

Social identity differentiation predicts commitment to sobriety and wellbeing in residents of therapeutic communities

DINGLE, G A, HASLAM, C, BEST, D <<http://orcid.org/0000-0002-6792-916X>>, CHAN, G, STAIGER, PK, SAVIC, M, BECKWITH, M, MACKENZIE, J, BATHISH, R and LUBMAN, DI

Available from Sheffield Hallam University Research Archive (SHURA) at:

<http://shura.shu.ac.uk/25203/>

This document is the author deposited version. You are advised to consult the publisher's version if you wish to cite from it.

Published version

DINGLE, G A, HASLAM, C, BEST, D, CHAN, G, STAIGER, PK, SAVIC, M, BECKWITH, M, MACKENZIE, J, BATHISH, R and LUBMAN, DI (2019). Social identity differentiation predicts commitment to sobriety and wellbeing in residents of therapeutic communities. *Social Science & Medicine*, 237, p. 112459.

Copyright and re-use policy

See <http://shura.shu.ac.uk/information.html>

Social identity differentiation predicts commitment to sobriety and wellbeing
in residents of therapeutic communities

Genevieve A. Dingle^{1,3}, Catherine Haslam¹, David Best², Gary Chan³, Petra K. Staiger⁴, Michael Savic^{5,6}, Melinda Beckwith^{5,6}, Jock Mackenzie¹, Ramez Bathish^{5,6} & Dan I. Lubman^{5,6}

¹ School of Psychology, The University of Queensland

² Department of Law and Criminology, Sheffield Hallam University

³ Centre for Youth Substance Abuse Research, The University of Queensland

⁴ School of Psychology, Deakin University

⁵ Turning Point, Eastern Health

⁶ Eastern Health Clinical School, Monash University

Correspondence to: Associate Professor Genevieve Dingle, 329 McElwain Building, School of Psychology, University of Queensland, St Lucia, AUSTRALIA 4072. E: dingle@psy.uq.edu.au; Tel: +617 33657295; Fax: +617 33654466.

Running Header: Social identity differentiation and addiction treatment

Abstract

Rationale: Therapeutic communities (TC) for alcohol and other drug treatment rely strongly on social factors as agents of recovery; an approach known as ‘community-as-method’. This study adopted a social identity approach in examining the relative strength of participants’ recovery group identity and substance using group identity at admission (T1) and after six months (T2) in a TC. Objectives were to investigate whether identity differentiation - the extent to which respondents see themselves more as belonging to recovery groups than belonging to substance using groups - (a) is related to individuals’ primary substance of concern (i.e., amphetamine type stimulants; alcohol; other drugs), and (b) predicts positive indicators of recovery six months after entering a therapeutic community. Methods: 307 adults entering one of five Australian therapeutic communities (TC) completed measures of identification (user, recovery), commitment to sobriety, psychological distress, and personal wellbeing. Results: Participants’ endorsement of the user and recovery identity at T1 and T2 did not differ as a function of primary substance of concern. User identity diminished over the six months while recovery identity remained high, regardless of primary drug category. Identity differentiation measured at T2 accounted for 20-25% variance in commitment to sobriety and wellbeing, after accounting for participant demographics, addiction severity, and T1 identity variables. Conclusion: These findings highlight the importance of the relative strength of recovery over substance use related identities in supporting recovery indicators and the central role of the TC in supporting this trajectory.

1. Introduction

Substantial research confirms a strong relationship between social connectedness and health (Haslam, Jetten, Cruwys, Dingle, & Haslam, 2018; Holt-Lunstad, Smith & Layton, 2010). Berkman and colleagues' (2000) conceptual model of the relationships between social networks and health described four overarching factors: social-structural conditions (such as culture, politics and socioeconomic conditions); social network factors (e.g., size, density and complexity of social networks, and frequency and duration of contact); psychosocial mechanisms (e.g., social influence and types of social support); and pathways to health outcomes. A special issue on social networks and health in this journal examined the empirical evidence in support of Berkman et al.'s model and highlighted the variety of methods used to examine social networks (see Tsai & Papachristos, 2015). Among papers in this issue, some researchers considered the shape, size, and complexity of social networks in relation to health outcomes, while others measured the effect of changes over time in specific social ties, or goal directed interaction within networks — such as talking to others about mental health issues (Perry & Pescosolido, 2015).

Social relationships are also a key factor in addictive behaviors. Rees and Wallace (2014) found that adolescents whose social networks comprised friends who drank were also more likely to drink themselves. Moreover, they found that this normative social influence may be moderated by the presence of one or more non-drinking friends. Fujimoto and Valente (2015) adopted a multiplexity analysis (i.e., the extent to which friendship nominations and popularity rankings were congruous) to understand drinking behaviour among high school students. They found that participants' exposure to drinking through multiplex-congruous peers (i.e., close friends who were popular) also influenced their own drinking. This link between social ties and

substance misuse, has led some researchers to assess the important people (i.e. individual relationships) in a person's social network who are supportive of abstinence versus substance use as predictors of treatment outcomes (e.g., Longabaugh, Wirtz, Zywiak, & O'Malley, 2010). Further, Litt, Kadden, Tennen, & Kabela-Cormier (2016) developed an intervention called Network Support in which therapists problem-solve with patients to enable them to make new non-drinking friends to increase their sober social networks. In a trial comparing network support with case management, Litt and colleagues (2016) found support for this approach: the proportion of non-drinkers in the social network and attendance at Alcoholics Anonymous were related to abstinence following treatment. Again, this supports the notion that peer influence and norms affect addictive behaviour.

Somewhat contrasting with a social network analysis approach but similarly concerned with how social groups and communities influence health behaviours, the current study adopts a theory from the social psychology of intergroup relations – the social identity approach. The aim of the current study is to apply a social identity approach to understanding the recovery process over a six-month period among adults entering a therapeutic community for alcohol and other drug treatment.

2. Social identity approach to addiction recovery

Social groups influence treatment and recovery outcomes among those seeking treatment for a substance use disorder (e.g. Stout, Kelly, Magill & Pagano, 2011) through the primary mechanism of group identification – the subjective sense of belonging to the group. Here we adopt the UK Drug Policy Commission definition of recovery: “voluntarily sustained control over substance use, which maximizes health and wellbeing and participation in the rights, roles and responsibilities of society” (UK Drug Policy Commission 2008). Notably, those who

identify strongly with groups that promote abstinence or recovery have better outcomes (e.g., Buckingham & Best, 2017; Buckingham, Frings, & Albery, 2013). Such identification increases a person's motivation to embrace group norms that support recovery (e.g., to abstain from use of addictive substances), increasing the likelihood that they will behave in a manner that accords with those norms (e.g., seeking support when at risk of relapse). As a corollary of this, though, if people do not identify with those who are trying to facilitate recovery, they are unlikely to follow their advice (e.g., Haslam et al., 2018). The social identity approach helps to explain these diverse group influences on substance use behaviour and treatment outcomes.

