

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

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

3 **Abstract**

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

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

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

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

24 **Keywords** Psychosis; Social inclusion; Psychosis; Self stigma; Hope

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43 **1. Introduction**

44 Psychosis commonly first occurs in adolescence or early adulthood and can
45 disrupt the negotiation of developmental social and occupational tasks (Dudley et al.,
46 2014; Erikson, 1968; Iarocci et al., 2008; Roy et al., 2013). Smaller social networks,
47 reduced employment, education and voluntary occupations, and more passive compared
48 to active leisure pursuits (Hodgekins et al., 2015; Shimitras et al., 2003; Macdonald et
49 al., 2000; Revier et al., 2015) have been observed in psychosis. Thus young people with
50 psychosis may lack social inclusion (Connell et al., 2015); the engagement in normative
51 social and occupational activities coupled with subjective belonging and mattering
52 (Lam et al., 2011; Eisenstadt et al., 2012; Priebe, 2007). Social inclusion is considered
53 part of the process of personal recovery, helping to facilitate psychological adaptation
54 (Brennaman & Lobo, 2011). Both objective and subjective indices matter, for increased
55 objective activity not coupled with subjective belonging can reduce wellbeing (Corrigan
56 & Buican 1995; Hall 2010). Social inclusion is not synonymous with full-time paid
57 employment for this is not necessarily possible or desired by everyone experiencing

58 psychosis (Priebe, 2007), and broader occupational, social and leisure activities also
59 indicate recovery (Fowler et al., 2009). Mainstream vocational activity may however
60 facilitate belonging (Rinaldi et al., 2010) and thus remains an important outcome.

61 Neurocognition, social cognition and psychosis symptoms influence social and
62 occupational outcomes, but also leave significant variance unexplained (Couture et al.,
63 2006; Green et al., 2000; Holshausen et al., 2014; Nuechterlein et al., 2011; Rinaldi et
64 al., 2010). Thus clarity is needed as to additional explanatory variables. Beliefs about
65 the self may be an important factor. Cognitive models suggest that neurocognitive
66 problems give rise to dysfunctional attitudes, i.e. over-concern with failure and rejection
67 (Beck et al., 1983; Beck et al., 2009). These attitudes provoke amotivation and
68 anhedonia (negative symptoms), in turn leading to social and vocational disengagement
69 (Grant & Beck, 2008; Beck et al., 2009; Horan et al., 2010). Similarly, self-stigma, the
70 internalisation of negative societal stereotypes, leads to social and occupational
71 withdrawal through provoking an emotional-behavioural ‘why try’ effect (Corrigan et
72 al., 2009; Yanos et al., 2010). Like dysfunctional attitudes, self-stigma is linked to
73 neurocognition and early symptoms (Beck et al., 2009; Livingston & Boyd, 2010), thus
74 may be present at psychosis onset.

75 Empirical studies support the impact of dysfunctional attitudes and self-stigma
76 on functioning in older schizophrenia populations (Brohan et al., 2010; Grant & Beck,
77 2008; Horan et al., 2010). Research with younger people is limited, yet age may
78 moderate the impact of such beliefs. As negative self-beliefs are more normative in
79 adolescence and cognitive maturity is reduced (D’Alessandro & Burton, 2006;
80 Lewinsohn et al., 2001; Meiser & Esser, 2017), it can be hypothesised that the impact of
81 these beliefs is reduced amongst younger people. However, equally an unclear self-
82 concept could make self-stigma more impactful in youth (Yang et al., 2010).

83 Conversely hopefulness, self-agency and perceived pathways to meet goals
84 (Snyder et al., 2002), is thought to facilitate social inclusion and personal recovery in
85 psychosis (Berry & Greenwood, 2015; Hicks et al., 2012; Perry et al., 2007).
86 Hopefulness within specific life domains, e.g. work and social, may be particularly
87 relevant to social inclusion and malleable to intervention (Snyder et al., 2002).
88 Hopefulness may also be a key mechanism by which negative self-beliefs affect
89 outcome; the ‘why try’ effect of self-stigma can be conceptualised as reduced
90 hopefulness, i.e. diminished belief in one’s abilities and opportunities to achieve life
91 goals (Corrigan et al., 2009). However, there has been limited attention to the
92 combined impact of negative and positive self-beliefs in clinical psychology research
93 (Wood & Tarrier, 2010). Further exploration of the roles of both negative and positive
94 self-beliefs in predicting social inclusion and vocational activity has clear relevance to
95 the foci of youth psychosis interventions.

96

97 **1.1 Hypotheses**

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

104

105 **2. Methods**

106 A convenience sample was assessed at two time-points. Negative self-beliefs,
107 vocational activity, neurocognition and symptoms were measured at baseline.

108 Hopefulness, social inclusion and a second assessment of vocational activity were
109 measured 5 months later.

110

111 ***2.1 Participants and procedure***

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

127

128 ***2.2 Measures***

129 ***2.2.1 Dysfunctional attitudes.***

130 The 25 Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978) items are scored
131 from 1 (totally agree) to 7 (totally disagree). Two subscales are derived, defeatist
132 performance beliefs (e.g. “If I fail at my work, then I am a failure as a person”) and

133 need for approval (e.g. “I cannot be happy unless most people I know admire me”); with
134 confirmed reliability in psychosis (Horan et al., 2010). Means for defeatist performance
135 (15 items; $\alpha = .90$) and need for approval (10 items; $\alpha = .85$) subscales were used
136 presently; with higher scores reflecting greater negative self-beliefs.

