes are continuous, three are counts, and one is ordinal – and model fit was assessed by examining regression diagnostics. Linear regression was used to model the continuous outcomes, i.e., the five self-efficacy outcomes. Quasi-Poisson regression was used to model number of drinks per week. Poisson regression with a robust standard error correction was utilized for DUI behaviors in the past month and DUI behaviors in the past six months. In all regression models, we included the baseline value of the outcome, race/ethnicity, gender, centered age, location, baseline readiness to change, time to enrollment, and group type as predictors. We tested whether group type moderated the association between group processes and outcomes adding interaction terms to the models. Coefficient estimates, relative risks (RRs), and odds ratios (ORs) and the associated 95% confidence intervals (CIs) are reported by group type. We did not formally implement any multiple testing correction procedures. Rather, to account for multiple testing, we interpret our findings in light of expecting 5% of independent statistical tests to be significant at the $\alpha = 0.05$ level by chance alone (Wang, Lagakos, Ware, Hunter, & Drazen, 2007).

We examined whether there was variation in outcomes associated with attendance of rolling groups by fitting multiple membership models that included random effects for session attendance (Paddock & Savitsky, 2013; Hill & Goldstein, 1998). As most CBT sessions were attended by very few study participants and the session variance component estimates

were zero or near-zero, we did not model the rolling group structure in our final models. In addition, we assessed the impact of possible multicollinearity via Variance Inflation Factors (VIFs) in all regression models. Analyses were conducted in R Version 3.5.1 using built-in linear regression functions and the MASS package (Ripley et al., 2013).

Results

Table 1 shows descriptive statistics for the CBT and UC groups and overall. Of the 300 participants who completed all three stages of the study, 77 (26%) were female, 159 (53%) identified as Hispanic, and 114 (38%) identified as non-Hispanic White. Overall, the average age of the participants was 32.7 years old. Covariate distributions are comparable for CBT and UC. The most notable differences are that drinks per week at baseline was higher on average for the UC group by about 0.65 drinks, DUI behaviors in the past six months was higher on average for UC by about 2.88, and UC had more males (78% versus 70%) and longer times to enrollment. Only drinks per week at baseline was significantly different across treatment. Group climate factors ($r = -.16$ to $r = .24$, $p < .01$) and group cohesion factors ($r = .72$ to $r = .88$, $p < .001$) are significantly correlated.

Drinking Outcomes

None of the 12 tests of the association between the group climate factors with drinks per week (Table 2a) and binge drinking within UC and CBT groups were significant (Tables 2(a)–(b)). Group type did not significantly moderate these associations. Seven of the eight tests of the association between the cohesion factors and drinks per week within UC and CBT groups were not significant (Table 3(a)); the one significant result was a positive association between awareness of relational impact and drinks per week (CBT $RR = 1.27$, $p = .048$), and group type did not significantly moderate the association. All eight tests of association of group cohesion factors and binge drinking were not significant (Table 3(b)), nor were tests of moderation of this association by group type.

We found no multicollinearity issues for the models with group climate factors as the predictors of interest ($VIF < 3$). However, for the group cohesion models, the variance was inflated due to the multicollinearity between cohesion factors ($VIF > 5$). Removing a subset of the group cohesion factors for the drinks per week regression models altered the significant associations. Examining the association of each group cohesion factor on its own with binge drinking, or examining two or three at a time, did not change the results. For both outcomes, in cases where more than one group cohesion factor is included in the models, multicollinearity remained.

