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# Associations between social identity diversity, compatibility, and recovery capital amongst young people in substance use treatment



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## ABSTRACT

This study explored associations between group memberships and recovery capital amongst 20 young adults aged 18 to 21 years in residential alcohol and drug treatment.

**Method:** Participants completed an interviewer administered research interview based on measures of recovery capital and a social networks assessment mapping group memberships, group substance use, and relationships between groups.

**Results:** Higher personal and social recovery capital was associated with lower diversity of group memberships, a higher number of positive links between groups, and greater compatibility of lower substance-using groups with other groups in the network. Higher compatibility of heavier-using groups was also associated with having a higher number of negative, antagonistic ties between groups.

**Conclusions:** These findings indicate that it is higher compatibility of a lower substance-using social identity and lower-using group memberships that contributes to recovery capital. Further, positive ties between groups and lower diversity of group memberships appear to be key aspects in how multiple social identities that are held by young adults relate to personal and social recovery capital.

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## 1. Introduction

Using a strengths-based approach, the construct of Recovery Capital considers the range of personal and social resources available to individuals at all stages of the pathway to wellbeing (Cloud & Granfield, 2001, 2008). Recovery capital is present to greater or lesser degrees in all people, and has relevance at all stages of recovery (Laudet & White, 2008; White & Cloud, 2008). Conceptually, recovery capital is drawn from personal attributes of the self (e.g., Personal recovery capital) and from attributes of the person's social environment (e.g., Social recovery capital). In the Assessment of Recovery Capital scale (Groshkova, Best, & White, 2013), personal recovery capital includes capacity for resilience when faced with challenges to recovery, coping with challenges of everyday life, and physical and psychological health. In contrast, social recovery capital emerges from social resources that can be used to support recovery goals, including social support, meaningful relations and a feeling of belonging, and social network support for recovery (Groshkova et al., 2013).

In line with the conceptual importance of social networks for social recovery capital, the addition of non-using and recovery peers and increases in the proportion of non-users in the network has been linked with improved treatment outcomes and reduced relapse risk from 1 to 10 years following treatment (Litt, Kadden, Kabela-Cormier, & Petry, 2009; Litt, Kadden, Tennen, & Kabela-Cormier, 2016; Longabaugh, Wirtz, Zweben, & Stout, 1998). Research into the mechanisms underlying social network effects in recovery suggest that social support specific to recovery (Longabaugh, Wirtz, Zywiak, & O'Malley, 2010; Longabaugh et al., 1998), and social reinforcement of the 'recovery identity' (Johansen, Brendryen, Darnell, & Wennesland, 2013; Kellogg, 1993; Radcliffe, 2011) provide meaning, hope and social validation of recovery. Further, social learning and modelling of recovery coping by others in recovery (Bandura, 2004), communication of norms favouring lower use, and sanctions for relapse (i.e. social control processes; Moos, 2008, 2011) provide the context in which recovery is learned alongside communication of social costs risked by a return to substance use.

More recently, the Social Identity Model of Recovery (SIMOR; Best et al., 2016) and the Social Identity Model of Cessation Maintenance (SIMCM; Frings & Albery, 2015) have drawn on Social Identity Theory (Tajfel & Turner, 1979) and Self-Categorisation Theories (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) to propose that membership

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of groups formed around recovery - and perception of the self as a member of these groups - is key to accessing the benefits of social support for recovery. Crucially, the perceived relevance of social support is influenced by whether that support is seen as originating from one's own group members (Jones & Jetten, 2011; Vik, Grizzle, & Brown, 1992). Accordingly, both SIMOR and SIMCM propose that when a person in recovery is connected to a group that is defined by a shared experience of recovery - *and when the person is highly identified with and defined by this group membership* - then the support and resources provided by the recovery group will be more likely to guide responses to situations that may trigger relapse.

