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Building addiction recovery capital through online participation in a recovery community

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ABSTRACT

Rationale: This study examines how online participation in a community of recovery contributes to personal journeys of recovery. It investigates whether recovery capital building – as indicated by increased levels and quality of online social interactions – and markers of positive identity development predict retention in a recovery program designed around fostering community involvement for early stage recovery addicts.
Hypotheses: It was predicted that online participation on the group's Facebook page and positive identity development are associated to retention in the program.
Methods: To map how participants interact online, social network analysis (SNA) based on naturally occurring online data ($N = 609$) on the Facebook page of a recovery community was conducted. Computerised linguistic analyses evaluated sentiment of the textual data (capturing social identity markers). Linear regression analyses evaluated whether indicators of recovery capital predict program retention. To illustrate the findings in the context of the specific recovery community, presented are two case studies of key participants who moved from the periphery to the centre of the social network. By conducting in-depth interviews with these participants, personal experiences of engagement in the online community of group members who have undergone the most significant changes since joining the community are explored.
Results: Retention in the program was determined by a) the number of comment 'likes' and all 'likes' received on the Facebook page; b) position in the social network (degree of centrality); and c) linguistic content around group identity and achievement.
Conclusion: Positive online interactions between members of recovery communities support the recovery process through helping participants to develop recovery capital that binds them to groups supportive of positive change.

> "… the longer people are on the Internet, the more likely they are to use the Internet to engage in social-capital-building activities" (Kavanaugh and Patterson, 2001, p. 507)

1. Introduction

1.1. Building recovery capital through social networks

Traditional (offline) social networks are now recognised as helping make recovery more sustainable (White and Kelly, 2010) by providing people with opportunities to develop their recovery capital, i.e., "the sum total of one's resources that can be brought to bear on the initiation and maintenance of substance misuse cessation" (Cloud and Granfield, 2008, p. 1972). Recovery capital can be developed through several avenues: a) building social capital through developing and strengthening links with both group members (other people in recovery) and outgroup members

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(reaching out to the broader community), referred to as bonding and bridging capital respectively; and b) building community and cultural capital (Best and Laudet, 2010; Groshkova et al., 2013). Based on the work of Putnam (2001), the concept of social capital has become a key theoretical framework around support and resources and has been applied to addiction recovery populations (Cloud and Granfield, 2008). The accumulation of greater recovery capital is considered a marker of recovery progress and a predictor of sustained recovery, therefore taking the form of a currency for measurement in recovery research (Groshkova et al., 2013).

Being part of many supportive social networks of addiction recovery was shown to have positive effects on wellbeing (Jetten et al., 2012; Litt et al., 2009; Longabaugh et al., 1998, 2010). The aim of the current study is to extend this evidence by examining the role of supportive *online social networks* in helping people in recovery. It is proposed that online social networks can assist recovery by helping build *recovery capital* at the same time supporting the development of a positive identity. A positive identity can, in turn, further support efforts to maintain a drug-free lifestyle.

1.2. Social identity in recovery

While it is known that supportive social networks are beneficial for recovery and help the development of recovery capital, theoretical resources from social psychology are applied to understand the underlying processes, especially Social Identity Theory (SIT, Turner et al., 1987; Turner, 1982). Increased recognition of the importance of developing positive social identities in the recovery process stems from the SIT proposition that group membership is fundamental to understanding adherence to the norms and values of social groups. In particular, identification and engagement with valued groups shape individuals' behaviour through a desire to be a part of the group. As a result, aspiring members will increasingly adhere to group norms and values. Applied to health, these ideas lead to developing a 'social cure' approach (Jetten et al., 2012) in which group belonging is beneficial, not only because it provides access to emotional support and practical assistance from other group members, but also because it has a direct (positive) influence on behaviour. The benefits of belonging to one or more groups are translated into positive effects on health and wellbeing (Cruwys et al., 2013, 2014: Haslam et al., 2014).

This approach was applied to addiction recovery in the Social Identity Model of Recovery (SIMOR, Best et al., 2016), which proposes that recovery is associated with transitioning from the more excluded group membership of 'using groups' to groups that are supportive of recovery; this transition includes a shift to more positive values, beliefs, attitudes, and ultimately behaviours. In this model, the transition from active addiction to recovery is a staged process that takes place over time and through exposure to recovery groups at a time of disenchantment with addiction lifestyles (with the ensuing dissonance between addiction group membership and other valued life goals such as relationships and parenting). Such dissonant experiences can loosen the bonds to groups involved in addictive behaviours and support a gradual transition to engagement with recovery groups. These ideas are consistent with findings from the Alcoholics Anonymous literature where the importance of facilitating positive changes in social networks through a move to health-promoting social networks has been well recognised (Kaskutas et al., 2002; Kelly et al., 2009, 2012).

1.3. The role of online social interactions in recovery

As new technologies enable a variety of ways of communication, the ways in which social support in recovery is delivered and received has expanded to include online modes (Moorhead et al., 2013; White and Dorman, 2001). From a social interaction point of view, there are both advantages and limitations in using new technologies for communication. The access to social support is facilitated through online communication which is particularly useful in cases of social, geographical, and mobility-related isolation (Rodham et al., 2009; Savic et al., 2013). However, despite some evidence of similar outcomes (Shahab and McEwen, 2009), it is still debated whether the quality of social support received online is comparable with its face-to-face alternatives (Chung, 2013; Finfgeld, 2000). The ability to interact online with people facing similar issues regardless of their physical proximity promotes the creation of significantly broader, borderless 'online communities of support' that can include not only those people recovering from addiction, but also their supporters and advocates. Therefore, these communities have the potential not only to support individual change, but also social change either as an alternative to or a supplement to face-to-face support networks. As online social interactions become more common across all groups in society, more evidence of significant health benefits linked to online engagement is emerging. For example, recent research by Hobbs et al. (2016) based on a large US dataset (i.e., 12 million social media profiles) suggests that people who are well integrated in online social networks such as Facebook are likely to have lower mortality rates.