The social identity framework draws on two theories of intergroup relations: social identity theory and self-categorization theory (Tajfel and Turner, 1979; Turner et al., 1987). Fundamental to these theories is the idea that social groups are as integral to a person's sense of self, or identity, as those characteristics that are unique to an individual. However, not all groups are integrated into the self in this way. Only those groups that a person strongly identifies with appear to influence their behaviour, beliefs and attitudes in ways that are in line with the group's norms, beliefs and attitudes. Important to this reasoning is the idea that group membership is typically understood in a comparative context. When a person categorizes themselves as belonging to a group (i.e., their ingroup), the value or worth of this ingroup to their 'self' is typically understood, relative to other comparison groups (i.e., outgroups). For example, if individuals identify with 'drinking', 'substance using', or 'smoking' groups, they are likely to conform to the norms and attitudes of the members of these ingroups, and to emphasise ways in which they are different from members of an outgroup (i.e., 'non-drinkers', 'non-users', 'non-smokers'). It is only by understanding when, why and how social groups have such influence that we start to see their capacity to affect recovery outcomes. If, for example, one joins a

treatment community and develops a stronger sense of connectedness with others in that community, relative to those outside that community, this strengthens one's openness to adopt a set of norms and attitudes that are more consistent with recovery goals and the development of a recovery identity.

This process is detailed in the Social Identity Model of Recovery (SIMOR; Best, Beckwith, et al., 2016). According to SIMOR, recovery from addiction is a socially negotiated process in which the balance of a person's group memberships can support or hinder a person's recovery journey over time. Early in treatment, the balance favours groups that support substance use; in turn, promoting adoption of a "using identity". However, if a person gains (or re-gains) groups supportive of recovery over time (both during and after treatment), the influence of non-using and recovery supportive groups outweighs that of the substance using groups. Using this reasoning, SIMOR argues that the balance of social group composition together with people's strength of connectedness to those groups is likely to influence the extent to which they identify as a 'user' or 'in recovery'. Support for the SIMOR model was found in the recent Australian Pathways to Recovery project (Bathish et al., 2017), in which 573 individuals in the community who identified themselves as being in recovery were asked to recall their experiences "at the peak of active addiction" (T1) as well as their current experiences "in recovery" (T2).

Participants had used substances for an average of 18 years, had been abstinent on average for 8.5 years and importantly, 83.5% of the sample were attending a 12-step group at the time of the survey. Participants typically reported that, at T1, most of their social network comprised other substance users, and they had limited involvement with other people in recovery. At T2, participants reported a reduction in the proportion of their social network comprised of substance

users along with an increase in the proportion of their social network that was comprised of other people in recovery (Bathish et al., 2017).

3. Evidence that social identity differentiation matters

Previous research has focused on the influence that a substance using identity (e.g. smoking group identity in Meijer et al., 2018), or recovery identity (e.g., Mawson et al., 2015) have on recovery trajectories. In this study, we examine *identity differentiation* – defined as the extent to which respondents endorse a recovery identity more strongly than a user identity when the two are measured simultaneously – in relation to six-month outcomes. Buckingham and colleagues (2013) found that among attendees of AA and Narcotics Anonymous (NA) groups in the UK (n = 61), a greater preference for a recovery identity, over a user identity, was associated with higher levels of self-efficacy, and this predicted both the number of months that a participant was drug-free as well as reduction in their substance use behaviour (Buckingham, Frings, & Albery, 2013). Similarly, in a second study involving 81 ex-smokers accessed via an online site, Buckingham and colleagues (2013), found recovery identity preference was related to higher self-efficacy, and this in turn was related to lower relapse (i.e., less likelihood that a person would start smoking again).

The importance of differentiation between user and recovery identities was further illustrated in a study of 132 adults entering a residential therapeutic community for alcohol and other-drug treatment (Dingle, Stark, Cruwys, & Best, 2015). At the beginning of treatment, participants identified moderately with their substance-using social groups ($M = 4.61$ out of 7). However, over successive fortnightly intervals, participants reported seeing themselves less as members of substance using groups and more as members of the recovery community. It might appear obvious that people who live in a therapeutic community for longer will feel a stronger

sense of belonging and identification with the community, but this isn't necessarily the case. It is possible to live somewhere and yet continue to feel like an outsider. For instance, clients who were mandated to enter treatment by the drug courts may never identify with the recovery community and may instead continue to view themselves as substance users despite residing at the therapeutic community for the mandated time period. Follow-up assessments were conducted with a representative subsample of 60 participants around seven months after they had left the TC. Here the extent of identity differentiation - indexed by the difference between user identity and recovery identity ratings at the follow up point, taking initial identity ratings into account - accounted for 34% of the variance in drinking quantity, 41% of the variance in drinking frequency, 5% of the variance in other-drug use frequency, and 49% of the variance in life satisfaction. Importantly, these analyses controlled for severity of substance use at admission to the TC (Dingle et al., 2015).

4. Primary drug of concern

A relevant question that remains unanswered in the literature reviewed here is whether the individuals' primary drug of concern plays a role in influencing this socially mediated process of identity differentiation during treatment. The way a person uses a substance and the social and legal context of the substance use may influence the extent to which a related user identity is experienced as more resistant to change, and/or the recovery identity more challenging to adopt. For example, drinking alcohol is legal and widely accepted in most communities, and it is possible for people who drink alcohol to carry out other tasks and roles each day. In contrast, other-drug use tends to be illicit and less widely accepted, particularly in public spaces. People who use illicit substances tend to experience a narrowing of behaviours around obtaining, using and recovering from use of these substances that makes other roles difficult to manage. There

could therefore be a relationship between participants' primary drug of concern and the extent of identity differentiation that occurs during treatment. This intriguing possibility has not been directly tested. This question may be particularly pertinent in the context that the composition of adults entering TC treatment in Australia has shifted in the past decade from pre-dominantly alcohol (37%) and opiate (24%) users (Darke, Campbell, & Popple, 2012) to the current composition of amphetamine type stimulants (38%), followed by alcohol (33%) and then opiates (17%) (Best, Haslam, et al., 2016). Whether, and how, primary substance may be related to endorsement of, and differentiation between, user and recovery identity during treatment is of interest here.

5. The current study

To recap, evidence from previous studies shows that individuals who identify more strongly with their recovery groups relative to their substance-using groups during addiction treatment show better outcomes (Buckingham et al., 2013; Dingle et al., 2015). However, these studies were conducted in single treatment settings and with relatively modest sample sizes. Further research is required therefore to establish whether user – recovery identity differentiation occurs across substance users and treatment services. This study aimed to investigate whether social identity differentiation varies according to the individuals' primary drug of concern and whether the extent of identity differentiation relates to positive indicators of recovery six months after entering a therapeutic community. Six months was selected for the second assessment because – although the program duration varied across the TCs included in the project – six months was the most commonly agreed duration for completion of the program.