SIMOR builds on the earlier Social Identity Model of Identity Change (SIMIC), which proposes that life changes force change in identity that occurs alongside and through changes in social group memberships (Jetten & Pachana, 2012). Starting with the observation that most individuals hold multiple social identities (Deaux, Reid, Mizrahi, & Ethier, 1995) SIMIC proposes group memberships provide identity resources, with more group memberships providing a richer sense of self that is less vulnerable to the loss of any one group membership resulting from significant life change and reorientation of social connections (C. Haslam et al., 2008; Iyer & Jetten, 2011; Iyer, Jetten, Tsivrikos, Postmes, & Haslam, 2009; Jetten & Pachana, 2012). In SIMOR, the social identity model of identity change is adjusted to acknowledge that not all group memberships benefit health (Oyserman, Fryberg, & Yoder, 2007). Instead, growing identification with non-using groups - along with de-identification from substance-using groups - frames recovery as a socially-negotiated process of identity change linked to change in group memberships.

Whilst SIMOR emphasises the social context of recovery, SIMCM emphasises cognitive mediators of recovery maintenance. SIMCM suggests several implicit and explicit processes in the association between social groups, identity, and maintenance of recovery (Frings, Melichar, & Albery, 2016). Greater preference for recovery self-help group memberships over past using-group memberships has been linked to recovery self-efficacy (Buckingham, Frings, & Albery, 2013). Further, stronger *implicit* identification as a 'drinker' - indicative of greater accessibility of the drinker identity and faster processing of alcohol-related cues - has been linked to higher alcohol consumption (Frings et al., 2016). Finally, greater importance attributed to group sanctions for relapse by people who are highly identified with their recovery group suggests that social identity is an important contributor to the effectiveness of social controls for protecting against relapse (Frings & Albery, in press; Moos, 2011).

### 1.1. Integrating social network and social identity approaches to recovery

Both social network analyses and social identity approaches articulate ways in which social networks impact on substance use and recovery. In social identity approaches, social network effects are framed at a group level in line with the proposition that group memberships - rather than the aggregate effect of individual network members - guides group members (Turner et al., 1987). In contrast, social network analysis focuses on structural aspects of networks of *individuals*, including the extent to which individuals share connections to others, position and status within the network, and how the number and strength of positive or negative ties between network members contributes to the stability of the network over time (Easley & Kleinberg, 2010).

Despite the focus of both social network and social identity traditions on how people are informed by their social contexts, the two bodies of literature have remained relatively separated and there has been little work to integrate the two approaches. Kobus (2003) emphasised the need to integrate social network and social identity approaches to further understanding of how social environments are associated with substance use and recovery at structural and psychological levels of analysis. Further, Kobus (2003) called for the mapping of the social

networks to facilitate greater integration of social approaches to examining substance use, including integration of social network and social identity approaches.

Such an approach promises a novel framework for understanding how the structure of the network *at the group level* is associated with identity (Iyer, Jetten, & Tsivrikos, 2008). A social identity framework further enriches this by providing a theoretical model for understanding how group-level features of the network inform the psychological context in which recovery and identity change is negotiated and linked to recovery capital.

### 1.2. Multiple group memberships and ties between network members

Adults seek to maintain a sense of self-consistency with, and equilibrium between, groups when they belong to groups that hold diverging norms and values. Turner-Zwinkels, Postmes, and van Zomeren (2015), reported that people attempted to use a hierarchy when attempting to 'harmonise' value conflicts between groups that differed in how self-defining and important they were to identity. In the context of substance use, Verkooijen, de Vries, and Nielsen (2007) reported that adolescents rated their substance use as in line with the substance use of their group memberships when all the groups they belonged engaged in that same level of substance use (i.e., all low or all high). However, when they belonged to groups who differed in their perceived substance use - for example where one group engaged in high use and another engaged in low use - adolescents rated their own substance use as between the groups, suggesting an attempt to find a balance between competing group norms. In each study, identity, values and behaviour were contextualised by multiple group memberships and efforts to decrease identity dissonance stemming from groups that were incompatible on one or more dimensions.

Finally, the quality of relationships between groups sets the social climate in which change is negotiated (Iyer et al., 2008). Understanding the determinants of intergroup relations has been a central theme in social identity theory, with cognitive and affective information on groups and group relations factored into the content of social identities (Iyer et al., 2008; Mackie, Smith, & Ray, 2008). How group memberships are understood and represented as an identity network, the diversity and compatibility of groups in the existing network, and the compatibility of new groups with the existing network each influence whether a social group change represents a break in self-concept that is detrimental to wellbeing (Iyer et al., 2008). Further, it is unclear how the compatibility of groups that differ in substance use is associated with recovery capital despite the theoretical need to change social group memberships to support changes in health behaviour (Best et al., 2016; Oyserman et al., 2007).