As in many other areas of research, the use of technology in accessing support in recovery has also opened new possibilities in terms of how we collect data in the field of addiction recovery. The recognition that recovery is a dynamic and long-term process goes hand in hand with more dynamic ways of approaching research which the emergence of new technologies make possible. Shneiderman (2008) asserted in 'Science 2.0' that "traditional scientific methods need to be expanded to deal with complex issues that arise as social systems meet technological innovation" (p. 1349). In the current study, the use of more traditional scientific methods such as social network analysis and conducting in-depth interviews is complemented by approaches designed to capture the rich and dynamic context of online interactions in the addiction recovery field (such as computerised linguistic analyses that can be applied to large textual datasets). These methods permitted hypothesis tests from SIT and, more specifically, from the Social Identity Model of Recovery. Hypotheses are derived by mapping changes in belonging and engagement in recovery-supportive groups as captured by linguistic style and network location, and by examining these indicators against retention in a recovery community as a recovery outcome.

1.4. Context of research

The focus of the study is on a specific program in the UK, Jobs, Friends and Houses (JFH), a recovery initiative that incorporates social engagement and identity change supported by an overarching process of building recovery capital. JFH is a social enterprise that engages addicts in early recovery in apprenticeships in building professions while working on the renovation and construction of recovery housing in the north of England town of Blackpool. Participants in the program are actively involved in employment and training and are provided with recovery housing; as a part of a lifestyle change program, many of them also attend recovery mutual aid group meetings. The program illustrates particularly well some key SIT principles as a highly visible and attractive 'ready-made' positive social identity change is enabled (Best et al., 2016). This positive social identity is constructed around work and the re-invigoration of a deprived community that has resulted in a strong sense of engagement and bonding among program participants and staff members (Best, 2016). Individuals

who engage with JFH are enabled to challenge their own and others' negative perceptions and prejudices through the adoption of a work uniform and through engagement in activities in a group that contributes to and is positively valued in the local community.

As part of the building of the recovery community, JFH introduced a Facebook page to perform two primary functions: (1) to provide a recovery-supportive online community for participants; and (2) to allow the outside world (including a range of community stakeholders) to engage with JFH. The community and its online platform provides an excellent opportunity to examine the role of online social interactions in supporting recovery capital development and the transitioning to a successful recovery identity, which in turn should predict positive outcomes in terms of retention in the program.

1.5. Rationale and approach

To examine the role of supportive online interactions in recovery, the study focuses on understanding the intragroup and intergroup dynamics as a whole (looking at the structure of the online social network), as well as changes in the 'agents' of the network (looking at changes within individuals in the group). As such, the study necessitates a mixed-methods approach. At the same time, the increased widespread use of technologies for online communication enables access to more data sources which are present in more varied formats. To take advantage of these affordances, social network and textual data extracted from the group's Facebook page were analysed, complemented by qualitative data from in-depth interviews with key agents in the social network, as well as quantitative retention data. A diverse and complementary range of data sources and a mixed methods approach (Denscombe, 2008) were used to ensure that the complex and dynamic processes that underpin a successful recovery journey are captured. While the quantitative components of the study provide structural data and aggregated linguistic information regarding the online social interaction in the recovery community, the qualitative data allows insight into the subjective experience of positive change.

As a first measure of online engagement in the community of support, the growth in the online activity as indicated by the number of posts and comments on the Facebook page was used. Specific markers of recovery capital development, identified by charting the first eight months of activity in the JFH Facebook page (in terms of its growth and change over these eight months), were used to examine how recovery capital is developed in the online community. This was accomplished by examining the online community of support as made up of three primary groups of members and the interactions between them: a) JFH program participants; b) JFH staff, and c) external individuals (broader community members).

By examining the connections between the members of the online community and how they change in the eight months of our investigation, variations in the dynamics of the group at an internal level (intragroup) are identified. Social network analysis (SNA) represents a comprehensive approach to understanding relational features in groups (i.e., contacts, ties, connections, group attachments, and encounters that relate one group member to another), so it provides an ideal tool to capture intragroup and intergroup dynamics and communication in the online community studied (Scott, 2012). Theoretically, SNA can be seen as derived from a form of social exchange theory (Emerson, 1976), and more recently it has been linked to Putnam's (2001) social capital theory (where social networks are considered a specific form of social capital). However, "SNA provides a vocabulary and set of measures for relational analysis, but it does not imply the acceptance of one particular theory (…)" (Scott, 2012, p. 8). For instance, the centrality of a group member in the network would denote increased communications with the other group members; in SNA the more linkages an 'agent' has the more central its position in the network would be. Thus, centrality coefficients derived from SNA can be used as measures of the *quality of online engagement*. Centrality coefficients can also be used to capture prototypicality (i.e., how representative a group member is for the whole group) and influence within the group. Moreover, SNA allows for the identification of those group members who have undergone the most change in their location in the social network, reflected by movement from the periphery to its centre, as shown in SNA maps in Fig. 1. As a result, validation and further investigation of how recovery capital is developed was achieved by conducting in-depth interviews with two of the most representative members of the group. Group members revealed as the most central agents in the online social network towards the end of the eight-month period in the JFH participant cohort were identified and invited to participate in in-depth interviews.