DUI Behaviors

Of the 12 tests of association of group climate factors and DUI behaviors, only the association between engagement and DUI behaviors in the past 6 months was significant (UC $RR = 0.46$, $p = .004$) (Tables 2(c)–(d)). Zero of the six moderation tests were significant. For group cohesion factors, one of eight tests of association with DUI behaviors in the past month was significant: awareness of relational impact within UC (UC $RR = 0.42$, $p = .021$) (Table 3(c)). Group type significantly moderated the associations of two of four

group cohesion factors with past month DUI behaviors: awareness of relational impact (CBT $RR = 1.56$ versus UC $RR = 0.42$, $p = .017$) and instillation of hope (CBT $RR = 0.51$ versus UC $RR = 1.33$, $p = .034$). For DUI behaviors in the past 6 months (Table 3(d)), none of the eight association tests with group cohesion factors and four moderation tests were significant. Multicollinearity persisted ($VIF > 5$) for the DUI behavior models with group cohesion factors as the predictors of interest. Examining the associations of each group cohesion factor on its own, or two or three at a time, with DUI behaviors did not change the results.

Self-efficacy Outcomes

None of the 12 tests of association of group climate factors with negative affect and social/positive self-efficacy in CBT or UC groups were significant (Table 4(a)–(b)). Two of the six association tests of group climate factors with physical/other concerns self-efficacy were significant: higher conflict in UC was associated with lower physical/other concerns self-efficacy (estimate = -0.43 , $p = .005$) (Table 4(c)) and higher avoiding important issues was associated with higher physical/other concerns self-efficacy in UC (estimate = 0.30 , $p = .018$) (Table 4(c)). The one of six significant association tests of group climate factors with urges self-efficacy was higher conflict in UC associated with urges self-efficacy (Table 4(d)). Two of the six association tests of group climate factors with total self-efficacy were significant: higher conflict in UC was significantly associated with lower total self-efficacy (estimate = -1.28 , $p = 0.014$) (Table 4(e)) and higher levels of avoidance in UC were associated with higher total self-efficacy (estimate = 0.90 , $p = .036$) (Table 4(e)). Zero of 15 tests of moderation in Table 4 were significant.

Table 5 shows regression results for testing associations of the four group cohesion factors with the five self-efficacy outcomes. Two of the 40 tests of association were significant: higher social learning in the UC group was significantly associated with lower negative affect (estimate = -0.37 , $p = .019$) (Table 5(a)) and in urges self-efficacy (estimate = -0.33 , $p = .036$) (Table 5(d)). None of the 20 tests of moderation by group type of the associations among group cohesion factors and self-efficacy outcomes were significant. Multicollinearity ($VIF > 5$) was once again present in the self-efficacy models with group cohesion factors. The significant associations between social learning with negative affect and urges self-efficacy changed (to not significant) when the group cohesion factors were included alone in the regression models. Examining the associations of each group cohesion factor on its own with the remaining self-efficacy outcomes did not change the results.

Discussion

The current paper sought to fill significant gaps in the substance use literature by examining how group climate and cohesion influence alcohol use outcomes in a DUI group setting. Based on the mental health literature, we hypothesized that these group processes would be associated with improved alcohol use outcomes and that CBT would moderate these relationships, but we found largely null results showing that group processes were not statistically significantly and consistently associated with improved outcomes. There were

also few differences on group processes ratings when participants attended CBT versus usual care.

We found a few small positive associations such that clients who felt more friction, anger, distance and withdrawal in the UC group reported lower self-efficacy scores at 10-month follow-up. This finding is consistent with the role of group climate conflict in the mental health literature (Beutel et al., 2006; Chapman, Baker, Porter, Thayer, & Burlingame, 2010). The remainder of the associations were somewhat unexpected, as they suggested that improving group dynamics in the UC group resulted in more negative outcomes. However, these results should be tempered by the multiple comparisons performed. We conducted 189 overall tests with 12 (6.3%) of the tests providing significant results; many of these significant effects could have occurred by chance, considering we would expect 5% of independent tests to be significant if all null hypotheses were true.