### 1.3. The current study

Social relationships are of high importance in young people (Arnett, 2005), and are linked to differences in young people's patterns of alcohol and drug use in social settings (Duff, 2005; Verkooijen et al., 2007). In an alcohol and drug treatment setting, Vik et al. (1992) found that the effectiveness of social support for supporting treatment was moderated by the perceived similarity of the social network to the self, implicating social identity processes in the recovery capital of young people.

The current paper presents further analyses of a previously reported pilot study examining group substance use, social identity and recovery capital amongst young adults in residential alcohol and drug treatment (Mawson, Best, Beckwith, Dingle, & Lubman, 2015). The study identified that higher group substance use was associated with recovery capital, with higher identification and importance of lower-substance using groups associated with higher environmental quality of life and trending to an association with higher social recovery capital ( $p < 0.10$ ). In contrast, greater importance attached to heavier-using

groups was associated with a non-significant trend to lower recovery capital. Associations between identification and other aspects of the group network were not examined.

The aim of the current paper is to explore associations between social identity, recovery capital, and characteristics of the network of social identities not previously reported, including number and diversity of social identities, relationships between groups, and compatibility of groups who engage in different levels of substance use. It is hypothesised that recovery capital will be associated with (i) the compatibility of higher and lower using groups with other groups in the network, (ii) the density of ties between groups, and (iii) the quality of ties between groups.

## 2. Method

### 2.1. Participants

Participants were 15 males and 5 females (mean age = 19.8,  $SD = 0.8$ ), recruited from three youth residential detoxification facilities located in inner Melbourne ( $n = 10$ ), suburban Melbourne ( $n = 1$ ), regional Victoria ( $n = 4$ ), and one residential rehabilitation facility ( $n = 5$ ) in outer Melbourne, Australia. Detailed information on participant recruitment and demographic information has been previously reported in Mawson et al. (2015).

Amongst the fifteen participants in residential detoxification, twelve reported daily substance use in the past 28 days. Of these, eight reported daily use of a single substance including alcohol ( $n = 1$ ), cannabis ( $n = 5$ ) and amphetamines ( $n = 2$ ). Of the four reporting polysubstance use, one reported daily use of two substances (alcohol and cannabis), two reported daily use of three substances (alcohol, amphetamine, and prescribed opioid use; cannabis; inhalant, and prescribed sedative use) and one reported daily use of four substances (alcohol, cannabis, amphetamines, and prescribed sedatives).

### 2.2. Materials

#### 2.2.1. World Health Organisation Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST 3.0; Humeniuk, Henry-Edwards, Ali, Poznyak, & Monteiro, 2010)

Question Two of the ASSIST 3.0 assesses past 28-day frequency of use on a five-point Likert scale (0 = Never, 4 = Daily or almost daily) and has demonstrated concurrent validity to the Addiction Severity Index ( $r = 0.71–0.89$ ).

#### 2.2.2. Assessment of Recovery Capital scale (ARC; Groshkova et al., 2013)

The ARC is a 50-item self-report measure of personal recovery capital and social recovery capital. Items are dichotomously scored (0 = no, 1 = yes) providing for a score range of 0–25 in each domain, with higher scores indicating higher capital. Internal consistency of the ARC total, personal, and social domain scales ranged from  $\alpha = 0.89–0.96$ .

#### 2.2.3. Social Identity Map and Exeter Identity Transition Scales (ExITS; C. Haslam et al., 2008)

The social identity map and ExITS were used together to map participants' social group memberships and group substance use, and to record identification with and perceived compatibility of each group with other groups. The social identity map is a graphic representation of respondents' social networks based on the model outlined by Jetten and colleagues (Cruwys et al., in press; Jetten, Haslam, Iyer, & Haslam, 2010) and adapted for representation of group substance use in the context of recovery (Best et al., 2014; Mawson et al., 2015). The map yields quantitative data regarding (i) number of groups in the network; (ii) group importance (very, moderately, somewhat); and (iii) substance use of group members. Perceived substance use by group members follows conventions established

in Project MATCH for assessing social network alcohol consumption (Longabaugh et al., 1998) and included no-use, light-moderate, and problematic-heavy use. Group substance use ratings were derived from the category of use most frequently assigned to group members.