We examine these questions in a large sample of adults entering residential TC treatment in five locations in Australia, (Best, Haslam, et al., 2016). At six months, 40.3% of the

participants were still in the TC (and by definition, abstinent) while 59.7% had left, making substance use behaviour an unreliable outcome. For this reason, we focused on interim indicators of positive recovery relevant to all participants at six months, namely: commitment to sobriety, psychological distress, and wellbeing. Commitment to sobriety, defined as the extent to which respondents accord motivation towards recovery their highest priority, has been found to be a predictor of percentage days abstinent from alcohol and other drugs at 3, 6, and 12 months follow up (Kelly & Greene, 2014). We predict that the extent of social identity differentiation (at time 2) will account for substantial variance in commitment to sobriety, psychological distress, and wellbeing (at time 2) after time 1 variables are accounted for (Hypothesis 1, H1). Additionally, to examine the possible influence of primary drug of concern, we grouped this variable into three categories - alcohol, amphetamine type stimulants (ATS), and other drugs - to determine if there was a relationship between primary substance used and recovery identities. This was an exploratory hypothesis, that there would be a relationship between primary substance of concern and identity differentiation during TC treatment (H2).

6. Method

6.1 Participants

The sample comprised 307 participants (68.3% male; $M_{\text{age}} = 34.75$; see Table 1). The most commonly reported primary substance was amphetamine type stimulants (38.11%), followed by alcohol (32.9%), then other substances (28.99%). The majority, 81 per cent, had been unemployed in the month before entering the TC; 31.6 per cent had dependent children. In terms of living arrangements, 44.9 per cent had lived with family before entering the TC, 14.9 per cent with friends, 22.0 per cent alone, 8.4 per cent with a partner and 2.0 per cent with recovering

peers. Participants reported a mean level of social support of 4.07 (± 1.57) out of a possible seven, indicating that participants felt they had access to reasonable social support in the period prior to admission. In terms of recovery group participation, just under half (46.8 per cent) had attended any “support groups” in the six months prior to starting treatment, of which 96.3 per cent had attended an alcohol or other drug recovery support group in the period (AA, NA, SMART, etc.). These and other details of the sample and the five TC services are presented in Best, Haslam, et al., (2016).

6.2 Measures

6.2.1 Demographic and substance use variables. Participants were asked to respond to questions about their age, gender, dependent children, highest level of education completed, country of birth, and employment status. Primary drug of concern was coded according to the system used in the Australian Treatment Outcome Profile (ATOP; Ryan et al., 2014). Indicators of substance use severity at admission were: days use of primary drug of concern over the 30 days prior to admission and number of previous therapeutic community alcohol and other drug use treatment admissions.

6.2.2 Recovery identity was a four item group identification measure from Doosje, Ellemers, and Spears (1995), adapted from the items Buckingham et al. (2013) used in relation to AA group members; i.e., ‘I would describe myself as in recovery’, ‘I identify with other people in recovery’, ‘Even if I find myself using/drinking, I still think of myself as being in recovery’, ‘Being in recovery is a central part of who I am’. In this way, the measure assessed generic recovery identification rather than identification with any particular group (such as the therapeutic community or an AA/NA group) – which could continue to be used even if the participant dropped out of the therapeutic community during the study. Internal consistency of

this measure was modest, Cronbach's $\alpha = 0.60$ at T1 and $\alpha = 0.74$ at T2, and the items were summed and then divided by 4 to give a mean score at each time point.

6.2.3 *User identity* was measured using four items also from Buckingham et al. (2013; e.g., 'Being a user / drinker is a central part of who I am', 'I identify with other users/ drinkers'). Internal consistency of this measure was good, Cronbach's $\alpha = 0.80$ at T1 and $\alpha = 0.87$ at T2, and the items were averaged to yield a single variable at each time point. Participants were asked to use the same 7-point Likert type scale (1 = *Do not agree* to 7 = *Agree completely*) to rate their agreement with items from each identity measure.

6.2.4 *Social identity differentiation* was calculated by subtracting the user identity score (T2) from the recovery identity score (T2) for each participant. A higher score indicated a stronger recovery identity than a user identity. This is the same as Buckingham and colleagues' (2013) identity preference measure.

6.2.5 *Commitment to Sobriety Scale* (Kelly & Greene, 2014) is a 5-item measure of participants' commitment to abstinence from substance use. An example item is 'I am totally committed to staying off alcohol/drugs'. Respondents are asked to rate their agreement with each statement on a 6-point scale from 1 = *Strongly disagree* to 6 = *Strongly agree*. Item scores are summed to produce a total score in the range of 5 to 30. Cronbach's alpha for the scale was good ($\alpha = .90$ at both T1 and T2).

6.2.6 *Kessler-10* (Kessler et al., 2002). This measure of psychological distress consists of 10 items, such as 'During the past 30 days, how often did you feel nervous?', which respondents are asked to rate on a 5-point scale from 1 = *None of the time* to 5 = *All of the time*. Item ratings are summed to give a total score in the range of 10 to 50, with scores over 20 being indicative of

psychological disorder. In this study, Cronbach's alpha for the scale was strong ($\alpha = .91$ at T1 and $.93$ at T2).

6.2.7 Personal Wellbeing scale. Personal wellbeing was measured using a single item from the Australian Treatment Outcomes Profile (Ryan et al., 2014): 'Thinking about your own life and circumstances, the past four weeks, how satisfied are you with your life as a whole?' on the scale from 0 = *Completely Dissatisfied* to 10 = *Completely Satisfied*.

6.3 Procedure

After consenting to participate in the study, participants completed the above measures as part of a larger interview battery, which lasted 60 to 90 minutes. All baseline (T1) interviews were conducted in person, while follow-up interviews (T2) were completed either by telephone or in person depending on the participant's availability. On completion, participants were debriefed and reimbursed with an AU\$30 store voucher at T1 and \$45 at T2 for their time. Ethical approval for the study was provided by the Monash University Human Research Ethics Committee, the University of QLD Human Research Ethics Committee, and the (Victorian) Eastern Health Human Research Ethics Committee. Further details of the study protocol are described in Best, Haslam, et al., (2016).

6.4 Analysis strategy

Robust regression analyses were used to examine the effect of substance user identity and recovery identity at baseline, and identity differentiation at six months, on the three outcome variables at follow-up: commitment to sobriety, personal wellbeing, and psychological distress. Robust hierarchical regression analyses were conducted because the distributions of the dependent variables were strongly skewed. Three models were run for each outcome. In the first

model, the outcome variable was regressed on demographic variables and other substance and treatment specific variables; in the second model, user and recovery identity at baseline were added as explanatory variables; in the third model, the recovery-user identity difference at T2 was added. All continuous variables were standardized prior to being entered into the models. Among the 307 participants, 136 (44% of the original sample; 33% due to attrition) either had missing data in at least one of the analysis variables. Multiple imputation (Rubin, 2009) based on all analysis variables using the iterated chained equation approach was used to fill in missing values, and the analyses were based on ten twenty imputed datasets. A simulation study has demonstrated that the estimation performance using 20 imputations in a scenario similar to ours was good (Graham et al., 2007). A series of supplementary analyses were performed to evaluate the robustness of the results. First, we repeated the analyses with only complete cases to evaluate the impact of missing data on the results. Second, we repeated the analyses with log-transformed variables using traditional multiple regression. All analyses and imputation were performed using STATA 14 (StataCorp, 2016).