Despite these null findings, there are several important clinical insights that can be gained into why group processes were not associated with improved alcohol outcomes in a DUI setting in contrast to the mental health literature, and how future research may continue to provide insight into how group processes affect substance use outcomes. First, mean ratings were higher for cohesion (Joyce et al., 2011) and lower for climate in the DUI group than seen in the mental health literature (Johnson, Burlingame, Olsen, Davies, & Gleave, 2005; Kivlighan, London, & Miles, 2012; Thayer & Burlingame, 2014). The DUI population is a unique one in which individuals are mandated to a program for driver's license reinstatement. In California, for example, individuals convicted of a first-time DUI need to attend a 3, 6, or 9-month program. The 3-month program consists of 10 hours of group counseling, 12 hours of educational classes, 3 face-to-face interviews, and 8 hours of additional program services (group counseling, educational sessions, or a combination of the two) (CCR, 2012, Subchapter 3 Article 1 § 9851). Individuals also need to pay on average \$500 to attend these programs. Because of the time, expense, and program attendance requirements, individuals in these programs are qualitatively different than individuals seeking help in substance use treatment programs. Individuals with a DUI do not necessarily profile as clients with alcohol use disorders (DiStefano & Hohman, 2007), even though a significant proportion of individuals with a DUI are at risk for alcohol and substance use disorders (Yu & Watkins, 1996). For these reasons, individuals in DUI programs may present with different motivations (e.g., to reinstate their license) than those in substance use treatment programs (e.g., sobriety), and the group dynamics may also present with differences as well. If one is not motivated to change their drinking or prevent future DUI, one can imagine less engagement or less cohesion and poorer climate in groups. Weaker relationships with group members may potentially contribute to the null findings seen in the current study.

Future research is needed to better understand what affects group process ratings and whether higher group process ratings are associated with clinically significant outcomes. For example, studies could examine the moderating role of referral source (e.g., self-referral or mandated referral) or treatment context (e.g., DUI vs. outpatient substance use treatment) on group processes where the hypothesis would be that those who self-refer or attend substance use treatment would report higher group process ratings because of their presumably higher

engagement in the recovery process. Studies could then examine how varying levels of group process ratings are associated with outcomes. If group cohesion and group climate factors are truly associated with alcohol use outcomes, therapists can be trained to address these subscales in their groups and hopefully see more positive alcohol use outcomes. For example, if conflict is truly associated with alcohol use outcomes, then there is an unprecedented opportunity to train group counselors on reducing group conflict to potentially prevent DUI recidivism. Training providers in techniques such as Motivational Interviewing (Miller & Rollnick, 2002) to increase client engagement and readiness to change may help foster a greater sense of group cohesion and climate.

Limitations

Group climate and group cohesion factors are correlated, and thus pose collinearity issues in the models. Multicollinearity in turn affects the precision of some of our association estimates. The scope of this study is limited to individuals with a first-time DUI from one area in California and thus cannot be generalized to the larger DUI population. To fully understand the relationship between group processes on AUD outcomes, similar studies must be conducted with various therapy types on individuals who suffer from an AUD or other SUDs. The clinical implications for why group processes may differ in DUI groups relative to other groups is important and worthy of future research.

Conclusions

This work provides important insights into how group processes may differ in a mandated DUI context from prior studies showing positive associations of group processes on mental health outcomes, and offers future research direction into elucidating these associations further in the substance use literature. This study is the first to provide an in-depth analysis on group processes in DUI settings, a critical setting warranting optimal care to prevent the serious consequences facing DUI recidivism.