The ExIT scales assess the number, importance, congruence, and strength of identification with up to six groups. All items were rated on a 7-point likert-style scale ranging from 1 (disagree completely/not at all) to 7 (agree completely/very well). Identification was assessed with the statement "I identify with [group]". Group compatibility with other groups was assessed with the question "How well did this group fit with your other groups before the start of your recovery journey". Prior research has found these scales provide a valid measure of the range, identification and compatibility of group memberships (Beckwith, Best, Dingle, Perryman, & Lubman, 2015; C. Haslam et al., 2008; Iyer et al., 2009).

### 2.3. Procedure

Study approval was granted by the Monash University Human Research Ethics Committee and Eastern Health Human Research Ethics Committee. Recruitment was restricted to those aged 18 or more, and participation was voluntary. Informed consent preceded all interviews, emphasising that participation would not influence ongoing treatment. Interviews ranged from 50 to 70 min and participants were paid \$20 for their involvement. For further information see Mawson et al. (2015).

### 2.4. Study design and analyses

The study employed a correlational, cross-sectional design. Analyses were conducted in SPSS Statistics 23.0 and assessed at the conventional significance level of  $p < 0.05$ . Power analyses conducted in G\*Power suggested that the study was underpowered to detect all but large effects above  $r^2 = 0.30$ .

For inferential analysis, the number of ties between groups was used as an index of network density. Frequency counts were conducted for the number of positive as well as negative relationships between groups (i.e., where groups were reported to have experienced conflict or antagonism). Diversity of group memberships was calculated according to procedures provided by S. A. Haslam (personal communication, 2016), and involved dividing the total number of groups ( $x$ ) by the number of links between groups ( $y$ ) plus one ( $x / (y + 1)$ ) so that a higher ratio of groups to links indicated more diversity of group memberships. Substance use ratings were converted to an interval scale with higher scores indicating higher group substance use (no use = 1, casual use = 2, problematic use = 3). For compatibility of higher-using groups, compatibility ratings were multiplied by group substance use (casual use = 1, problematic use = 2), in line with conventions established in Project MATCH (Longabaugh et al., 1998). For compatibility of lower-using groups, compatibility ratings were multiplied by group substance use reverse-coded to give greater weight to lower substance use (no use = 3, casual use = 2, problematic use = 1), with higher scores indicating greater compatibility of lower-using groups with other groups.

Zero-order correlations were conducted between number and diversity of group memberships, density of ties, frequency of positive and negative ties, group substance use, group identification and compatibility, and personal and social recovery capital. Due to the small sample size, missing values were not replaced and there were no corrections to outlying values. When significant,  $r^2$  effect sizes were computed to indicate the magnitude of the effect, with weak ( $<0.09$ ), medium (0.09–0.25) and large ( $>0.25$ ) effects evaluated in line with the recommendations of Gravetter and Wallnau (2007).