7. Results

Table 1 shows descriptive statistics for all variables in the study. The average length of stay in the TC was 126 days ($SD = 91$). At the T2 assessment, 40.3% of the participants were still in the TC while the majority (59.7%) had left. At T1, the sample mean for user identity was 5.32 and the mean for recovery identity was 5.39 (out of 7). Six months later (T2), the mean user identity had decreased to 3.92 while the mean recovery identity remained high at 5.41 (see Table 1). Table 2 shows substance user identification and recovery identification for the sample broken down by primary drug of concern. Contrary to H2, there was no difference between participants whose primary drug of concern was alcohol, amphetamine type stimulants, or other drugs, in

user or recovery identification at either T1 or T2. By extension, social identity differentiation at T2 did not differ across the primary drug of concern categories, refuting hypothesis 2.

Subsequent analyses were therefore conducted on data from the full sample.

<INSERT TABLES 1 AND 2 ABOUT HERE>

Table 3 shows the bivariate correlations between variables. Participant sex and age were not related to any identity or outcome variables. User identity (T1) was correlated with days use of primary drug of concern over the 30 days prior to admission ($r = 0.2, p < .001$) and lower commitment to sobriety at T2 ($r = -0.20, p < .001$). Recovery identity (T1) was correlated with commitment to sobriety at T2 ($r = 0.26, p < .001$), and personal wellbeing at T2 ($r = 0.2, p < .01$). The difference between user and recovery identity at T2 was significantly correlated with commitment to sobriety ($r = 0.59$), personal wellbeing ($r = 0.51$) and inversely related to K10 psychological distress ($r = -0.50$), all $p < .001$.

<INSERT TABLE 3 ABOUT HERE>

Table 4 shows the percentage of variance explained in each outcome variable in our robust regression models. At step 1, none of the demographic and treatment specific variables were significantly associated with any outcome variables ($p > .05$). In step 2, user and recovery identity measured at admission were added into the models. User identity was associated with lower commitment to sobriety, $\beta = -0.19, p = .008$ and not associated with personal wellbeing, $\beta = -0.08, p = .258$, or psychological distress, $\beta = 0.10, p = .139$. Recovery identity was associated with higher commitment to sobriety, $\beta = 0.26, p < .001$, and personal wellbeing, $\beta = 0.21, p = .004$, but not with psychological distress, $\beta = -0.10, p = .181$. The step 3 figures indicate that 36% of the variance in commitment to sobriety was explained by the full model, of

which 25% variance was explained by the identity differentiation term added in step 3 (i.e. 36% in step 3 minus 11% accounted for in step 2 by the variables already in the model). Similarly, 20% of the variance in personal wellbeing was explained by the identity differentiation term (27% minus 7%), and 23% of variance in K10 distress scores was explained by the identity differentiation term (28% minus 5%; see Table 4).

<INSERT TABLE 4 ABOUT HERE>

Table 5 shows the regression coefficients and the associated 95% confidence intervals for the three outcome variables in the final models (Step 3). Recovery-user identity difference at follow-up was significantly associated with higher commitment to sobriety, $\beta = 0.53, p < .001$, higher personal wellbeing, $\beta = 0.51, p < .001$, and lower psychological distress, $\beta = -0.54, p < .001$. After adding the recovery-user identity difference, only recovery identity at admission was significantly associated with one outcome measure; commitment to sobriety, $\beta = .15, p = .013$. Results based on complete cases analyses and traditional multiple regressions with transformed variables were similar to the above results, and the same conclusions about the impact of the recovery-user identity difference on the three outcomes were reached. Therefore, missing data and skewness in the variables were unlikely to have substantial impact on the analyses' results.

<INSERT TABLE 5 ABOUT HERE>

8. Discussion

This study builds on previous research on the role of user and recovery social identities in addiction recovery by examining a large sample of people recruited from five therapeutic communities and analysing social identities in relation to participants' primary drug of concern. Participants strongly endorsed both substance user and recovery identities as they entered

treatment in the therapeutic community, with no significant difference between these identities. Confirming our first hypothesis, the relative strength of the two social identities diverged at six months such that user identity was weaker while recovery identity remained strong. Social identity differentiation measured six months after entry to the therapeutic community predicted participants' commitment to sobriety, personal wellbeing, and was inversely related to psychological distress; accounting for between a fifth and a quarter of the variance in each outcome measure. This was after accounting for addiction severity, primary drug category, and T1 identity ratings in the model. This means that those who saw themselves more strongly as belonging to recovery groups and communities than as belonging to substance using groups were psychologically healthier and remained more highly committed to their recovery goal (sobriety).

This finding is consistent with results from earlier research in AA/NA group members and quitting smokers (Buckingham et al., 2013) and a previous study of adults in TC treatment (Dingle et al., 2015). In Buckingham's study, the greater the perceived difference between evaluations of "addict" and "recovering addict" identities, the less likely an individual was to retrospectively report relapse in the last month, 1 year, and 2 years; and Pearson's correlations were in the order of -.3 across the various substance related outcomes among AA/NA members. The 20% variance in personal wellbeing and 23% variance in psychological distress accounted for by identity differentiation in the current study is lower than the 49% variance in life satisfaction found in the Dingle et al (2015) study, although these are somewhat different constructs. The life satisfaction measure by Diener and colleagues (1985) used in Dingle et al (2015) comprised items like '*So far I have gotten the important things I want in life*', which are very broad and not time constrained, whereas, the wellbeing measures used in the current study were confined to the past four weeks, and the K10 focused on specific symptoms of anxiety and

depression rather than broad areas of life. Further, the timing of measurement in Dingle et al. (2015) was around seven months after participants left the TC – which allowed more time for participants of that study to reintegrate into their communities and potentially to find satisfaction in broader aspects of their lives.

Commitment to sobriety has not been examined before in the context of social identity differentiation and it is interpreted here as a positive indicator of longer-term substance use outcomes (Kelly & Greene, 2014). Whether the extent of social identity differentiation among participants in the current sample predicts their actual substance use outcomes following treatment will be examined in a future paper using data from three waves. The finding that the extent of participants' social identity differentiation was related to their commitment to sobriety is consistent with the norm enactment hypothesis from the social identity approach (see Haslam, et al., 2018). This makes sense, as these individuals should be more motivated to embrace norms that support recovery (e.g., to abstain from use of addictive substances) and therefore, they should also be more like to behave in manner that accords with those norms (e.g., seeking support when at risk of relapse). Similar relationships between group identification and commitment to the group and its values have been found in organisational groups (Ellemers, Spears, & Doosje, 1997) and exercise groups (Stevens, Rees, & Polman, 2018).