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Table 1

Participant Characteristics

	Total (n = 300)		CBT (n = 150)		UC (n = 150)		
Characteristic	M	SD	M	SD	M	SD	P-value
Age	32.69	12.0	32.70	11.4	32.68	12.7	.989
Drinks at Baseline	2.43	2.6	2.11	2.6	2.75	2.6	.034 *
Self-Efficacy at baseline							
Negative Affect	0.68	1.9	0.65	2.0	0.71	1.9	.790
Social Positive	-0.50	1.8	-0.55	2.0	-0.45	1.7	.639
Physical or Other Concerns	1.89	1.7	1.93	1.7	1.84	1.7	.650
Urges	1.49	1.9	1.58	1.9	1.40	1.8	.407
Total	3.94	5.6	3.96	5.8	3.92	5.4	.950
DUI Behaviors at baseline							
Past month	0.94	3.4	0.99	3.6	0.89	3.1	.810
Past 6 months	3.66	15.0	2.21	7.5	5.09	20.0	.106
	N	%	N	%	N	%	
Race/Ethnicity							.823
Hispanic	159	53 %	81	54 %	78	52 %	
Non-Hispanic White	114	38 %	57	38 %	57	38 %	
Other	27	9 %	12	8 %	15	10 %	
Gender							.113
Male	223	74 %	105	70 %	118	78 %	
Female	77	26 %	45	30 %	32	21 %	
Readiness to Change							.309
Precontemplation	63	21 %	27	18%	36	24 %	
Contemplation	150	50 %	74	49%	76	51 %	
Preparation	17	6 %	7	5 %	10	7 %	
Action	42	14 %	26	17 %	16	11 %	
Maintenance	28	9 %	16	11 %	12	8 %	
Time to Enrollment							.063
3 Months or Less	85	28 %	50	33 %	35	23 %	
Between 3 and 6 Months	99	33 %	51	34 %	48	32 %	
Greater Than 6 Months	116	39 %	49	33 %	67	45 %	
Binge Drinking at Baseline							.333
Weekly	61	20 %	25	17 %	36	24 %	
Monthly	87	29 %	42	28 %	45	30 %	
Less than monthly	87	29 %	47	31 %	40	27 %	
Never	65	22 %	36	24 %	29	19 %	

Notes. The p-value column corresponds to: a t-test testing whether row variable means are the same across treatment for continuous variables, and a chi-square test of independence between the row-variable and treatment for categorical variables.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

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Table 2

Regression Results for Drinks and DUI Behavior Outcome Models with Group Climate Factors as Predictors of Interest

Group Type	(a) Drinks Per Week Relative Risk 95% CI P-value	(b) Binge Drinking Odds Ratio 95% CI P-value	(c) DUI Behaviors in the Past Month Relative Risk 95% CI P-value	(d) DUI Behaviors in the Past 6 Months Relative Risk 95% CI P-value
Engaged				
UC	0.94 [0.80, 1.11] .473	1.00 [0.74, 1.35] .992	0.71 [0.44, 1.13] .150	0.46 [0.28, 0.78] .004 *
CBT	0.96 [0.82, 1.12] .596	0.87 [0.63, 1.21] .419	0.86 [0.53, 1.41] .556	0.77 [0.53, 1.11] .156
Conflict				
UC	0.85 [0.68, 1.07] .170	1.43 [0.96, 2.13] 0.076	0.39 [0.14, 1.08] 0.071	0.61 [0.24, 1.52] 0.286
CBT	0.98 [0.78, 1.24] .899	1.1 [0.71, 1.70] .677	0.69 [0.34, 1.39] .301	0.62 [0.29, 1.32] .216
Avoiding				
UC	0.93 [0.79, 1.11] .431	0.90 [0.64, 1.27] .559	0.97 [0.58, 1.61] .908	1.20 [0.79, 1.83] .389
CBT	1.11 [0.92, 1.34] .267	0.91 [0.64, 1.29] .586	0.99 [0.73, 1.32] .925	1.20 [0.87, 1.65] .275

Notes. Regression results for the drinks and DUI behavior outcome models with the group climate factors as predictors of interest: relative risks or odds ratios, 95% confidence intervals (CIs) and p-values.

CBT and UC are not significantly different for any climate factor and outcome combination.

$\chi^2 = 263.33$, $df = 274$ for column (a).

$\chi^2 = 689.68^{***}$, $df = 273$ for column (b).

$\chi^2 = 941.71^{***}$, $df = 275$ for column (c).

$\chi^2 = 3258.24^{***}$, $df = 269$ for column (d).