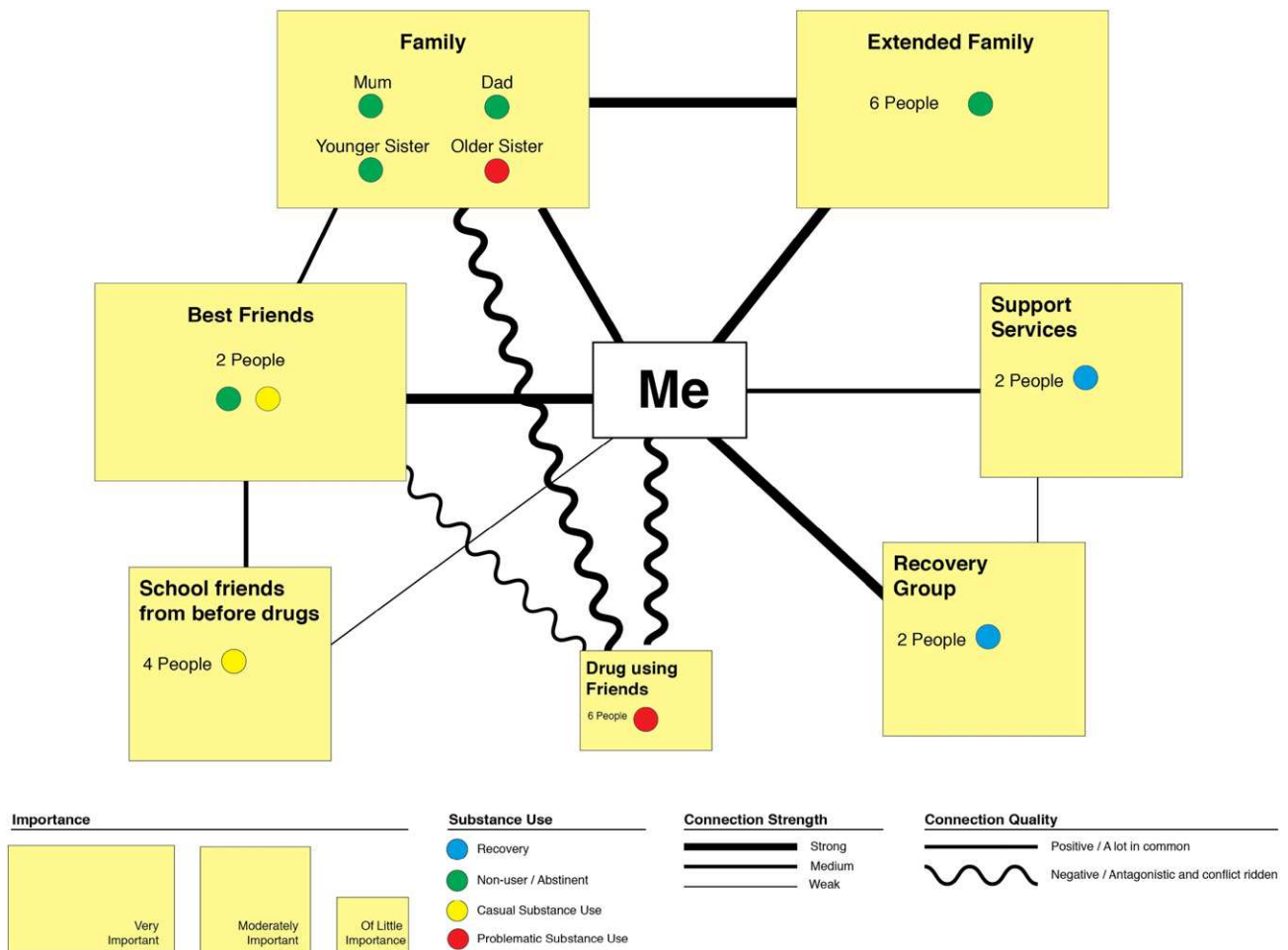


Fig. 1. Typical map of participants' group-level social networks.

### 3. Results

#### 3.1. Group memberships and relationships between groups

Participants reported a mean of 4.50 ( $SD = 1.57$ ) group memberships, with 4.35 ( $SD = 3.39$ ) ties between the groups. On average, 3.20 ( $SD = 2.40$ ) ties between groups were rated as positive, whereas 1.32 ( $SD = 1.77$ ) were rated as negative. Fig. 1 presents a social identity map characteristic of the types of maps produced by participants, and illustrates a prototypical range of groups, ties between groups, and substance use by groups in participants' networks. As can be seen in this map, family groups were typically rated as *very important*, with substance-using groups most often rated *of little importance*.<sup>1</sup> For ties between groups, participants reported the presence of negative, antagonistic ties more frequently between substance-using groups and other groups, suggesting some antagonism between these groups and discouragement of participants' memberships of substance-using groups and using identities. Finally, whilst not depicted due to their infrequency, some participants reported both positive and negative ties between groups.