Contrary to our second hypothesis that that there would be a relationship between primary substance of concern and identity differentiation during TC treatment, the results indicated similar endorsement of both user and recovery identities among the alcohol, amphetamine type stimulants, and other primary drugs categories. This lack of substance group differences was true at both entry to the TC and six months later. Across the whole sample, recovery identity remained high from T1 to T2, while user identity decreased in strength from T1

to T2, reflecting a differentiation between social identities during treatment. This finding means that the way a person uses a substance and the social and legal context of the substance use does not appear to influence how readily they can relinquish their user identity and adopt a recovery identity. This is useful to know, given the growing proportion of methamphetamine users seeking TC treatment (Best, Haslam, et al., 2016) and current lack of effective pharmacotherapeutic options for this population (see Lee, Jenner, Harney & Cameron, 2018, for a review). Possible explanations for this lack of differentiation between primary substance categories are first, that the TC programs themselves do not differentiate between primary substance categories; instead, a common program was offered to all residents regardless of their substance use history. Secondly, primary substance of concern was typically not the only substance of concern, with most participants reporting use of more than one substance.

It is important to note that substance related identities – while salient to people entering treatment – are not the only social identities that influence their health and wellbeing. Other social identities like occupational, educational, and family role identities have been shown to play a role in recovery from addiction (see Dingle, Cruwys, & Frings, 2015 for examples – more on this below). It may be that people who have more alternative social identities available find it easier to relinquish their user identity in favour of a recovery identity. For instance, in their study of mothers recovering from addiction, Gunn and Samuels (2019) stated that the development of a recovery identity is dynamically shaped by other identities (e.g., mother, woman) and embedded in relationship networks. However further research is required to determine whether there is any relationship between the problematic use of different substances and potential influence on substance related or broader social identities. Future research along these lines might involve social identity mapping (Cruwys, et al., 2016), a procedure which allows participants to visually

represent their social group memberships and networks along with ratings of various group-based resources such as social support, and group-based risks such as heavy substance use (see Beckwith, et al., 2019; Haslam et al., 2017).

The findings of this study validate the core premise of the Social Identity Model of Recovery (SIMOR; Best, Beckwith, et al., 2016) that depicts addiction recovery as a process of social identity negotiation involving a change in the strength of particular social identities in predicting recovery outcomes. Indeed, TC treatment offers a showcase for understanding group factors in addiction treatment because they are long stay residential services that involve a range of small and large group therapy sessions within a community. In contrast to hospital and outpatient alcohol and drug treatment services, which may be delivered predominantly in individual sessions, therapeutic communities rely strongly on social interactions among residents and staff as a key agent of change. Known as the “community-as-method” approach to rehabilitation, this has been described as “teaching individuals to use the context of community life to learn about themselves” (De Leon, 2000, p. 93) and recognises the influence of peer and staff relationships, social roles, social structure, group process and daily activities (Vanderplasschen, Yates, & Miovisky, 2017). Because TC treatment programs typically last three to six months, the therapeutic community provides a good context in which to study the potential contributions of social factors to outcomes. Further interrogation of individuals’ wider group composition (from more substance-using groups at the start of recovery to more recovery and non-using groups in late recovery and a concomitant shift in the salience of ‘user’ and ‘recovery’ social identities over the course of treatment) would be useful in future TC based research.

A caveat here is that this pattern of user – recovery identity differentiation does not emerge in all samples and contexts. For instance, in the Australian Pathways to Recovery

project, participants reported a reduction in the proportion of their social network comprised of substance users along with an increase in the proportion of their social network that was comprised of other people in recovery from T1 ‘at the peak of active addiction’ to T2 ‘in recovery’ (Bathish et al., 2017). This change in social network composition was associated with wellbeing at T2, however, the difference between recovery identity and user identity at T2 was not a significant predictor in the model. Indeed, identity differentiation *decreased* over time, with affiliation with substance users remaining high between T1 and T2 and affiliation with people in recovery significantly increasing from low affiliation at T1 to high affiliation at T2 (Bathish, et al., 2017). The AA context appears to promote an integration of user and recovery identities in the form of a “recovering addict”, promoting the idea that recovery and addict aspects of the identity play an equal role in people’s lives in terms of sustainable recovery. In promoting an active addict identity down the track, the differentiation measure loses its predictive power. But arguably when there is reconciliation of these identities the differentiation is no longer meaningful. The inconsistent findings also highlight the importance of timing of assessments: social identity differentiation may be an effective indicator of outcomes early in treatment/recovery and less so later in the recovery process.

One possible explanation for the inconsistent findings of the current study and the Pathways to Recovery project findings (Bathish et al., 2017) is that stigmatised groups can still be supportive and thus associated with participant wellbeing (e.g., Jetten, Haslam, Cruwys, & Branscombe, 2018). Another possible explanation is that participants in the natural recovery group also appeared to be more likely to belong to multiple groups in recovery than people in other recovery pathways were. In the social identity literature, multiple group belonging is considered an asset, as it provides people with numerous sources of support and identities they

can draw on, especially in times of difficulty or transition (Jetten, Haslam, & Haslam, 2012). Multiple groups can also provide numerous types of support – for example, financial, emotional and practical – such that the individual is more likely to get effective help when facing a specific challenge. The potential role of broader social group memberships (such as family, friends, occupational and recreational groups) in addiction recovery has been noted in previous studies (e.g., Dingle, Cruwys, & Frings, 2015; Williams, Dingle, Jetten, & Rowan, 2019), and is an avenue for further research.

8.1 Limitations

There were some limitations with the current study, such as the fact that forty percent of the participants were still in a TC at six months, while sixty percent had left. Context is known to influence endorsement of social identities (Lau, 1989) and also likely to influence participants' exposure to substances and substance related cues (which are salient in the general community but absent in the TC setting). Second, the five TCs involved in this study varied somewhat in the structure, content and duration of their therapeutic programs, and in factors such as whether family members could reside in the TC. The extent to which such factors may influence social identity differentiation is currently unknown and requires more in-depth research.

Identity differentiation, while explaining a proportion of variance in addiction treatment outcomes, is a construct that can be further refined. In this study, we have assumed that the extent of identity differentiation six months after TC admission was primarily determined by the participants' sense of belonging to the TC and the substance-related norms and attitudes learned from other members of the recovery ingroup while in TC treatment. However, it is unclear from these findings, if other social variables such as recovery group size and complexity, contact with multiple sources from the ingroup, and frequency of contact with diverse recovery groups might

influence the extent of identity differentiation and in turn, outcomes. It is also unclear whether our measure of recovery identification assessed identification with the TC specifically or broader social identification with the TC and other recovery supportive groups such as AA, NA, and other non-substance-using social groups. In extending research on identity differentiation, this work could look to incorporate some social network theory and methods (see Valente & Pitts, 2017); in particular, the number of connections in the recovery groups, the compatibility between recovery groups, and the strength of emotional attachments to each group. Indeed, there is evidence showing that both group capital (number of important groups) and group identification are predictive of outcomes in a range of health contexts including mortality rates after retirement (Steffens et al., 2016); relapse into depression (Cruwys, et al., 2013), and cognitive decline in older adults (e.g., Haslam, et al., 2014). We recognise that both social capital and social identity constructs may play a role and should be considered in future research.