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3

Regression Results for Drinks and DUI Behavior Outcome Models with Group Cohesion Factors as Predictors of Interest

Group Type	(a) Drinks Per Week Relative Risk 95% CI P-value	(b) Binge Drinking Odds Ratio 95% CI P-value	(c) DUI Behaviors in the Past Month Relative Risk 95% CI P-value	(d) DUI Behaviors in the Past 6 Months Relative Risk 95% CI P-value
Instillation of Hope				
UC	1.06 [0.82, 1.36] .661	0.99 [0.60, 1.65] .981	<i>1.33</i> <i>[0.78, 2.27]</i> <i>.298</i>	1.56 [0.88, 2.78] .131
CBT	0.93 [0.71, 1.23] .622	1.14 [0.66, 1.97] .642	<i>0.51</i> <i>[0.25, 1.05]</i> <i>.070</i>	0.67 [0.26, 1.73] .407
Secure Emotional Expression				
UC	1.06 [0.83, 1.37] .631	0.82 [0.50, 1.33] .412	1.56 [0.90, 2.7] .116	0.56 [0.22, 1.47] .242
CBT	0.92 [0.72, 1.17] .500	1.43 [0.87, 2.37] .161	1.47 [0.80, 2.71] .212	1.49 [0.63, 3.52] .365
Awareness of Relational Impact				
UC	0.89 [0.68, 1.17] .397	1.27 [0.76, 2.11] .369	<i>0.42</i> <i>[0.20, 0.88]</i> <i>.021 *</i>	0.61 [0.28, 1.34] .218
CBT	1.27 [1.00, 1.60] .048 *	0.92 [0.55, 1.55] .765	<i>1.56</i> <i>[0.76, 3.19]</i> <i>.227</i>	0.79 [0.28, 2.22] .649
Social Learning				
UC	0.99 [0.82, 1.19] 0.897	0.91 [0.63, 1.30] 0.597	1.08 [0.76, 1.55] 0.652	1.32 [0.70, 2.50] 0.389
CBT	0.96 [0.78, 1.18] .710	0.70 [0.47, 1.04] .076	0.90 [0.46, 1.77] .768	1.33 [0.61, 2.89] .476

Notes. Regression results for the drinks and DUI behavior outcome models with the group cohesion factors as predictors of interest: relative risks or odds ratios, 95% confidence intervals (CIs) and p-values. Bold and italicized text indicates where CBT and UC significantly differ ($p < .05$).

$\chi^2 = 262.80$, $df = 271$ for column (a). $\chi^2 = 688.13^{***}$, $df = 270$ for column (b).

$\chi^2 = 925.00^{***}$, $df = 272$ for column (c). $\chi^2 = 3427.17^{***}$, $df = 266$ for column (d).

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

Table 4

Regression Results for Self-Efficacy Outcome Models with Group Climate Factors as Predictors of Interest

Group Type	(a) Negative Affect Self-Efficacy Estimate 95% CI P-value	(b) Social/ Positive Self-Efficacy Estimate 95% CI P-value	(c) Physical/ Other Concerns Self-Efficacy Estimate 95% CI P-value	(d) Urges Self-Efficacy Estimate 95% CI P-value	(e) Total Self-Efficacy Estimate 95% CI P-value
Engaged					
UC	0.17 [−0.08, 0.43] .187	−0.02 [−0.30, 0.26] .895	−0.09 [−0.33, 0.15] .471	0.05 [−0.20, 0.30] .701	−0.09 [−0.90, 0.73] .831
CBT	−0.02 [−0.28, 0.24] .891	−0.12 [−0.41, 0.16] .395	0.00 [−0.25, 0.24] .975	−0.04 [−0.29, 0.22] .781	−0.13 [−0.96, 0.70] .750
Conflict					
UC	−0.18 [−0.50, 0.14] .281	−0.21 [−0.56, 0.14] .231	−0.43 [−0.73, −0.14] .005**	−0.43 [−0.74, −0.12] .007**	−1.28 [−2.3, −0.26] .014*
CBT	0.03 [−0.34, 0.40] .880	−0.08 [−0.49, 0.32] .684	−0.14 [−0.49, 0.20] .419	−0.08 [−0.44, 0.28] .666	−0.35 [−1.54, 0.84] .560
Avoiding					
UC	0.15 [−0.11, 0.41] .267	0.10 [−0.18, 0.39] .473	0.30 [0.05, 0.54] .018*	0.18 [−0.07, 0.44] .161	0.90 [0.06, 1.74] .036*
CBT	−0.10 [−0.40, 0.20] .504	0.09 [−0.23, 0.41] .579	0.04 [−0.23, 0.31] .771	0.08 [−0.20, 0.37] .561	0.08 [−0.86, 1.01] .869