Table 1 presents information on participants' group memberships. All but two participants reported the presence of immediate family in their social network, with seven also reporting one or more extended family groups. All participants reported at least one peer group membership. Identification with groups was high (i.e., above the scale midpoint) for all group memberships, and highest for family groups and

recovery peer groups. Identification with general peer groups – those groups who were formed around activities other than substance use – was only slightly higher than identification with substance-using groups. Substance use was more than twice as high amongst substance-using friends compared to general friend groups, whilst the perceived compatibility of substance-using groups with other groups was lowest of all groups and less than half that of general friendship groups. General peer groups had the highest compatibility ratings of all group types, suggesting that general peer groups may be most likely to provide a link between social identities that have less in common. In contrast, substance-using groups – as the least compatible of all groups with other groups – may be more likely to be kept separate from (or at a distance by) other groups.

#### 3.2. Associations between group memberships and recovery capital

Table 2 presents associations between the number and diversity of group memberships, density of group ties and frequency of positive and negative ties, group substance use and identification, and group compatibility with other groups weighted by substance use. Group substance use and identification have been previously reported (Mawson et al., 2015) and are focused on here only in relation to group ties and group compatibility with other groups.

Large  $r^2$  effect sizes were observed for the majority of associations. Personal and social recovery capital was associated with lower group diversity ( $r^2 = 0.29, 0.25$ ), lower group substance use ( $r^2 = 0.25, 0.22$ ), having a higher number of positive links between groups ( $r^2 = 0.37, 0.30$ ), and greater compatibility of lower substance-using groups with other group memberships ( $r^2 = 0.36, 0.22$ ). Higher identification with

<sup>1</sup> For further information on group importance see Mawson et al. (2015).

**Table 1**  
Group memberships, substance use, identification, and compatibility on the social identity map and exeter identity transition scales.

Group type	Social identity map			ExITS <sup>1</sup>	
	Frequency of group memberships		Group substance use <sup>2</sup>	Current identification	Pre-treatment compatibility
	Group N	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Family					
Immediate	20	1.00 (0.46)	0.67 (1.08)	5.19 (2.02)	3.50 (1.82)
Extended	9	0.45 (0.67)	1.21 (1.22)	6.36 (1.11)	2.86 (1.86)
Peer					
General	30	1.50 (0.95)	1.32 (0.98)	4.65 (0.93)	5.23 (2.80)
Substance using	9	0.45 (0.69)	2.93 (0.19)	4.35 (1.25)	2.50 (1.22)
Partners	8	0.40 (0.68)	1.75 (0.61)	4.25 (1.78)	3.00 (2.35)
Recovery	3	0.15 (0.37)	1.00 (0.00)	6.67 (0.58)	–
Support services	6	0.30 (0.57)	0.00 (0.00)	3.50 (0.87)	3.90 (2.61)

Notes: N = mean number of group type. 1 = ExITS scale identification, importance and congruence range 1–7. 2 = Substance use scale range 1–3.

lower using groups was associated with greater compatibility of lower using groups ( $r^2 = 0.33$ ). Similarly, higher identification with heavy using groups was associated with greater compatibility of heavy using groups with other groups ( $r^2 = 0.29$ ).

A number of significant associations were also observed between groups and aspects of the group network. Higher diversity of group memberships was associated with higher group substance use ( $r^2 = 0.34$ ). Lower diversity of group memberships was associated with having a higher density of ties between groups, a higher frequency of positive ties between groups, and greater compatibility of lower substance-using groups with other groups ( $r^2 = 0.42, 0.46, 0.29$ ). Having more ties between groups was associated with fewer group memberships and a higher number of positive ties between groups ( $r^2 = 0.37, 0.48$ ). Having a higher number of negative ties between groups was associated with greater compatibility of heavier using groups ( $r^2 = 0.42$ ).

#### 4. Discussion

The aim of the current paper was to explore associations between social identity, recovery capital, and characteristics of the network of social identities including number and diversity of social identities, relationships between groups, and compatibility of groups who engaged

in different levels of substance use. The first hypothesis, that recovery capital would be associated with the compatibility of higher and lower using groups with other groups was partially supported by the observed associations between higher compatibility of lower using groups and personal and social recovery capital, but not for the association between compatibility of higher substance-using groups and recovery capital. The second hypothesis, that recovery capital would be associated with the density of ties, and measured by the number of connections between groups, was not supported. The third hypothesis, that recovery capital would be associated with the quality of ties between groups was partially supported, with a higher number of positive ties between groups associated with both personal and social recovery capital.

