Direct and indirect associations between dysfunctional attitudes, self-stigma, hopefulness and social inclusion in young people experiencing psychosis

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Title: Direct and indirect associations between dysfunctional attitudes, self-stigma, hopefulness and social inclusion in young people experiencing psychosis

Abstract

Objective: Social inclusion and vocational activity are central to personal recovery for young people with psychosis. Studies with people experiencing long term psychosis suggest negative self-beliefs are important, but less is known about whether this association is present for young service users or about the potential influence of positive self-beliefs such as hopefulness. The aim of the current paper was to investigate the direct and indirect associations between dysfunctional attitudes, self-stigma, hopefulness, social inclusion and vocational activity for young people with psychosis.

Method: A 5-month longitudinal study was conducted with young psychosis service users. Measures of dysfunctional attitudes and self-stigma and vocational activity were obtained at baseline. Measures of hopefulness, social inclusion and vocational activity were obtained at follow-up.

Results: Hopefulness mediates the associations between self-stigma, social inclusion and vocational activity. Self-stigma may have a greater influence on social inclusion with age. Dysfunctional attitudes do not significantly predict social inclusion or change in vocational activity status.

Conclusion: Findings suggest that the impact of self-stigma may extend beyond social and occupational withdrawal and undermine subjective community belonging. Findings encourage an increased emphasis on facilitating hopefulness for young people who experience psychosis.

Keywords Psychosis; Social inclusion; Psychosis; Self stigma; Hope
1. Introduction

Psychosis commonly first occurs in adolescence or early adulthood and can disrupt the negotiation of developmental social and occupational tasks (Dudley et al., 2014; Erikson, 1968; Iarocci et al., 2008; Roy et al., 2013). Smaller social networks, reduced employment, education and voluntary occupations, and more passive compared to active leisure pursuits (Hodgekins et al., 2015; Shimitras et al., 2003; Macdonald et al., 2000; Revier et al., 2015) have been observed in psychosis. Thus young people with psychosis may lack social inclusion (Connell et al., 2015); the engagement in normative social and occupational activities coupled with subjective belonging and mattering (Lam et al., 2011; Eisenstadt et al., 2012; Priebe, 2007). Social inclusion is considered part of the process of personal recovery, helping to facilitate psychological adaptation (Brenneman & Lobo, 2011). Both objective and subjective indices matter, for increased objective activity not coupled with subjective belonging can reduce wellbeing (Corrigan & Buican 1995; Hall 2010). Social inclusion is not synonymous with full-time paid employment for this is not necessarily possible or desired by everyone experiencing
psychosis (Priebe, 2007), and broader occupational, social and leisure activities also
indicate recovery (Fowler et al., 2009). Mainstream vocational activity may however
facilitate belonging (Rinaldi et al., 2010) and thus remains an important outcome.

Neurocognition, social cognition and psychosis symptoms influence social and
occupational outcomes, but also leave significant variance unexplained (Couture et al.,
2006; Green et al., 2000; Holshausen et al., 2014; Nuechterlein et al., 2011; Rinaldi et
al., 2010). Thus clarity is needed as to additional explanatory variables. Beliefs about
the self may be an important factor. Cognitive models suggest that neurocognitive
problems give rise to dysfunctional attitudes, i.e. over-concern with failure and rejection
(Beck et al., 1983; Beck et al., 2009). These attitudes provoke amotivation and
anhedonia (negative symptoms), in turn leading to social and vocational disengagement
(Grant & Beck, 2008; Beck et al., 2009; Horan et al., 2010). Similarly, self-stigma, the
internalisation of negative societal stereotypes, leads to social and occupational
withdrawal through provoking an emotional-behavioural ‘why try’ effect (Corrigan et
al., 2009; Yanos et al., 2010). Like dysfunctional attitudes, self-stigma is linked to
neurocognition and early symptoms (Beck et al., 2009; Livingston & Boyd, 2010), thus
may be present at psychosis onset.