Another limitation was that the categorisation of participants for our second hypothesis was based on their self-reported primary drug of concern. However, these were not mutually exclusive categories, with many participants using more than one substance. It would take a much larger sample to allow for sufficient numbers of 'sole' substance users in each category, however, this approach would more clearly test the hypothesis in relation to identity differentiation according to primary substance.

8.2 Conclusion

The current study found that while participants endorsed a substance user identity and a recovery identity equally upon admission to a therapeutic community, there was a significant differentiation between these identities after six months. Although identity differentiation was

not affected by the participants' primary substance of concern, it accounted for around a quarter of the variance in interim outcomes (i.e., commitment to sobriety, wellbeing, and psychological distress); a finding consistent with previous studies in other treatment settings (such as a quit smoking online community, and members of mutual support groups). The timing and context of social identity assessments appears to be important in determining their usefulness as a predictor of recovery outcomes.

References

- Bathish, R., Best, D., Savic, M., Beckwith, M., Mackenzie, J., & Lubman, D. I. (2017). "Is it me or should my friends take the credit?" The role of social networks and social identity in recovery from addiction. *Journal of Applied Social Psychology, 47*, 35–46. doi: 10.1111/jasp.12420
- Beckwith, M., Best, D., Dingle, G., Perryman, C., & Lubman, D. (2015). Predictors of flexibility in social identity among people entering a therapeutic community for substance abuse. *Alcoholism Treatment Quarterly, 33*(1), 93-104. doi: 10.1080/07347324.2015.982465
- Beckwith, M., Best, D., Savic, M., Haslam, C., Bathish, R., Dingle, G. A., Mackenzie, J., Staiger, P. K., & Lubman, D. I. (2019). Social Identity Mapping in Recovery (SIM-R): Development and application of a visual method. *Addiction Research & Theory*, accepted in press. doi: 10.1080/16066359.2018.1544623
- Berkman, L. F., Glass, T., Brissette, I., & Seeman, T. E., (2000). From social integration to health: Durkheim in the new millennium. *Social Science & Medicine, 51*(6), 843-857. doi: 10.1016/S0277-9536(00)00065-4
- Best, D., Beckwith, M., Haslam, C., Haslam, S. A., Jetten, J., Mawson, E., & Lubman, D. I. (2016). Overcoming alcohol and other drug addiction as a process of social identity transition: The social identity model of recovery (SIMOR). *Addiction Research & Theory, 24*(2), 111-123. doi: 10.3109/16066359.2015.1075980
- Best, D., Haslam, C., Staiger, P., Dingle, G., Savic, M., Bathish, R., Alexander, J., Beckwith, M., & Lubman, D. I. (2016). Social Networks and Recovery (SONAR): Characteristics of a

longitudinal outcome study in five Therapeutic Communities in Australia. *Therapeutic Communities*, 37(3), 131-139. doi: 10.1108/TC-04-2016-0012

Buckingham, S. A., & Best, D. (2017). *Addiction, Behavioral Change and Social Identity: The path to resilience and recovery*. London; New York: Routledge. ISBN: 978-1-13-893408-5

Buckingham, S. A., Frings, D., & Albery, I. P. (2013). Group membership and social identity in addiction recovery. *Psychology of Addictive Behaviors*, 27(4), 1132-1140. doi: 10.1037/a0032480

Cameron, J. E., Voth, J., Jaglal, S. B., Guilcher, S. J. T., Hawker, G., & Salbach, N. M. (2018). “In this together”: Social identification predicts health outcomes (via self-efficacy) in a chronic disease self-management program. *Social Science & Medicine*, 208, 172-179. doi: 10.1016/j.socscimed.2018.03.007

Cruwys, T., Dingle, G. A., Haslam, C., Haslam, A. S., Jetten, J. & Morton, T. (2013). Social group memberships alleviate depression symptoms, prevent depression relapse, and protect against future depression. *Social Science and Medicine*, 98, 179-186. doi: 10.1016/j.socscimed.2013.09.013

Cruwys, T. L., Haslam, S. A., Dingle, G. A., Jetten, J., Hornsey, M. J., Chong, E. M. D., & Oei, T. P. S. (2014). Feeling connected again: Interventions that increase social identification reduce depression symptoms in community and clinical settings. *Journal of Affective Disorders*, 159, 139–146. doi: 10.1016/j.jad.2014.02.019

Cruwys, T., Steffens, N. K., Haslam, S. A., Haslam, C., Jetten, J. & Dingle, G. A. (2016). Social Identity Mapping: A procedure for visual representation and assessment of subjective

- multiple group memberships. *British Journal of Social Psychology*, 55(4), 613-642. doi: 10.1111/bjso.12155
- DeLeon, G. (2013). Therapeutic Communities. Chapter 66 in P. M. Miller (Editor). *Interventions for Addiction – Comprehensive Addictive Behaviors and Disorders*. San Diego, U.S.A: Academic Press. pp. 643-654. ISBN: 9780123983381
- Dingle, G. A., Cruwys, T., & Frings, D. (2015). Social identities as pathways into and out of addiction. *Frontiers in Psychology*, 6: 1795. doi: 10.3389/fpsyg.2015.0179510.1111/asap.12089
- Dingle, G., Stark, C., Cruwys, T., & Best, D. (2015). Breaking good: Breaking ties with social groups may be good for recovery from substance misuse. *British Journal of Social Psychology*, 54(2), 236-54. doi: 10.1111/bjso.12081
- Doosje, B., Ellemers, N., & Spears, R. (1995). Perceived intragroup variability as a function of group status and identification. *Journal of Experimental Social Psychology*, 31, 410–436. doi:10.1006/jesp.1995.1018
- Ellemers, N., Spears, R., & Doosje, B. (1997). Sticking together or falling apart: In-group identification as a psychological determinant of group commitment versus individual mobility. *Journal of Personality & Social Psychology*, 72(3), 617–626.
- Frings, D., Collins, M., Long, G., Pinto, I. R., & Albery, I. P. (2016). A test of the Social Identity Model of Cessation Maintenance: The content and role of social control. *Addictive Behaviors Reports*, 3, 77-85. doi: 10.1016/j.abrep.2016.02.003