Changes in the social identity of the group members are captured through conducting a computerised analysis of the language used by participants in their contributions to the Facebook page. The computerised language analysis software Linguistic Inquiry and Word Count (LIWC) (Pennebaker et al., 2007; 2015) captured participants' levels of identification (Pennebaker, 2011) with the recovery group, their emotions (Chung and Pennebaker, 2014; Gill et al., 2008), and social and cognitive processes (Pennebaker et al., 2015).

Indicators of recovery capital and identity change are used to examine whether they are predictive of retention in the program. Retention data were accessed from the JFH administrative team in the form of joining and departing dates for each member of the JFH housing and employment program. As a positive outcome of recovery, program retention as *duration of stay in the recovery program* was used. This decision is based on evidence that program retention has previously been found to be associated to long-term positive recovery outcomes (Zhang et al., 2003). Across a range of treatment outcome studies (e.g., the Drug Abuse Reduction Programme; Simpson and Sells, 1990 in the US, and the National Treatment Outcome Research Study, Gossop et al., 2001, in the UK), there is strong evidence that longer retention in specialist treatment services is associated with better outcomes across a range of outcome indicators. Similarly, for recovery-oriented mutual aid groups, Kelly (2016) has reported on the importance of both the intensity and the extensity of meeting attendance on reductions in substance use and improvements in psychological health.

The study approach can be divided into two parts: a) examining how recovery capital is built through online interactions, at the same time investigating changes in social identity; and b) testing whether online social engagement and the indicators of recovery capital and social identity change predict recovery outcomes (program retention).

2. Method

2.1. Participants

The study population (total $N = 609$) consisted of all participants in the online JFH Facebook community. This community includes JFH program participants ($N = 23$), JFH staff ($N = 5$), and community members ($N = 581$) who contributed to the online discussions over a period of eight months since the establishment of the JFH Facebook page. Of the JFH program participants, 91% were male and their ages ranged from 19 to 60 ($M = 34.57$, $SD = 10.86$); 32% left school with no qualifications, 26% had a high-school certificate, 16% A Level (Advanced) Education Certificate, and 26% had other types of educational qualifications. Regarding their employment status,

15% of the participants were never employed, 25% were previously employed but no longer working, 45% were employed for periods of time with breaks in between, and 5% were in continuous employment.

2.2. Outcome and predictor variables

To examine the effects of online engagement with a recovery community on retention in a recovery program, the following indicators were examined as predictors of retention:

1. *Overall levels of participation in the online community*, as levels of online activity on the group's Facebook page (number of posts and comments made);
2. *Quality of participation in the online community*, as centrality network coefficients derived from conducting social network analysis (SNA) by mapping the linkages between members of the online network through their online interactions (the underlying assumption is that centrality coefficients capture the quality of online interactions by being a result of number and type of connections in the network); and
3. *Social identity markers*, as word usage during the online interactions.

2.3. Analytic strategy

2.3.1. Social network analysis (SNA)

SNA is based on a conceptualisation of social structures as a network with ties connecting members and channelling resources (Wetherell et al., 1994). Therefore, the network coefficients of 'degree' centrality (i.e., the total number of connections connecting a node, Scott, 2012) and 'betweenness' centrality (i.e., how much a specific node can act as an intermediary between two other nodes, Scott, 2012) were used as indicators of the quality of online interaction. This choice of coefficients is based on the assumption that in a social network, betweenness and degree centrality are the most relevant indicators of a person's influence in the communication within the group (for example, the person with the highest betweenness centrality will be the most influential communicator in the network). SNA allowed the identification of those members of the online network who are the most influential agents in the group (through their position in the network). The centrality coefficients were calculated using the software R (SNA package) and were based on the online activity on the group's Facebook page in its first eight months.

All interactions between two members within the Facebook group (i.e., commenting on posts, liking posts, and liking comments) were classified as links (edges). The analysis was divided by months (from month 1 to month 8) and includes all contributions during this timeframe (i.e., posts, comments to posts, and likes of posts and comments). SNA maps were also created using the igraph package in R.

2.3.2. Computerised linguistic analysis

Linguistic Inquiry Word Count (LIWC) software was used for sentiment analysis of the online communications between the group members, including staff members and broader community members. Online communication data in the form of text were extracted from the group's Facebook page from all online text exchanges between participants. LIWC is a linguistic analysis software package designed by social psychologists Pennebaker et al. (2007; 2015) to capture a number of linguistic and psychological categories underpinning language (e.g., use of various function words, cognitive mechanisms, social processes, emotions, etc.). LIWC was used and validated in a range of health-related contexts including alcohol consumption (Lowe et al., 2013), depression (Baddeley et al., 2013; Rude et al., 2004), and suicide (Stirman and Pennebaker, 2001). The software's dictionary includes over 80 categories, but the most relevant in this context are: achievement (given the core purpose of the group to support members to achieve sustainable behavioural change), social identity (use of first-person plural pronouns as opposed to first-person singular pronouns), and emotions such as positive affect (as further indicators of the quality of the online engagement).