##### 4.1. Group compatibility

Associations between the compatibility of group memberships, social identities and recovery capital have not previously been reported, and suggest that the compatibility of a lower substance-using social identity with other social identities is important for supporting both personal and social recovery capital. Earlier findings suggested that lower using groups and the identity derived from these groups were given greater importance than heavy using groups and the using

**Table 2**  
Associations between group memberships, compatibility, relationships, substance use, and recovery capital.

Recovery capital	1	2	3	4	5	6	7	8	9	10	11
Recovery capital											
1. Personal	–										
2. Social	0.87***	–									
Group memberships											
3. Number	–0.01	0.05	–								
4. Diversity	–0.54*	–0.50*	0.39†	–							
5. Substance use <sup>a</sup>	–0.50*	–0.47*	0.12	0.58**	–						
Group relationships											
6. Connections	0.39†	0.41†	–0.61**	–0.65**	–0.34	–					
7. Positive ties	0.61**	0.55*	–0.17	–0.68***	–0.49†	0.69**	–				
8. Negative ties	0.31	0.37†	0.15	–0.43†	–0.08	0.38	0.38†	–			
Non-using groups											
9. Identification <sup>a</sup>	0.37	0.44	0.05	–0.38†	–0.81**	0.23	0.20	0.25	–		
10. Compatibility × lower use <sup>††</sup>	0.60**	0.47*	–0.14	–0.54*	–0.67**	0.31	0.30	0.32	0.57*	–	
Heavy-using groups											
11. Identification <sup>§</sup>	–0.32	–0.29	–0.08	0.39	0.66**	–0.02	–0.36	0.00	–0.41	–0.33	–
12. Compatibility × higher use <sup>††</sup>	0.23	0.17	0.09	–0.29	0.55*	0.17	0.02	0.65**	–0.32	0.24	0.54*

<sup>a</sup> Group substance use and group identification previously reported in Mawson et al. (2015).

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

†  $p < 0.10$ .

††  $n = 18$ .

†††  $n = 19$ .

identity (Mawson et al., 2015). The additional association of the compatibility of lower substance-using groups and identity with recovery capital suggests that it is the importance and fit of lower using groups – rather than of higher using groups – that contributes to young adults' nascent recovery social identity when in treatment. Further, this emphasis on lower-using group memberships is in line with research emphasising the *addition* of non-using peers and groups (rather than simply the attrition of using peers and groups) that contributes to the maintenance of treatment gains (Hawkins & Fraser, 1987; Litt et al., 2009; Mohr, Averno, Kenny, & Del Boca, 2001) and ongoing development of a socially-embedded recovery identity outside of the treatment setting (Dingle, Cruwys, & Frings, 2015; Kellogg, 1993; Radcliffe, 2011). Indeed, increased proportion of the network who are abstinent or engage in low levels of substance use and increased importance of such groups are important aspects of social network change and identity construction in recovery (Best et al., 2016; Kellogg, 1993). It may be that greater compatibility of lower using groups and an increase in the proportion of lower using groups in the social network are mutually supportive processes in the development of recovery networks and the recovery identity.

A second pattern of associations centred on young adults who belonged to higher-using networks, and indicated that higher group substance use was linked to poorer compatibility of lower-using identities, fewer group memberships, and less diversity of social group memberships that could be called on outside of the substance-using group and using identity. This suggests a subgroup of young adults who belong to smaller networks, who have less diversity of identity resources, see lower-using groups as incompatible with existing group memberships and their existing identity, and have fewer resources available to support recovery. Here, assertive linkage to increase positive contact with non-using and recovery groups and aftercare support following treatment may be important next steps for maintaining continuity of support with services and increased access to social resources that support lower use and ongoing accrual of recovery capital (Best & Savic, 2014; Best et al., 2012; White & Kelly, 2011).