- Fujimoto, K., & Valente, T. W. (2015). Multiplex congruity: Friendship networks and perceived popularity as correlates of adolescent alcohol use. *Social Science & Medicine*, *125*, 173-181. doi: 10.1016/j.socscimed.2014.05.023
- Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of multiple imputation theory. *Prevention Science*, *8*(3), 206-213.
- Granfield, R., & Cloud, W. (1999). *Coming Clean: Overcoming addiction without treatment*. New York University Press, New York. ISBN: 9780814715826
- Gunn, A., & Samuels, G. M. (2019). Promoting recovery identities among mothers with histories of addiction: Strategies of family engagement. *Family Process*, *in press*. doi: 10.1111/famp.12413
- Haslam, C., Cruwys, T., & Haslam, S. A. (2014). “The we’s have it”: evidence for the distinctive benefits of group engagement in enhancing cognitive health in aging. *Social Science & Medicine*, *120*, 57–66. doi: 10.1016/j.socscimed.2014.08.037
- Haslam, C., Dingle, G., Best, D., Mackenzie, J., & Beckwith, M. (2017). Social Identity Mapping: Measuring social identity change in recovery from addiction. Chapter 10 in S.A. Buckingham and D. Best (Eds.) *Addiction, Behavioural Change and Social Identity – The path to resilience and recovery*. Routledge. ISBN: 978-1-13-893408-5
- Haslam, C., Jetten, J., Cruwys, T., Dingle, G., & Haslam, S. A. (2018). *The New Psychology of Health: Unlocking the Social Cure*. London: Routledge. ISBN: 978-1138123885

- Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Medicine*, 7, 2-20. doi: 10.1371/journal.pmed.1000316
- Jetten, J., Haslam, C., Haslam, S. A., Dingle, G. A., & Jones, J. (2014) How groups affect our health and wellbeing: The path from theory to policy. *Social Issues and Policy Review*, 8 (1): 102-128.
- Jetten, J., Haslam, C., & Haslam, A. S. (Eds) (2012). *The Social Cure: Identity, Health and Well-Being*. Hove; New York: Psychology Press. ISBN 9781848720213
- Jetten, J., Haslam, S. A., Cruwys, T., & Branscombe, N. R. (2018). Social identity, stigma, and health. In B. Major, J. F. Dovidio, & B. G. Link (Eds.), *Oxford library of psychology. The Oxford handbook of stigma, discrimination, and health* (pp. 301-316). New York, NY, US: Oxford University Press. ISBN: 9780190243470
- Kelly, J. F., & Greene, M. C. (2014). Beyond motivation: Initial validation of the commitment to sobriety scale. *Journal of Substance Abuse Treatment*, 46 (2), 257-63. doi: 10.1016/j.jsat.2013.06.010.
- Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L., et al. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine*, 32, 959-976. doi: 10.1017/S0033291702006074
- Kulesza, M., Larimer, M. E., & Rao, D. (2013). Substance use related stigma: What we know and the way forward. *Addictive Behaviors and Therapeutic Rehabilitation*, 2(2), 782. doi: 10.4172/2324-9005.1000106

- Lau, R. R. (1989). Individual and contextual influences on group identification. *Social Psychology Quarterly*, 52(3), 220-231. doi: 10.2307/2786717
- Lee, N. K., Jenner, L., Harney, A., & Cameron, J. (2018). Pharmacotherapy for amphetamine dependence: A systematic review. *Drug and Alcohol Dependence*, 191, 309-337. doi: 10.1016/j.drugalcdep.2018.06.038
- Litt, M. D., Kadden, R. M., Tennen, H., & Kabela-Cormier, E. (2016). Network Support II: Randomized controlled trial of network support treatment and cognitive behavioral therapy for alcohol use disorder. *Drug and Alcohol Dependence*, 165, 203–212. doi: 10.1016/j.drugalcdep.2016.06.010
- Longabaugh, R., Wirtz, P. W., Zywiak, W. H., & O'Malley, S. (2010). Network support as a prognostic indicator of drinking outcomes: The COMBINE Study. *Journal of Studies on Alcohol and Drugs*, 71, 837-846.
- Meijer, E., Van den Putte, B., Gebhardt, W. A., Van Laar, C., Bakk, Z., Dijkstra, A., Fong, H., West, R., & Willemsen, M. A. (2018). A longitudinal study into the reciprocal effects of identities and smoking behaviour: Findings from the ITC Netherlands Survey. *Social Science & Medicine*, 200, 249–257. doi: 10.1016/j.socscimed.2017.12.006
- Mercken, L., Snijders, T. A. B., Steglich, C., & de Vries, H. (2009). Dynamics of adolescent friendship networks and smoking behavior: Social network analyses in six European countries. *Social Science & Medicine*, 69(10), 1506-1514. doi: 10.1016/j.socscimed.2009.08.003

- Perry, B. L., & Percosolido, B. A. (2015). Social network activation: The role of health discussion partners in recovery from mental illness. *Social Science & Medicine*, *125*, 116-128. doi: 10.1016/j.socscimed.2013.12.033
- Rees, C., & Wallace, D. (2014). The myth of conformity: Adolescents and abstention from unhealthy drinking behaviors. *Social Science & Medicine*, *108*, 34-45. doi: 10.1016/j.socscimed.2014.01.040
- Rubin, D. B. (2009). *Multiple imputation for nonresponse in surveys*. New York: John Wiley & Sons. ISBN:9780471087052
- Ryan, A., Holmes, J., Hunt, V., Dunlop, A., Mammen, K., & Holland, R., ... Lintzeris, N. (2014). Validation and implementation of the Australian treatment outcomes profile in specialist drug and alcohol settings. *Drug and Alcohol Review*, *33*, 3342. Doi: 10.1111/dar.12083
- StataCorp. (2016). *Stata Statistical Software: Release 14.*: College Station, TX: StataCorp LP.
- Steffens, N. K., Cruwys, T., Haslam, C., Jetten, J., & Haslam, S. A. (2016). Social group memberships in retirement are associated with reduced risk of premature death: evidence from a longitudinal cohort study. *BMJ Open*, *6*:e010164. doi: 10.1136/bmjopen-2015-010164
- Stevens, M., Rees, T., & Polman, R. (2018). Social identification, exercise participation, and positive exercise experiences: Evidence from parkrun. *Journal of Sports Sciences*, *37*(2), 221-228. doi: 10.1080/02640414.2018.1489360

- Stout, R. L., Kelly, J. F., Magill, M., & Pagano, M. E. (2012). Association between social influences and drinking outcomes across three years. *Journal of Studies on Alcohol and Drugs*, 73, 489 – 497.
- Tajfel, H. & Turner, J. C. (1979). An integrative theory of intergroup conflict. In: W.G. Austin and S. Worehel (Eds). *The Social Psychology of Intergroup Relations*. Monterey: Brooks/Cole, pp. 33-47.
- Tsai, A. C., & Papachristos, A. V. (2015). From social networks to health: Durkheim after the turn of the millennium. *Social Science & Medicine*, 125, 1-7. doi: 10.1016/j.socscimed.2014.10.045
- Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D. & Wetherell, M. S. (1987) *Rediscovering the Social Group: A Self-Categorization Theory*. Oxford: Blackwell.
- UK Drug Policy Commission. (2008). The UK drug policy commission recovery consensus group: a vision of recovery. London: UK Drug Policy Commission.
- Valente, T. W., & Pitts, S. R. (2017). An appraisal of social network theory and analysis as applied to public health: Challenges and opportunities. *Annual Review of Public Health*, 38, 103–118. doi: 10.1146/annurev-publhealth-031816-044528
- Vanderplasschen, W., Yates, R., & Miovský, M. (2017). Bridging the gap between research and practice in Therapeutic Communities (TCs) for addictions. *Journal of Groups in Addiction & Recovery*, 12(2-3), 63-67. doi: 10.1080/1556035X.2017.1331598
- Williams, E., Dingle, G. A., Jetten, J., & Rowan, C. (2019). Identification with arts-based groups improves mental wellbeing in adults with chronic mental health conditions. *Journal of Applied Social Psychology*, 49(1), 15-26. doi: 10.1111/jasp.12561

Table 1.