2.3.3. Correlation and linear regression analyses

In a first stage, a correlational analysis was conducted on all key variables, followed by linear regression analysis with the following variables entered as predictors:

- Network centrality coefficients (betweenness and degree centrality);
- Number of posts and comments;
- Number of post likes given and received;
- Number of comment likes given and received;
- Number of all likes given and received;
- Client-Client comments received, given and total;
- Client-Staff comments received, given and total;
- Total usage of LIWC categories in posts;
- Total usage of LIWC categories in comments;
- Total usage of LIWC categories in both posts and comments.

2.3.4. Qualitative analysis

The qualitative data were obtained through the in-depth interviews with two group members selected on the basis of being the most prototypical/influential group members in the social network (as indicated by SNA and illustrated in Fig. 1). The individuals who were identified as central by the end of the study window but had been peripheral at the start were approached to participate in an in-depth interview. To analyse the data, a deductive approach broadly derived from thematic analysis (Braun and Clarke, 2006) and framework approaches (as described by Pope et al., 2000) were used.

More specifically, at the start of the analysis, two of the authors first familiarised themselves with the data by independently reading and re-reading several times the transcripts of the in-depth interviews. Next, a thematic framework comprised of key concepts and themes by which the data can be examined a priori was drawn from our research questions and used in analysis. The outcome of the next step of the analysis was the classification of the data into the relevant categories and themes around the research questions; specifically, these categories focused on how recovery capital is developed in the program through experiences of both online and face-to-face interactions which were shared, agreed upon, and further refined collectively. The final categories were labelled, and the most illustrative quotes for each category were identified.

3. Results

3.1. Descriptive statistics

Computing the number of posts, comments, and likes made by staff, clients, and community members captured overall *online engagement*. Table 1 illustrates a breakdown by type of contribution made by each category of participant across the timeframe of eight months. The counts indicate that the participants from the broader community are particularly active in terms of comments and likes to the posts, which are mainly contributed by staff and clients.

Table 1
Number of online contributions made by members of the community on the JFH Facebook page across eight months.

Group members	Type of online contribution	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8
All	Posts and comments	382	388 (770)	579 (1349)	369 (1718)	530 (2248)	581 (2829)	796 (3625)	674 (4299)
	Post likes given	1167	878 (2045)	1856 (3901)	1440 (5341)	1880 (7221)	1756 (8977)	2667 (11644)	1857 (13501)
	Comment likes given	784	970 (1604)	825 (2429)	171 (2600)	634 (3234)	970 (4204)	825 (5029)	171 (5200)
Staff	Posts and comments	129	106 (235)	170 (405)	96 (501)	185 (686)	176 (862)	227 (1089)	316 (1405)
	Post likes given	188	147 (335)	302 (637)	209 (846)	385 (1231)	372 (1603)	567 (2170)	511 (2681)
	Comment likes given	168	303 (471)	237 (708)	69 (777)	168 (945)	303 (1248)	237 (1485)	69 (1554)
Clients	Posts and comments	145	155 (300)	214 (514)	132 (646)	208 (854)	286 (1140)	419 (1559)	253 (1812)
	Post likes given	365	252 (617)	415 (1032)	303 (1335)	549 (1884)	529 (2413)	898 (3311)	576 (3887)
	Comment likes given	143	318 (461)	235 (696)	33 (729)	143 (872)	318 (1190)	235 (1425)	33 (1458)
Others	Posts and comments	108	127 (235)	195 (430)	141 (571)	137 (708)	119 (827)	150 (977)	105 (1082)
	Post likes given	614	479 (1093)	1139 (2232)	928 (3160)	946 (4106)	855 (4961)	1202 (6163)	770 (6933)
	Comment likes given	473	349 (672)	353 (1025)	69 (1094)	323 (1417)	349 (1766)	353 (2119)	69 (2188)

Note. The values in parentheses represent cumulative numbers of online contributions for each subgroup.

3.2. Determinants of retention in the program

It was expected that retention would be associated with the indicators of recovery capital development (quantity and quality of online interaction) and indicators of a positive recovery identity development. In quantitative terms, online interaction was captured through the number of: a) posts made; b) comments made; c) post likes received; d) comment likes received; and e) all likes received. The quality of online interaction was captured by network structure, that is, the degree and betweenness coefficients, and linguistic indicators of positive affect. In addition, different types of recovery capital were captured by: a) number of connections (posts and comments) between members/clients (similar to bonding capital); b) number of connections between members and staff (internal level of support - bonding capital), and c) number of connections between members and broader community/others (similar to bridging capital). These statistics appear in Table 1 in the Supplementary Materials. The development of a positive social identity (identification with the recovery community) was captured through the use of the pronoun 'we' and achievement words. Retention in the program was coded in terms of total number of days in the program (range of 464 to 86 days).

Among indicators of online interaction, in-group validation, as captured by the number of likes received (for both posts and comments), is the strongest determinant of retention (see Table 2). The position occupied in the social network by participants (centrality in the network) is also a good indicator of program retention. In particular, degree centrality is significantly associated with retention. Regarding the content of communication, the computerised linguistic analysis revealed that collective identity markers such as the use of the pronoun 'we' in posts and achievement words in both posts and comments are the best determinants of retention in the program (see Table 2). Other marginally significant predictors include affect as positive emotions words.

Table 2
Retention time as predicted by Facebook page activity, network statistics, and LIWC categories (only significant predictors included in the table).