Empirical studies support the impact of dysfunctional attitudes and self-stigma
on functioning in older schizophrenia populations (Brohan et al., 2010; Grant & Beck,
2008; Horan et al., 2010). Research with younger people is limited, yet age may
moderate the impact of such beliefs. As negative self-beliefs are more normative in
adolescence and cognitive maturity is reduced (D’Alessandro & Burton, 2006;
Lewinsohn et al., 2001; Meiser & Esser, 2017), it can be hypothesised that the impact of
these beliefs is reduced amongst younger people. However, equally an unclear self-
concept could make self-stigma more impactful in youth (Yang et al., 2010).
Conversely hopefulness, self-agency and perceived pathways to meet goals (Snyder et al., 2002), is thought to facilitate social inclusion and personal recovery in psychosis (Berry & Greenwood, 2015; Hicks et al., 2012; Perry et al., 2007). Hopefulness within specific life domains, e.g. work and social, may be particularly relevant to social inclusion and malleable to intervention (Snyder et al., 2002). Hopefulness may also be a key mechanism by which negative self-beliefs affect outcome; the ‘why try’ effect of self-stigma can be conceptualised as reduced hopefulness, i.e. diminished belief in one’s abilities and opportunities to achieve life goals (Corrigan et al., 2009). However, there has been limited attention to the combined impact of negative and positive self-beliefs in clinical psychology research (Wood & Tarrier, 2010). Further exploration of the roles of both negative and positive self-beliefs in predicting social inclusion and vocational activity has clear relevance to the foci of youth psychosis interventions.

1.1 Hypotheses

It was hypothesised that first, dysfunctional attitudes and self-stigma would be negatively associated with social inclusion and vocational activity, secondly, the association with dysfunctional attitudes would be mediated by negative symptoms, thirdly, hopefulness would mediate the association between self-stigma, social inclusion and vocational activity, and finally, age would moderate associations between self-beliefs and social inclusion.

2. Methods

A convenience sample was assessed at two time-points. Negative self-beliefs, vocational activity, neurocognition and symptoms were measured at baseline.
Hopefulness, social inclusion and a second assessment of vocational activity were measured 5 months later.

2.1 Participants and procedure

Young outpatient service users (18-36 years) with first episode psychosis (FEP), or a diagnosis of schizophrenia, schizoaffective disorder, puerperal psychosis, or bipolar disorder with psychosis, were recruited from Early Intervention in Psychosis, Community Mental Health and Assertive Outreach services (Table 1). Exclusion criteria were lack of capacity for informed consent or primary diagnosis of drug or alcohol dependence or drug-induced psychosis. Professionals first approached their clients and asked for consent to be contacted by the researcher, and if given, referred the participant to the study. Confirmed FEP, or diagnosis where relevant, was obtained from the treating psychiatrist or as documented in medical notes. Capacity was assessed by the first author prior to taking written consent. Additional methodological details relating to a linked study have been reported previously (Berry & Greenwood, 2015). Participants provided written informed consent before participating in face-to-face assessments in NHS or community locations. Ethical approval was obtained from the Brighton East NHS Research Ethics Committee (10/H1107/58). Assessments were conducted by the first author in 1-3 sessions within 1 week at each time-point.

2.2 Measures

2.2.1 Dysfunctional attitudes.

The 25 Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978) items are scored from 1 (totally agree) to 7 (totally disagree). Two subscales are derived, defeatist performance beliefs (e.g. “If I fail at my work, then I am a failure as a person”) and
need for approval (e.g. “I cannot be happy unless most people I know admire me”); with confirmed reliability in psychosis (Horan et al., 2010). Means for defeatist performance (15 items; α= .90) and need for approval (10 items; α= .85) subscales were used presently; with higher scores reflecting greater negative self-beliefs.