Descriptive statistics for the key variables from the 307 participants

| Time 1 | <i>N</i> | <i>M</i> | <i>SD</i> |
|--------------------------------------------|----------|----------|-----------|
| Days use of primary drug (past 30 days) | 288 | 18.93 | 10.61 |
| Number of previous TC treatment admissions | 286 | 0.58 | 1.03 |
| User identity | 307 | 5.32 | 1.48 |
| Recovery identity | 307 | 5.39 | 1.13 |
| Commitment to Sobriety | 305 | 26.08 | 4.47 |
| Personal wellbeing | 306 | 34.80 | 24.84 |
| K10 - Psychological distress | 305 | 28.67 | 8.41 |
| Time 2 | | | |
| Commitment to Sobriety | 205 | 25.41 | 4.94 |
| Personal wellbeing | 205 | 58.00 | 25.45 |
| K10 - Psychological distress | 205 | 22.73 | 8.43 |
| User identity | 206 | 3.92 | 1.90 |
| Recovery identity | 206 | 5.41 | 1.39 |
| Recovery-User identity difference | 206 | 1.49 | 2.45 |
| Categorical variable | <i>N</i> | % | |
| Gender | | | |
| Male | 209 | 68.30 | |
| Female | 97 | 31.70 | |
| Primary drug of concern | | | |
| Alcohol | 101 | 32.90 | |
| ATS | 117 | 38.11 | |
| Other | 89 | 28.99 | |

TC = Therapeutic Community; ATS = Amphetamine type stimulants

Table 2.

User and recovery identity means at entry to the therapeutic community (T1) and six months later (T2) by primary drug of concern

| | Primary drug of concern | | | | | |
|-----------------------------------|-------------------------|-----------|----------------------------------------------|-----------|-----------------|-----------|
| | Alcohol (n =101) | | Amphetamine Type Stimulants (n=117) | | Other (n=89) | |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| User identity T1 | 5.32 | 1.45 | 5.22 | 1.57 | 5.45 | 1.39 |
| Recovery identity T1 | 5.39 | 1.03 | 5.45 | 1.14 | 5.30 | 1.21 |
| User identity T2 ^a | 4.00 | 1.96 | 3.70 | 1.96 | 4.17 | 1.99 |
| Recovery identity T2 ^a | 5.33 | 1.42 | 5.48 | 1.45 | 5.17 | 1.46 |

^aThe means and standard deviations at Time 2 were estimated based on the imputed dataset.

Table 3.

Correlation matrix of key analysis variables.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|----------------------------------|-------|-------|---------|-------|----------|---------|----------|----------|----------|
| (1) Gender ^a | 1.00 | | | | | | | | |
| (2) Age | 0.07 | 1.00 | | | | | | | |
| (3) Primary drug of concern | -0.02 | 0.12 | 1.00 | | | | | | |
| (4) Number TC admissions | -0.02 | 0.09 | 0.05 | 1.00 | | | | | |
| (5) User identity T1 | -0.01 | -0.04 | 0.20*** | -0.03 | 1.00 | | | | |
| (6) Recovery identity T1 | 0.07 | 0.10 | -0.05 | 0.05 | 0.02 | 1.00 | | | |
| (7) Commitment to sobriety T2 | 0.04 | 0.03 | 0.03 | 0.09 | -0.20*** | 0.26*** | 1.00 | | |
| (8) Personal Wellbeing T2 | 0.05 | 0.03 | -0.06 | 0.03 | -0.09 | 0.20** | 0.46*** | 1.00 | |
| (9) Psychological distress T2 | 0.09 | 0.03 | 0.01 | -0.03 | 0.06 | -0.09 | -0.40*** | -0.70*** | 1.00 |
| (10) Identity differentiation T2 | 0.03 | -0.01 | -0.01 | 0.07 | -0.28*** | 0.27*** | 0.59*** | 0.51*** | -0.50*** |

^a Gender was coded as 1: Male and 2: Female. *** $p < .001$; ** $p < .01$; * $p < .05$

Table 4.

Model R^2 .

| | Commitment to Sobriety | Personal wellbeing | K10 Psychological distress |
|---------------------|---------------------------|--------------------|----------------------------------|
| Step 1 ^a | 0.02 | 0.02 | 0.03 |
| Step 2 ^b | 0.11 | 0.07 | 0.05 |
| Step 3 ^c | 0.36 | 0.27 | 0.28 |

Table 5. Results from robust regression analyses to predict commitment to sobriety, personal wellbeing, and K10 psychological distress, based on ten multiply imputed datasets.

| | Commitment to Sobriety | | Personal wellbeing | | K10 - Psychological distress | |
|---------------------------------------------------------------------------------|------------------------|---------------|--------------------|---------------|------------------------------|----------------|
| | β | 95% CI | β | 95% CI | β | 95% CI |
| Female | 0.00 | (-0.23, 0.24) | 0.04 | (-0.26, 0.35) | 0.29* | (0.02, 0.57) |
| Age | -0.00 | (-0.10, 0.11) | 0.05 | (-0.08, 0.17) | 0.01 | (-0.11, 0.14) |
| Primary drug of concern (Ref: Alcohol) | | | | | | |
| ATS | -0.00 | (-0.30, 0.30) | 0.06 | (-0.26, 0.39) | 0.04 | (-0.26, 0.35) |
| Other | 0.07 | (-0.22, 0.36) | 0.01 | (-0.27, 0.29) | 0.02 | (-0.29, 0.32) |
| Use of primary drug of concern (Days of use in the month prior to treatment) | | | | | | |
| | 0.07 | (-0.06, 0.19) | -0.02 | (-0.16, 0.11) | -0.02 | (-0.16, 0.13) |
| Number of treatment admissions | 0.04 | (-0.06, 0.15) | 0.02 | (-0.10, 0.14) | -0.01 | (-0.13, 0.11) |
| Substance user identity | -0.05 | (-0.18, 0.08) | 0.05 | (-0.07, 0.18) | -0.05 | (-0.18, 0.08) |
| Recovery identity | 0.15** | (0.03, 0.26) | 0.06 | (-0.06, 0.20) | 0.03 | (-0.10, 0.17) |
| Recovery-user identity difference at follow-up | | | | | | |
| | 0.53*** | (0.40, 0.67) | 0.51*** | (0.36, 0.65) | -0.54*** | (-0.67, -0.41) |

*** $p < .001$; ** $p < .01$; * $p < .05$.