Variable	*B*	*SE*	β	R^2
Comment likes received	0.43	0.18	0.47*	0.22
Likes received (all)	0.08	0.03	0.43*	0.18
Comment-like difference	1.09	0.50	0.43*	0.19
Network degree	0.01	0.00	0.43*	0.18
LIWC We (Post)	3.89	1.76	0.43*	0.19
LIWC Achievement (Post)	0.56	0.26	0.43*	0.18
LIWC Achievement (All)	0.14	0.07	0.42*	0.17

LIWC = Linguistic Inquiry and Word Count. *$p < 0.05$.

It was expected that these findings would be consistent with data collected through in-depth interviews. The participants in the interviews were selected based on the SNA based on the online interaction between group members on the group's Facebook page. The two interviewees have been identified as the most prototypical members of the community based on their central position in the online network and their transition from the periphery to the centre of the network over the course of the eight months of the study. Fig. 1 illustrates configurations of the social networks for each of the eight months of our analysis. The different types of network members are colour-coded so the dynamic evolution of the network in the set timeframe is illustrated; that is, the movement of the 'clients' from the periphery to the centre of the network. In particular, the movement of the two selected participants (identified as 614 and 93 in Fig. 1), can be observed.

Both interview participants were male, aged 30 and 45. Participant 1 started with JFH in mid-January 2015, and, in his own words, before joining the community he was addicted, homeless, and living in a shelter. Participant 2 joined JFH from the start of the community (01/11/2014), and before that he was "on the sick [Disability Living Allowance] and working part-time - abstinent about one year - living in a recovery house - not a lot of support in the house - working in services taking clients on prescriptions to the gym, 16 h a week" (Extract 1).

3.3. Qualitative data findings

3.3.1. Bonding capital: reaching to the other group members

Bonding recovery capital refers to resources that are made available through linkages between group members. In this context (of online social interaction), it was found that the interviewees value the availability of online means of communication with other group members ('*live social connectivity*') and they see it an asset that supports their recovery:

> Extract 2: "It's good, sometimes you get notifications like 'has anyone seen T?' - and you get five phone calls. It is a really good support network (…) it's visible … it reminds me that you are part of something."

Another aspect of online communication that is seen as supporting bonding recovery capital development is the capacity of not only enabling live group interaction, but also continuous access to relevant (potentially 'life saving') information and instant access to a supportive network:

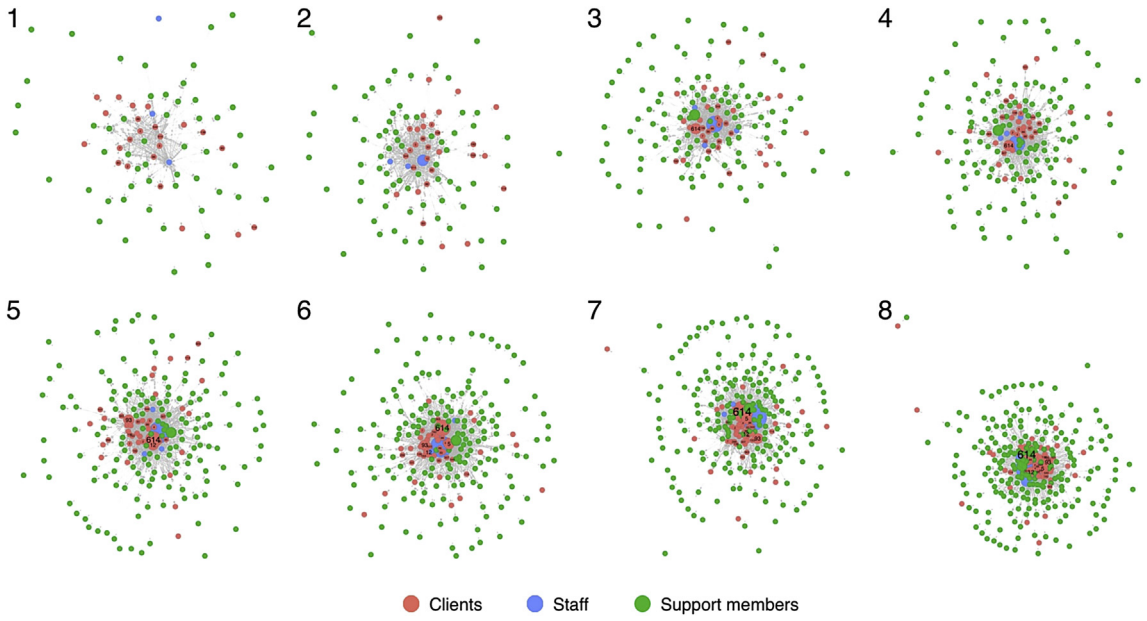

Fig. 1. Configurations of the online social network from months 1–8 showing significant movement from periphery to centre for members 93 and 614 (i.e., the interview participants).

Extract 3: "(the group) is not just 9–5; it continues - you get on with each other and you do the messaging to support – it's about looking after each other whether you are in work or not … (I) use it 24/7 - even during the day, it's like information at your finger-tips."

Extract 4: "(…) It is a support page but it also puts information out there. It is a support network - I am friends with everyone in JFH who has a Facebook account (…). You get a lot of support - people recognise if you are not on, it is good because you can interact with a lot of people quicker."

3.3.2. *Bridging capital: reaching to the wider community*

Bridging capital in the context of recovery refers to those resources that are built based on linkages with outgroup members, or the wider community in our case. Based on the interview data, being part of an online recovery community helps build bridging recovery capital through being able to *access wider* support which in turn further helps group members to create a sense of hope in their recovery success:

Extract 5: "(…) what excites me more is when other people comment. It just gives me a really good feeling. (…) It shows the support from the people who are out there. (…) It's like the ripple effect - instead of parents writing off their children, they are starting to have some sense of hope."