2.2.2 Self-stigma.

Self-stigma was measured using the Internalized Stigma of Mental Illness Scale (ISMI; Ritsher et al., 2003) which has 29 items rated from 1 (strongly disagree) to 4 (strongly agree), for example, “People discriminate against me because I have a mental illness”. The ISMI achieved high internal consistency (α= .90) with people experiencing serious mental health problems including psychosis (Ritsher et al., 2003). A mean score across the alienation, stereotype endorsement, discrimination experience, and social withdrawal subscales was used (α= .92), as the fifth subscale, stigma resistance, represents not self-stigma but rather a reaction to it (Lysaker et al., 2008). Higher scores represent greater self-stigma.

2.2.3 Hopefulness

Hope across academic, work, social, family, romantic, and leisure life domains was captured using the Domain-Specific Hope Scale (DSHS; Symposon, 1999). Respondents rated eight items in each life area, for example, “I can always get a date if I set my mind to it” (romantic hope) from 1 (definitely false) to 8 (definitely true). Excellent internal reliability (α= .93) was achieved with young people previously (Symposon, 1999). Currently a mean for all 48 items was used (α= .97), with higher scores reflecting greater hopefulness.
2.2.4 Social inclusion

Based on a new social inclusion measurement model in young people (Berry & Greenwood, submitted), social inclusion comprised mean composite scores for two domains; social activity ($\alpha = .72$) and community belonging ($\alpha = .71$). Social activity comprised indicators of social network size and reciprocity and social contact. Social network size and reciprocity were measured using the Social Relationship Scale (SRS; McFarlane et al., 1981) capturing number of relationships and their reciprocity across work, home and family, money, personal health, personal and social, and society. Social contact was measured using three items from the Social Inclusion Scale (SIS; Secker et al., 2009), for example “I have friends I see or talk to every week”, rated from 1 (not at all) to 4 (yes definitely) for the last month. Community belonging comprised items from the SIS representing cultural inclusion (e.g. “I have been to new places”; 3 items), political inclusion (“I have felt clear about my rights”; 2 items), and subjective belonging (“I feel that what I do is valued by others”; 3 items).

2.2.5 Vocational activity

Following Norman and colleagues (2007), employment (paid and voluntary) and education were included in ‘vocational activity’. Vocational activity was measured as a self-reported status (yes or no), with ‘yes’ indicating regular vocational activity in the month preceding the assessment.

2.2.6 Covariates

2.2.6.1 Clinical symptoms.

The observer-rated Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987) was used to measure positive (7-items), negative (7-items), and general (16-items)
symptoms, from 1 (none) to 7 (most severe). The total PANSS score (range 30-210) was used except for hypotheses where the negative symptom total (range 7-49) was relevant.

### 2.2.6.2 Neurocognition

A composite neurocognition score was captured across premorbid intelligence (National Adult Reading Test (NART; Nelson, 1982)), working memory (Letter Number Sequencing subtest from the Wechsler Memory Scale (WMS; Wechsler et al., 1981)), verbal memory (immediate and delayed Logical Memory subtests (WMS; Wechsler et al., 1981), and verbal fluency (Controlled Oral Word Association Test (COWAT; Benton & Hamsher, 1983) and Category Instances (Tombaugh et al., 1999)). Domain scores were z-transformed using population means and standard deviations (Wechsler, 1981; Nelson & Willison, 1991; Tombaugh et al., 1999) and averaged, with higher scores reflecting better neurocognition.