#### 4.2. Relationships between groups and social identities

Young adults' intergroup relationships were predominantly positive, with a higher frequency of positive ties between groups. The association between positive ties between groups and personal and social recovery capital suggests that identity networks that are characterised by more positivity in intergroup relationships are supportive of recovery capital. This is consistent with the finding that group compatibility, and the compatibility of lower using groups in particular, was associated with recovery capital (Mawson et al., 2015). Together, they suggest evidence for the proposition that the social context in which social identities are embedded and in which attempts at change are undertaken has implications for recovery capital. Higher frequency of positive intergroup ties was also linked to lower group substance use, lower diversity of group memberships, and greater density of ties between groups. This suggests that in group-networks where lower use is normative, lower diversity and greater connectedness of groups may support the consistency of social messages endorsing lower substance use. Group networks characterised by positive intergroup ties may also support recovery capital through greater capacity to share information about young adults' recovery and coping with challenges in multiple social contexts. Finally, the lack of association between positive ties and compatibility of groups suggests that positivity of ties and compatibility of groups have independent links with recovery capital.

A higher frequency of negative, antagonistic ties between groups was associated with higher compatibility of heavier using groups. This association suggests that young adults embedded in heavy using group networks are more likely to perceive other heavy using groups as identity-compatible, but also that these networks and identities are characterised by higher levels of antagonism. Heavy using groups

appear to be a focal point for conflict between groups, poorer compatibility of a lower-using identity, and lower recovery capital. This is important in the context of alcohol and drug treatment, where a greater dissonance between high and low-using social identities may provide motivation toward recovery, a possibility that is cautiously suggested by the trend to an association between negative group ties and higher social recovery capital.

#### 4.3. Diversity of group memberships

Lower diversity of group memberships was linked with higher group substance use and lower personal and social recovery capital. This finding is consistent with social identity uncertainty theories in adolescent psychosocial development (Hogg, Siegel, & Hohman, 2011), suggesting that a greater diversity of social identities may be linked to lower identity commitment, higher identity uncertainty, and attraction to groups who engage in riskier behaviours (Dumas, Ellis, & Wolfe, 2012; Hogg et al., 2011). Further, higher diversity of group memberships and higher group substance use was associated with fewer connections between groups, suggesting that the group network may have less capacity to monitor recovery and co-ordinate in the provision of recovery-congruent support (Moos, 2011).

#### 4.4. Limitations and future research

The chief limitation of this study relates to its small sample size and limited power, resulting in an inability to provide a more nuanced understanding of how multiple group memberships are uniquely associated with recovery capital. Further analyses of associations between group network characteristics, social identity processes and recovery are key areas for future research. One set of questions focuses on social identity complexity (Roccas & Brewer, 2002) and how subjective representations of multiple group memberships, overlap of social identities, and identity compatibility are associated with identity change in recovery. A second set of questions focus on intergroup emotions and relationships (Mackie et al., 2008; Smith, 1993), and how positive intergroup ties and other affect-laden group evaluations are associated with social identity and recovery capital. Finally, future research in a larger sample should investigate whether the trends toward an association between negative group ties and social recovery capital is replicated and achieves significance. If so, such an association suggests that the development of negative ties between key group memberships may represent a social crisis that precipitates treatment entry as a way of reducing dissonance and increasing distance from a negatively evaluated using identity (Kreiner & Ashforth, 2004; Tajfel & Turner, 1979; Weisz, 1996).

#### 4.5. Conclusion

Structural characteristics of young adults' network of group memberships and social identities demonstrated a number of associations with recovery capital in early treatment. Having a higher number of positive ties between groups was associated with higher personal and social recovery capital. Further, the compatibility of lower substance-using groups with other groups – and of the lower using identity with other identities – was linked to higher recovery capital, suggesting that networks in which lower use is normative may provide social and psychological resources supportive of recovery in early treatment. Finally, higher diversity of group memberships was associated with lower recovery capital and greater substance use by groups. Future research is required into mechanisms through which positive intergroup relationships and social identity compatibility support recovery capital and identity change that is central to the transition to recovery.

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## Contributors

EM carried out data collection, statistical analysis, and drafted the manuscript. DB conceived of the study, participated in its design and coordination, and helped to draft the manuscript. DL contributed to the development of the manuscript. All authors read and approved the final manuscript.

## Conflict of interest

The authors declare that they have no competing interests.

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