The opportunity to reach to the wider community as a key resource to support recovery is also mentioned:

Extract 6: "It's like the wider community coming in. (…) It's about the recovery community getting in touch with the wider community - and it's important that it is about the wider community and them understanding - like that incident with the woman [reference to an incident when several members of the groups intervened and saved a woman in a domestic incident]".

3.3.3. *Recovery social identity*

According to theories of addiction that draw on SIT, developing a strong recovery identity is likely to enable a sustainable, long-term recovery journey. Therefore, the analysis of the interview data sought to uncover themes around identity development, and found that both interviews highlighted the importance of visibility of identity change as a way of helping others in their recovery:

Extract 7: "You will go out your way if you need to bring other people on board (…) a lot of guys, it has given them hope. A lot of people are touched through addiction, and now they can see that there is hope. They are looking at them differently and they can see that there is hope. (…) Really important (to be seen as successful); we are visible - we can recover and we can deal with everyday stuff - without individuals to show that it does work, it wouldn't seem the same … Where you are now and where you were two years ago …"

The visibility of being part of JFH (a positively valued social identity) comes with a sense of pride in this identity that further helps development and maintenance of the recovery identity:

Extract 8: "Positive things - there was not one bad thing - we are trying to do our best - public see it as a really good thing, Withnell Road [reference to an open day at a property that JFH had developed on Withnell Road in Blackpool that elicited considerable positive feedback] - built up relationships - turned people around (…) lot of guys, it has given them hope. A lot of people are touched through addiction, and now they can see that there is hope. they are looking them differently and they can see that there is hope."

4. Discussion

The study contributes to the current understanding of group processes in addiction recovery by subjecting naturally occurring online data to SNA, standard statistical analyses, and computerised linguistic analysis. The online data are supplemented by two case

studies in which face-to-face in-depth key informant interviews bridge the gap between online activity and personal report and reflection on social networks. This mixed methods approach has allowed unique insights into how online social networking and social identity processes can affect retention in a recovery program. The study findings support the proposition that program retention is significantly determined by SNA centrality coefficients such as degree (the more central people are in the online network, the longer they stay in the program). This finding, in particular, highlights the importance of prototypicality in group engagement and the dynamic processes through which centrality and prototypicality are achieved.

Using computerised linguistic analysis, it was found that retention was not only significantly predicted by the pronoun "we" use (a social identity marker – the more they talk about 'we' the longer they stayed in the program), but also by the extent of affirmation or in-group validation – reflected in the number of comments and post 'likes' received (i.e., other people liked their post), comment 'likes' received, and all 'likes' received.

The focus on retention as the outcome variable in this study is based on evidence suggesting that not only recovery maintenance, but also thriving, are predicted by retention in recovery groups (Zhang et al., 2003). The design has provided us with a new method of measuring how group processes can impact upon retention with four aspects of network location and social interaction predictive:

a) being active in the network,
b) being central in the network,
c) being positive about belonging to the network, and
d) being endorsed by others for contributions to the network, as well as dynamic changes in these aspects.

These findings are entirely consistent with the two social identity models of recovery. SIMOR (Best et al., 2016) would suggest that the active participation and an increased sense of belonging to recovery groups are protective against involvement with using groups (and consequently relapse). Similarly, the social identity model of cessation maintenance (Frings and Albery, 2015), which focuses specifically on group processes and social identification in therapeutic settings and the wider community (including mutual aid groups), maintains that active identification with the group (as indicated in our study by the use of 'we' language) binds people to the group and to the resultant recovery values. It is important to note that while collective personal pronoun use ('we') is predictive of retention, individual personal pronoun ('I') was not, which implies that the salience of the group and the individuals' commitment and belonging are associated with greater endorsement by the group and longer engagement in it. The findings support the argument that developing a sense of collective selfhood (a positive recovery identity) helps the recovery process. The findings provide some support for the SIMOR model as linguistic analysis markers of group belonging and SNA indicators of group centrality were predictive of retention, suggesting that greater active identification with a recovery group and greater prototypicality with a recovery group is associated with longer retention in that group.

These findings were also in line with the qualitative results from two in-depth interviews (as a form of triangulation). The study design has allowed for mapping the underlying processes of group immersion - how the interview participants experienced it and why they valued it. By using a staged mixed-method approach, it was found that retention outcomes can be understood as a process of fostering social identity change that is also supportive of recovery capital development. That is, the study reveals that both the specific model of recovery community (build around participation and social engagement) and the use of technology enhanced positive recovery outcomes. Its findings explain how these two elements effected psychological change in the JFH participants as also evidenced in the qualitative reports of the two individuals who were selected for interviews because of their transition from the periphery to the centre of the group. Thus, there is a clear sense that the adoption of the values of the group, identifying oneself strongly with it, and being endorsed widely for one's contributions have a positive impact on centrality (and so influence over the group) and on the likelihood of enduring involvement with the group. These findings were also present in the narratives described in the case studies. For instance, the narratives highlight the importance of establishing positive identities and making the achievements associated with these identities visible in the broader community, which in turn supports recovery through creating a sense of pride and hope, and that may challenge exclusionary and stigmatising attitudes and beliefs in the broader community.