### 2.3 Analysis

Correlations were computed to assess bivariate relationships between variables and regression models computed to facilitate including covariates. Mediation models were constructed for indirect effects. Regression and mediation models were tested in Mplus (version 6.0; Muthén & Muthén, 1998-2010) using Full Information Maximum Likelihood methods for missing data (Johnson & Young, 2011). Models were first assessed using Maximum Likelihood Robust (MLR) estimation, recomputed with bootstrapping (Maximum Likelihood estimation; 5000 resamples) to assess indirect effects (Preacher & Hayes, 2008), and then adjusted for covariates.
The binary vocational activity outcome required mean and variance-adjusted
Weighted Least Squares (WLSMV) estimation, resulting in probit coefficients
interpreted as per linear regression coefficient effect sizes (Lee et al., 2007), i.e. .1 =
small, .3 = moderate, and .5 = large (Cohen, 1992). Explained variance ($R^2$) was similarly
interpreted; .01 = small, .09 = medium, and .25 = large (Cohen, 1998). Reverse models
were tested to establish whether reverse direction effects could be discounted (Kline,
2011). Moderation was tested with product terms and examined using interaction plots
(Little et al., 2007).

3. Results

Fifty-one participants participated at baseline and follow up 5 months later (range= 3-7
months, $M_{weeks}$=20.72, SD= 4.87). Follow-up duration was not associated with age,
ethnicity, duration of service use, clinical symptoms, or change to vocational status. Our
sample is demographically and clinically comparable with a non-overlapping sample
recruited from the same services (Davies et al., 2016).

Missing data was minimal (Table 1) at either 0 or 2% missing and 8% for
neurocognition. Data were deemed missing at random due to no substantive patterns in
missingness according to demographic or study variables. No multivariate outliers
(Mahalanobis distance $p< .0001$) were detected and scatterplots supported linearity of
associations.

INSERT TABLE 1 HERE.

3.1 Associations between dysfunctional attitudes, social inclusion and vocational
activity.
Vocational activity at baseline and follow-up were moderately associated ($rs=.43, p<.002$), with 29.4% ($n=15$) of participants changing status during follow-up (Table 1).

Dysfunctional attitudes did not correlate with social inclusion (social activity and community belonging; see Table 2), nor with negative symptoms at baseline ($r=.12, p=.43$ and $r=-.14, p=.35$ respectively) or follow-up ($r=.10, p=.52$ and $r=-.04, p=.80$ respectively) suggesting dysfunctional attitudes do not predict social inclusion in this sample directly or indirectly through negative symptoms.

Greater defeatist performance beliefs unexpectedly correlated with being in vocational activity at baseline, and greater need for approval with vocational activity at follow-up (Table 2). To explore the robustness of these associations, regression models were constructed to control for covariates; defeatist performance beliefs predicted baseline vocational activity when adjusted for neurocognition and baseline symptoms ($\beta=.47, b=.45, p=.01$) but need for approval no longer significantly predicted vocational activity at follow-up ($\beta=.26, b=.26, p=.11$). Thus, greater defeatist performance beliefs are significantly associated with concurrent vocational activity.

3.2 Direct and indirect associations between self-stigma, hopefulness, social inclusion and vocational activity.

Self-stigma and hopefulness correlated significantly with social inclusion and hopefulness correlated with vocational activity at follow-up (Table 2). Mediation models were constructed to test whether these associations were mediated by hopefulness. The sample size (N=51) allowed for computing models with 10 free
parameters (Kline, 2011), thus models were constructed separately for social activity, community belonging and vocational activity at follow-up. The vocational activity model controlled for baseline status, thus testing predictors of change in vocational activity.

These models (Table 3) suggest self-stigma significantly predicts reduced social inclusion (social activity and community belonging) and vocational activity directly and indirectly through reduced hopefulness. The indirect coefficients are larger than the direct, although all associations are small. According to $R^2$ values, self-stigma explains a medium-sized amount of variance in hopefulness, and together with reduced hopefulness, a large amount of variance in social activity, community belonging and vocational activity. Figure 1 depicts the mediation model for self-stigma predicting community belonging through hopefulness.