Notes. Regression results for self-efficacy outcome models with group climate factors as predictors of interest: estimates, 95% confidence intervals (CIs), and p-values.

CBT and UC are not significantly different for any climate factor and outcome combination.

$R^2 = 0.33$ for column (a). $R^2 = 0.25$ for column (b). $R^2 = 0.28$ for column (c).

$R^2 = 0.29$ for column (d). $R^2 = 0.27$ for column (e).

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

Table 5

Regression Results for Self-Efficacy Outcome Models with Group Cohesion Factors as Predictors of Interest

Group Type	(a) Negative Affect Self-Efficacy Estimate 95% CI P-value	(b) Social/ Positive Self-Efficacy Estimate 95% CI P-value	(c) Physical/ Other Concerns Self-Efficacy Estimate 95% CI P-value	(d) Urges Self-Efficacy Estimate 95% CI P-value	(e) Total Self-Efficacy Estimate 95% CI P-value
Instillation of Hope					
UC	0.16 [−0.24, 0.56] .438	−0.06 [−0.51, 0.38] .778	0.10 [−0.28, 0.48] .617	0.24 [−0.15, 0.64] .221	0.31 [−0.98, 1.61] .636
CBT	0.08 [−0.36, 0.52] .724	−0.21 [−0.70, 0.28] .399	−0.13 [−0.55, 0.29] .551	−0.07 [−0.50, 0.36] .752	−0.35 [−1.78, 1.08] .631
Secure Emotional Expression					
UC	0.06 [−0.32, 0.44] .769	0.28 [−0.14, 0.70] .195	0.15 [−0.21, 0.52] .402	0.34 [−0.03, 0.71] .075	0.66 [−0.57, 1.89] .291
CBT	0.22 [−0.17, 0.60] .268	0.06 [−0.37, 0.48] .789	0.22 [−0.14, 0.59] .230	0.20 [−0.18, 0.57] .308	0.73 [−0.52, 1.97] .249
Awareness of Relational Impact					
UC	0.32 [−0.10, 0.73] .134	−0.11 [−0.56, 0.35] .645	−0.02 [−0.42, 0.37] .910	−0.18 [−0.58, 0.23] .383	0.15 [−1.19, 1.48] .830
CBT	−0.04 [−0.46, 0.38] .852	0.19 [−0.28, 0.66] .434	0.08 [−0.32, 0.48] .688	−0.13 [−0.55, 0.28] .526	0.28 [−1.09, 1.64] .687
Social Learning					
UC	−0.37 [−0.68, −0.06] .019 *	−0.10 [−0.44, 0.24] .573	−0.18 [−0.47, 0.12] .236	−0.33 [−0.63, −0.02] .036 *	−0.86 [−1.86, 0.14] .092
CBT	−0.16 [−0.49, 0.17] .347	−0.02 [−0.39, 0.35] .917	−0.11 [−0.43, 0.21] .490	0.00 [−0.32, 0.33] .982	−0.40 [−1.47, 0.68] .466

Notes. Regression results for the self-efficacy outcome models with the group cohesion factors as predictors of interest: estimates, 95% confidence intervals (CIs) and p-values. CBT and UC are not significantly different for any climate factor and outcome combination.

$R^2 = 0.35$ for column (a). $R^2 = 0.25$ for column (b). $R^2 = 0.26$ for column (c).

$R^2 = 0.29$ for column (d). $R^2 = 0.27$ for column (e).

* $p < .05$.

** $p < .01$.

*** $p < .001$.