The current results have important implications for recovery group participation, both face-to-face and online. To encourage new group members to engage effectively in recovery groups, it is critical that they are endorsed and supported to feel that they are part of the group and that their contributions to the group are acknowledged and valued. It would also imply that those whose views are not endorsed and supported by other group members are more likely to become peripheral and as a result to drop out of the recovery group. What is clear from the findings is that this transition from the periphery to the centre of a social network (and the reverse) is a gradual process and that there may be opportunities for group coordinators to identify and prevent drop-out from groups through endorsement and support for group identification, and including and assertively engaging new members of the network.

4.1. Limitations of the research and future directions

The study findings are based on an in-depth case-study of intragroup dynamics in a specific recovery community, therefore they are not meant to be extrapolated to other groups and populations and no inferences can be drawn about the prevalence of the relationships observed beyond JFH. Further research should be conducted to replicate the methodology and approach in other recovery communities, and assess outcomes of different approaches based on comparisons between different communities (with different approaches to recovery). While retention is recognised in specialist addiction treatment services as a proxy indicator of outcomes, it is an assumption that the same is true of online recovery groups, and the impact will need further testing with prospective outcome analysis including a more diverse range of indicators (e.g., levels of recent substance use/abstinence, well-being measures, etc.). Only two case studies that include findings derived from in-depth interviews of group members who undertook significant changes in their position in the online social network (reflecting a positive recovery journey) are included. A broader and more diverse sample would have been ideal; however, including participants with less positive trajectories would have raised ethical issues around linking data from open social media sites with personal data. Further examination of other individuals who moved from the centre to the periphery of the online network (in other online communities) represents another research option that needs to be explored in future studies. Finally, more research is needed to identify the socio-economic and individual factors that facilitate or hinder the engagement with online forums.

5. Conclusions

This study has used a mixed methods approach to study the

changes that take place in real time in a recovery community that are underpinned by processes of social networking, social identity and recovery capital development. Its findings clearly establish that online engagement represents an effective way of supporting the process of recovery through three key factors that determine retention in the recovery program. These factors relate commitment to a group that is supportive of recovery and to endorsement by other members of this group. The study provides a basis for further research to examine group dynamics using online naturally occurring data to assess a combination of 'fit' with the values of the group and the resulting affirmation by fellow group members for the possibility of interventions to prevent drop-out by peripheral members of recovery communities.

Research ethics

Full approval was obtained on the 16th of May 2016 from the Sheffield Hallam University (SHU) Ethics Committee; the reference for the SHU ethics committee (Faculty of Development and Society) is AM/KW/D&S-241.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.socscimed.2017.09.050.