**Fig.1.** Mediation of the association between self-stigma and community belonging through hopefulness. *Notes: a = predictor (x) to mediator (m) path coefficient, b=m to outcome (y), c=total effect, c’=direct effect. Italicised letters represent standardised path coefficients.***p< .001, **p< .01, *p< .05’.*

Controlling for covariates (neurocognition, baseline and follow-up symptoms, baseline and follow-up antipsychotic medication) did not alter model parameters; except
when controlling for follow-up symptoms, indirect associations from self-stigma through hopefulness were rendered non-significant in the social activity ($ab = -0.08$, $ab = -0.08$, 95% CI [-.22, .00]) and community belonging models ($ab = -0.13$, $ab = -0.28$, 95% CI [-.65, .02]). In these models, symptoms, which covaried highly with self-stigma, more robustly predicted hopefulness. Reverse models, reversing the mediator (hopefulness) and outcome (social activity, community belonging, or vocational activity), resulted in indirect effects (social activity ($ab = -0.10$, $ab = -0.42$, 95% CI [-.46, -.24]), community belonging ($ab = -0.24$, $ab = -0.53$, 95% CI [-.94, -.23]), vocational activity ($ab = -0.02$, $ab = --0.04$, 95% CI [-.29, .15])) which were smaller than the hypothesised models or non-significant and were rejected.

3.3 Moderation of associations between self-beliefs and social inclusion by age.

Continuous age*self-belief interactions were modelled as predictors of social inclusion. Age significantly moderated the association between self-stigma and social activity ($\beta = -0.22$, $b = -0.04$, $p = .03$) and community belonging ($\beta = -0.24$, $b = -0.10$, $p = .03$).

These interactions were plotted using M±1 SD for age and self-stigma (Figure 2) and suggested self-stigma predicts a greater reduction in social activity and community belonging when people are older. Covarying total duration of service use, baseline and follow-up symptoms did not alter any parameters.

Fig. 2. Interaction between service users’ age and self-stigma in their prediction of social activity and community belonging. Notes: M±1 SD for age labelled as younger and older. M±1 SD for self-stigma labelled as low and high. Social activity and community belonging are z scores represented in SD units on the y axes.
4. Discussion

The main finding of this study is that greater self-stigma is associated with reduced social inclusion and vocational activity, and this association is mediated by reduced hopefulness. Therefore, the impact of self-stigma may extend to the nuanced subjective experience of community belonging. The mediation model supports hopefulness as a potentially important mechanism of the self-stigma ‘why try’ effect (Corrigan et al., 2009), with the present indirect effect being larger than the direct effect. However, both high self-stigma and high clinical symptoms may override hopefulness’ contribution to outcome. Additionally, although larger the direct effect, the small indirect effect size also points toward potential other ‘why try’ mechanisms, for example, self-esteem (Corrigan et al., 2009). The self-stigma and social inclusion association is larger as people age, irrespective of service use duration; thus supporting a greater impact of self-stigma beyond childhood and adolescence perhaps due to increased cognitive maturity (Meiser & Esser, 2017) or through entrenchment.

Dysfunctional attitudes did not predict social inclusion directly or through negative symptoms. This challenges the relevance of dysfunctional attitude and functional outcome models in older populations (Grant & Beck, 2008; Horan et al., 2010) to younger people. Nevertheless, this study should be replicated with a more comprehensive negative symptom measure than the PANSS, as dysfunctional attitudes may have correlated with items more clearly reflecting vocational involvement. Defeatist performance beliefs were however higher in the presence of concurrent vocational activity. It could be that young service users engaged in, especially paid mainstream, vocational activity are more aware of neurocognitive problems which provokes the emergence of defeatist performance beliefs (Beck et al., 2009); yet these
beliefs have not yet accumulated sufficiently to cause vocational withdrawal (Beck &
Rector, 2005). In youth, dysfunctional attitudes may impact less due to reduced
cognitive maturity or because these beliefs are more normative, and perhaps must reach
a critical value before impact is observable (Abela & Hankin 2008; Meiser & Esser,
2017). Nevertheless, studies of dysfunctional attitudes in younger psychosis populations
remain rare and further research is needed (Campellone et al., 2016). It may also be that
the greater female presence in the current sample, compared to the wider psychosis
literature, suppressed a larger impact of dysfunctional attitudes commonly found in
males (Campellone et al., 2016).

Important caveats must be borne in mind. The absence of a research diagnostic
assessment is a limitation. The convenience sampling method and diagnostic
heterogeneity of the sample may have introduced bias; although we did test our
mediation models excluding participants with bipolar disorder or puerperal psychosis
and found no change. Our quasi-longitudinal approach and the concurrent measurement
of hopefulness and social inclusion means that, despite some support from reverse
models for hypothesised directions of effects, reciprocal and reverse effects should be
further considered. Such reciprocal effects are in keeping with a personal recovery
framework (e.g. Brennaman & Lobo, 2011). Additionally, although adequate to test
current models, the sample size may have prevented detection of small direct effects
(Rucker et al., 2011). Finally, the dichotomous vocational activity measurement is
limited. Although qualities of community contribution and belonging are captured in
social inclusion, a more comprehensive vocational activity measure, such as time spent
in paid, voluntary employment and education (Hodgekins et al., 2015), would be
valuable. Additionally, most participants did not change vocational activity status
during the study, thus replication with a longer follow-up period is warranted. A further
study limitation is the absence of social cognition as a predictor of social inclusion and of information regarding use of psychological interventions which could conceivably influence outcomes. Finally, despite our individual capabilities approach, structural factors, such as parental relationships and the economic climate, will inevitably influence social inclusion, self-stigma and the ‘why try’ effect. We encourage further study of the social and societal context.

Limitations withstanding, this study suggests the impact of self-stigma on social and occupational outcomes may extend to undermining subjective community belonging and mattering. Self-stigma seems more robustly related to social inclusion and vocational activity than dysfunctional attitudes implicated in functioning in older populations. Furthermore, this study empirically supports the importance of hopefulness to social inclusion and vocational activity and current findings reinforce the emerging greater therapeutic focus on raising young service users’ hopefulness and positive self-beliefs in CBT in psychosis (Nelson et al., 2009; Fowler et al., 2013; Freeman et al., 2014; Hodgekins & Fowler, 2010).

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Table 1. Sample characteristics and descriptive statistics (N= 51).

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<tr>
<th>Sample characteristic</th>
<th>Frequency</th>
<th>Mean</th>
<th>Study variable</th>
<th>N</th>
<th>Maximum range</th>
<th>Frequency</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>M (SD)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Age (years)</td>
<td>26.12 (5.59)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Male</td>
<td>30 (58.8%)</td>
<td></td>
<td>Defeatist performance beliefs</td>
<td>50</td>
<td>(1-7)</td>
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<td>3.06 (1.10)</td>
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<td>Ethnicity</td>
<td></td>
<td></td>
<td>Need for approval</td>
<td>50</td>
<td>(1-7)</td>
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<td>4.07 (1.19)</td>
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<td>White British</td>
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<td>Self-stigma</td>
<td>50</td>
<td>(1-4)</td>
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<td>2.18 (.47)</td>
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<tr>
<td>White Other</td>
<td>3 (5.9%)</td>
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<td>Hopefulness</td>
<td>51</td>
<td>(1-8)</td>
<td></td>
<td>5.58 (1.07)</td>
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<td>African</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Mixed</td>
<td>4 (7.8%)</td>
<td></td>
<td>Social activitya</td>
<td>50</td>
<td></td>
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<td>.01 (.74)</td>
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<tr>
<td>Other Asian</td>
<td>2 (3.9%)</td>
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<td>Social network size</td>
<td>50</td>
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<td>19.02 (10.38)</td>
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<tr>
<td>Duration of service use</td>
<td>35.88 (42.61)/</td>
<td>Median= 24</td>
<td>Social network reciprocity</td>
<td>50</td>
<td>(0-5)</td>
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<td>3.73 (.92)</td>
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<tr>
<td>Diagnosis/ Presenting problem</td>
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<td></td>
<td>Social contact</td>
<td>51</td>
<td></td>
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<td>3.43 (.68)</td>
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Note: aSocial activity includes social activity and social network size.
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<th>Diagnosis</th>
<th>Count (%)</th>
<th>Community belonging$^a$</th>
<th>Cultural inclusion</th>
<th>Political inclusion</th>
<th>Belonging and meaningful occupation</th>
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<tr>
<td>First episode psychosis</td>
<td>31 (60.8%)</td>
<td>-0.00 (.74)</td>
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<tr>
<td>Schizophrenia</td>
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<td>2.67 (.94)</td>
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<tr>
<td>Schizoaffective disorder</td>
<td>4 (7.8%)</td>
<td>3.21 (.74)</td>
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<tr>
<td>Bipolar disorder</td>
<td>4 (7.8%)</td>
<td>2.88 (.88)</td>
<td></td>
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<tr>
<td>Puerperal psychosis</td>
<td>1 (2%)</td>
<td></td>
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<tr>
<td>Puerperal psychosis</td>
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### Vocational activity