References

Baddeley, J.L., Pennebaker, J.W., Beevers, C.G., 2013. Everyday social behavior during a major depressive episode. Soc. Psychol. Pers. Sci. 4, 445–452.
Best, D., Beckwith, M., Haslam, C., Alexander Haslam, S., 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). Addict. Res. Theory. 24, 111–123.
Best, D., Laudet, A., 2010. The Potential of Recovery Capital. Royal Society for the Arts, London.
Best, D., 2016. An unlikely hero? : challenging stigma through community engagement. Drugs alc. Today. 16, 106–116.
Braun, Virginia, Clarke, V., 2006. Using thematic analysis in psychology. Qual. Res. Psychol. 2, 77–101.
Chung, J.E., 2013. Social interaction in online support groups: preference for online social interaction over offline social interaction. Comp. Hum. Beh. 29, 1408–1414.
Chung, C.K., Pennebaker, J.W., 2014. Counting Little Words in Big Data: the Psychology of Communities, Culture, and History. Social Cognition and Communication. Psychology Press, New York, pp. 25–42.
Cloud, W., Granfield, R., 2008. Conceptualizing recovery capital: expansion of a theoretical construct. Subst. Use Misuse 43, 1971–1986.
Cruwys, T., Dingle, G.A., Haslam, C., Haslam, S.A., Jetten, J., Morton, T.A., 2013. Social group memberships protect against future depression, alleviate depression symptoms and prevent depression relapse. Soc. Sci. Med. 98, 179–186.
Cruwys, T., Haslam, S.A., Dingle, G.A., Haslam, C., Jetten, J., 2014. Depression and social identity an integrative review. Pers. Soc. Psychol. Rev. 18, 215–238.
Denscombe, M., 2008. Communities of practice a research paradigm for the mixed methods approach. J. Mix. Meth. Res. 2, 270–283.
Emerson, R.M., 1976. Social exchange theory. Ann. Rev. Soc. 2, 335–362.
Finfgeld, D.L., 2000. Therapeutic groups online: the good, the bad, and the unknown. Issues Ment. Health Nurs. 21, 241–255.
Frings, D., Albery, I.P., 2015. The social identity model of cessation maintenance: formulation and initial evidence. Addict. Behav. 44, 35–42.
Gill, A.J., French, R.M., Gergle, D., Oberlander, J., 2008. The language of emotion in short blog texts. In: Proceedings of the 2008 ACM Conference on Computer Supported Cooperative Work. ACM, pp. 299–302.
Gossop, M., Marsden, J., Stewart, D., Treacy, S., 2001. Outcomes after methadone maintenance and methadone reduction treatments: two-year follow-up results from the National Treatment Outcome Research Study. Drug Alcohol Depend. 62, 255–264.
Groshkova, T., Best, D., White, W., 2013. The assessment of recovery capital: properties and psychometrics of a measure of addiction recovery strengths. Drug Alcohol Rev. 32, 187–194.
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. Soc. Sci. Med. 120, 57–66.
Hobbs, W.R., Burke, M., Christakis, N.A., Fowler, J.H., 2016. Online social integration is associated with reduced mortality risk. Proc. Natl. Acad. Sci. U. S. A. 113, 12980–12984.
Jetten, J., Haslam, C., Haslam, S.A., 2012. The Social Cure: Identity, Health and Well-being. Psychology Press, Hove, England.
Kaskutas, L.A., Bond, J., Humphreys, K., 2002. Social networks as mediators of the effect of alcoholics anonymous. Addict 97, 891–900.
Kavanaugh, A.L., Patterson, S.J., 2001. The impact of community computer networks on social capital and community involvement. Am. Behav. Sci. 45, 496–509.
Kelly, J.F., 2016. Is Alcoholics Anonymous religious, spiritual, neither? Findings from 25 years of mechanisms of behavior change research. Addict 6, 929–936.
Kelly, J.F., Hoeppner, B., Stout, R.L., Pagano, M., 2012. Determining the relative importance of the mechanisms of behavior change within Alcoholics Anonymous: a multiple mediator analysis. Addict 107, 289–299.
Kelly, J.F., Magill, M., Stout, R.L., 2009. How do people recover from alcohol dependence? A systematic review of the research on mechanisms of behavior change in alcoholics anonymous. Addict. Res. Theory 17, 236–259.
Litt, M.D., Kadden, R.M., Kabela-Cormier, E., Petry, N.M., 2009. Changing network support for drinking: network support project 2-year follow-up. J. Consult. Clin. Psychol. 77, 229–242.
Longabaugh, R., Wirtz, P.W., Zweben, A., Stout, R.L., 1998. Network support for drinking, alcoholics anonymous and long-term matching effects. Addict 93, 1313–1333.
Longabaugh, R., Wirtz, P.W., Zywiak, W.H., O'Malley, S.S., 2010. Network support as a prognostic indicator of drinking outcomes: the combine study*. J. Stud. Alcohol Drugs. 71, 837–846.
Lowe, R.D., Heim, D., Chung, C.K., Duffy, J.C., Davies, J.B., Pennebaker, J.W., 2013. In verbis, vinum? Relating themes in an open-ended writing task to alcohol behaviors. Appetite 68, 8–13.
Moorhead, S.A., Hazlett, D.E., Harrison, L., Carroll, J.K., Irwin, A., Hoving, C., 2013. A new dimension of health care: systematic review of the uses, benefits, and limitations of social media for health communication. J. Med. Internet Res. 15, e85.
Pennebaker, J.W., 2011. The Secret Life of Pronouns: what Our Words Say about Us. Bloomsbury Press, New York.
Pennebaker, J.W., Boyd, R.L., Jordan, K., Blackburn, K., 2015. The Development and Psychometric Properties of LIWC2015. UT Faculty/Researcher Works.
Pennebaker, J.W., Booth, R.J., Francis, M.E., 2007. Linguistic Inquiry and Word Count: LIWC [Computer Software]. Austin, TX: (liwc. net).
Pope, C., Ziebland, S., Mays, N., 2000. Analysing qualitative data. BMJ 320, 114–116.
Putnam, R., 2001. Social capital: measurement and consequences. Can. J. Policy Res. 2, 41–51.
Rodham, K., McCabe, C., Blake, D., 2009. Seeking support: an interpretative phenomenological analysis of an Internet message board for people with complex regional pain syndrome. Psychol. Health 24, 619–634.
Rude, S., Gortner, E.M., Pennebaker, J., 2004. Language use of depressed and depression-vulnerable college students. Cogn. Emot. 18, 1121–1133.
Savic, M., Best, D., Rodda, S., Lubman, D.I., 2013. Exploring the focus and experiences of smartphone applications for addiction recovery. J. Addict. Dis. 32, 310–319.
Scott, J., 2012. Social Network Analysis, third ed. Sage, London.
Shahab, L., McEwen, A., 2009. Online support for smoking cessation: a systematic review of the literature. Addict 104, 1792–1804.
Shneiderman, B., 2008. Copernican challenges face those who suggest that collaboration, not computation are the driving energy for socio-technical systems that characterize Web 2.0. Sci 319, 1349–1350.
Simpson, D.D., Sells, S.B., 1990. Opioid Addiction and Treatment: a 12-year Follow-up. Krieger Publishing Company, Malabar, Florida.
Stirman, S.W., Pennebaker, J.W., 2001. Word use in the poetry of suicidal and nonsuicidal poets. Psychosom. Med. 63, 517–522.
Turner, J.C., Hogg, M.A., Oakes, P.J., Reicher, S.D., Wetherell, M.S., 1987. Rediscovering the Social Group: a Self-categorization Theory. Basil Blackwell, London.
Turner, J.C., 1982. Towards a cognitive redefinition of the social group. In: Tajfel, H. (Ed.), Social Identity and Inter- Group Relations. Cambridge University Press, Cambridge, pp. 15–40.
Wetherell, C., Plakans, A., Wellman, B., 1994. Social networks, kinship, and community in Eastern Europe. J. Interdiscipl. Hist. 24, 639–663.
White, M., Dorman, S.M., 2001. Receiving social support online: implications for health education. Health Ed. Res. 16, 693–707.
White, W.L., Kelly, J.F., 2010. Recovery management: what if we really believed that addiction was a chronic disorder? In: Kelly, J.F., White, W. (Eds.), Addiction Recovery Management. Humana Press, New York, pp. 67–84.
Zhang, Z., Friedmann, P.D., Gerstein, D.R., 2003. Does retention matter? Treatment duration and improvement in drug use. Addict 98, 673–684.