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<th>51</th>
<th>Baseline vocational activity</th>
<th>26 (51.0%)</th>
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<tr>
<td>Follow-up vocational activity</td>
<td>33 (64.7%)</td>
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### Change in vocational activity

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<tr>
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<th>51</th>
<th>Started vocational activity</th>
<th>11 (21.6%)</th>
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<tr>
<td>Stopped vocational activity</td>
<td>4 (7.8%)</td>
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<tr>
<td>No change</td>
<td>36 (70.6%)</td>
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### Total baseline clinical symptoms

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<th>51</th>
<th>(30-210)</th>
<th>55.98 (12.67)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive symptoms</td>
<td>11.98 (4.29)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative symptoms</td>
<td>13.67 (4.29)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General symptoms</td>
<td>30.33 (6.96)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Running head: Self-beliefs, social inclusion & psychosis

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total follow-up clinical symptoms</strong></td>
<td>50 (30-210)</td>
</tr>
<tr>
<td>Positive symptoms</td>
<td>12.58 (4.34)</td>
</tr>
<tr>
<td>Negative symptoms</td>
<td>11.42 (4.60)</td>
</tr>
<tr>
<td>General symptoms</td>
<td>28.96 (7.81)</td>
</tr>
<tr>
<td><strong>Baseline antipsychotic medication</strong></td>
<td>279.09 (334.31)</td>
</tr>
<tr>
<td><strong>Follow-up antipsychotic medication</strong></td>
<td>235.95 (326.26)</td>
</tr>
<tr>
<td><strong>Neurocognitive functioning</strong></td>
<td>47</td>
</tr>
<tr>
<td>Logical Memory Immediate Recall</td>
<td>32.98 (11.69)</td>
</tr>
<tr>
<td>(Raw /Scaled)</td>
<td>7.84 (3.16)</td>
</tr>
<tr>
<td>Logical Memory Delayed Recall</td>
<td>19.96 (8.95)</td>
</tr>
<tr>
<td>(Raw /Scaled)</td>
<td>8.49 (3.34)</td>
</tr>
<tr>
<td>National Adult Reading Test</td>
<td>26.53 (8.10)</td>
</tr>
<tr>
<td>Test</td>
<td>N</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>----</td>
</tr>
<tr>
<td>Controlled Oral Word Association (F, A, S)</td>
<td>48</td>
</tr>
<tr>
<td>Letter Number Sequencing</td>
<td>47</td>
</tr>
<tr>
<td>Category Instances (Animals)</td>
<td>47</td>
</tr>
</tbody>
</table>

*aScores are mean averages of multiple z scored variables.*
Table 2. Bivariate correlations.

<table>
<thead>
<tr>
<th></th>
<th>DP</th>
<th>NA</th>
<th>SS</th>
<th>H</th>
<th>SA</th>
<th>CB</th>
<th>VAB</th>
<th>VAF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Negative self-beliefs</strong></td>
<td></td>
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<tr>
<td>Defeatist performance beliefs (DP)</td>
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<tr>
<td>Need for approval (NA)</td>
<td>.64***</td>
<td>1</td>
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<tr>
<td>Self-stigma (SS)</td>
<td>.71***</td>
<td>.61***</td>
<td>1</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hopefulness (H)</strong></td>
<td>-.21</td>
<td>-.15</td>
<td>-.43**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social inclusion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social activity (SA)</td>
<td>-.08</td>
<td>.05</td>
<td>-.31*</td>
<td>.43**</td>
<td>1</td>
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<td></td>
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<tr>
<td>Community belonging (CB)</td>
<td>-.27</td>
<td>-.17</td>
<td>-.41**</td>
<td>.66***</td>
<td>.32*</td>
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<tr>
<td>Service users’ vocational activity at baseline(a) (VAB)</td>
<td>.35*</td>
<td>.10</td>
<td>.05</td>
<td>.24</td>
<td>.14</td>
<td>.12</td>
<td>1</td>
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<tr>
<td>Service users’ vocational activity at follow-up(a) (VAF)</td>
<td>.17</td>
<td>.30*</td>
<td>-.00</td>
<td>.44**</td>
<td>.31*</td>
<td>.47**</td>
<td>.43**</td>
<td>1</td>
</tr>
</tbody>
</table>

*** p< .001, ** p< .01, * p< .05. \(a\)Correlations between vocational activity and all other variables are Spearman’s Rho correlations, remainder are Pearson’s r.
Table 3. Mediation models of the associations between self-stigma and outcome (social activity, community belonging and vocational activity) through hopefulness.

<table>
<thead>
<tr>
<th>Outcome (y)</th>
<th>Predictor (x)</th>
<th>Mediator (m)</th>
<th>Total effect (c) (c, c)</th>
<th>Direct effect (c') (c', c')</th>
<th>Indirect effect (ab) (ab, ab [95% CI])</th>
<th>$R^2_m$</th>
<th>$R^2_y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social activity(^a)</td>
<td>Self-stigma</td>
<td>Hopefulness</td>
<td>-.31 (-.30^{**})</td>
<td>-.15 (-.14)</td>
<td>-.22 (-.16 [-.31, -.07])</td>
<td>.18</td>
<td>.21</td>
</tr>
<tr>
<td>Community belonging(^a)</td>
<td>Self-stigma</td>
<td>Hopefulness</td>
<td>-.40 (-.86^{**})</td>
<td>-.15 (-.32)</td>
<td>-.25 (-.54 [-.98, -.26])</td>
<td>.18</td>
<td>.45</td>
</tr>
<tr>
<td>Vocational activity(^b)</td>
<td>Self-stigma</td>
<td>Hopefulness</td>
<td>-.07 (-.17)</td>
<td>.17 (.44)</td>
<td>-.25 (-.61 [-1.04, -.28])</td>
<td>.22</td>
<td>.47</td>
</tr>
</tbody>
</table>

Notes: \(* * * p<.001, ** p<.01, * p<.05. c=total effect, c'=direct effect, ab= indirect effect. Italicised letters represent standardised path coefficients. \(^a\)p values for a, c, and c’ paths computed using MLR estimation, 95% bias-corrected bootstrapped confidence intervals (BBCIs) computed in separate models using ML estimation. \(^b\)p values for a, b, c, c’ paths and 95% confidence intervals computed using Mean and Variance adjusted Weighted Least Squares (WLSMV) estimation. 95% BBCIs which do not contain 0 suggest significant mediation.