137

138 *2.2.2 Self-stigma.*

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

148

149 *2.2.3 Hopefulness*

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

157

158 *2.2.4 Social inclusion*

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

172

173 *2.2.5 Vocational activity*

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

178

179 *2.2.6 Covariates*

180 *2.2.6.1 Clinical symptoms.*

181 The observer-rated Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987)
182 was used to measure positive (7-items), negative (7-items), and general (16-items)

183 symptoms, from 1 (none) to 7 (most severe). The total PANSS score (range 30-210)
184 was used except for hypotheses where the negative symptom total (range 7-49) was
185 relevant.

186

187 *2.2.6.2 Neurocognition.*

188 A composite neurocognition score was captured across premorbid intelligence (National
189 Adult Reading Test (NART; Nelson, 1982), working memory (Letter Number
190 Sequencing subtest from the Wechsler Memory Scale (WMS; Wechsler et al., 1981)),
191 verbal memory (immediate and delayed Logical Memory subtests (WMS; Wechsler et
192 al., 1981)), and verbal fluency (Controlled Oral Word Association Test (COWAT;
193 Benton & Hamsher, 1983) and Category Instances (Tombaugh et al., 1999)). Domain
194 scores were z-transformed using population means and standard deviations (Wechsler,
195 1981; Nelson & Willison, 1991; Tombaugh et al., 1999) and averaged, with higher
196 scores reflecting better neurocognition.

197

198 **2.3 Analysis**

199 Correlations were computed to assess bivariate relationships between variables
200 and regression models computed to facilitate including covariates. Mediation models
201 were constructed for indirect effects. Regression and mediation models were tested in
202 Mplus (version 6.0; Muthén & Muthén, 1998-2010) using Full Information Maximum
203 Likelihood methods for missing data (Johnson & Young, 2011). Models were first
204 assessed using Maximum Likelihood Robust (MLR) estimation, recomputed with
205 bootstrapping (Maximum Likelihood estimation; 5000 resamples) to assess indirect
206 effects (Preacher & Hayes, 2008), and then adjusted for covariates.

207 The binary vocational activity outcome required mean and variance-adjusted
208 Weighted Least Squares (WLSMV) estimation, resulting in probit coefficients
209 interpreted as per linear regression coefficient effect sizes (Lee et al., 2007), i.e. .1=
210 small, .3= moderate, and .5= large (Cohen, 1992). Explained variance (R^2) was similarly
211 interpreted; .01= small, .09= medium, and .25= large (Cohen, 1998). Reverse models
212 were tested to establish whether reverse direction effects could be discounted (Kline,
213 2011). Moderation was tested with product terms and examined using interaction plots
214 (Little et al., 2007).

215

216 **3. Results**

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

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

227

228 INSERT TABLE 1 HERE.

229

230 ***3.1 Associations between dysfunctional attitudes, social inclusion and vocational***
231 ***activity.***

232 Vocational activity at baseline and follow-up were moderately associated ($r_s=.43$, $p<$
233 $.002$), with 29.4% ($n= 15$) of participants changing status during follow-up (Table 1).
234 Dysfunctional attitudes did not correlate with social inclusion (social activity and
235 community belonging; see Table 2), nor with negative symptoms at baseline ($r= .12$, $p=$
236 $.43$ and $r= -.14$, $p= .35$ respectively) or follow-up ($r= .10$, $p= .52$ and $r= -.04$, $p= .80$
237 respectively) suggesting dysfunctional attitudes do not predict social inclusion in this
238 sample directly or indirectly through negative symptoms.

239

240 INSERT TABLE 2 HERE.

241

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

250

251 ***3.2 Direct and indirect associations between self-stigma, hopefulness, social inclusion***
252 ***and vocational activity.***

253 Self-stigma and hopefulness correlated significantly with social inclusion and
254 hopefulness correlated with vocational activity at follow-up (Table 2). Mediation
255 models were constructed to test whether these associations were mediated by
256 hopefulness. The sample size ($N= 51$) allowed for computing models with 10 free

257 parameters (Kline, 2011), thus models were constructed separately for social activity,
258 community belonging and vocational activity at follow-up. The vocational activity
259 model controlled for baseline status, thus testing predictors of change in vocational
260 activity.

261

262 INSERT TABLE 3 HERE.

263

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

272

273 INSERT FIGURE 1 HERE

274

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

279

280 Controlling for covariates (neurocognition, baseline and follow-up symptoms,
281 baseline and follow-up antipsychotic medication) did not alter model parameters; except

282 when controlling for follow-up symptoms, indirect associations from self-stigma
283 through hopefulness were rendered non-significant in the social activity ($ab = -.08$, $ab = -$
284 $.08$, 95% CI $[-.22, .00]$) and community belonging models ($ab = -.13$, $ab = -.28$, 95% CI
285 $[-.65, .02]$). In these models, symptoms, which covaried highly with self-stigma, more
286 robustly predicted hopefulness. Reverse models, reversing the mediator (hopefulness)
287 and outcome (social activity, community belonging, or vocational activity), resulted in
288 indirect effects (social activity ($ab = -.10$, $ab = -.42$, 95% CI $[-.46, -.24]$), community
289 belonging ($ab = -.24$, $ab = -.53$, 95% CI $[-.94, -.23]$), vocational activity ($ab = -.02$, $ab = --$
290 $.04$, 95% CI $[-.29, .15]$)) which were smaller than the hypothesised models or non-
291 significant and were rejected.

292

293 ***3.3 Moderation of associations between self-beliefs and social inclusion by age.***

294 Continuous age**self-belief* interactions were modelled as predictors of social
295 inclusion. Age significantly moderated the association between self-stigma and social
296 activity ($\beta = -.22$, $b = -.04$, $p = .03$) and community belonging ($\beta = -.24$, $b = -.10$, $p = .03$).
297 These interactions were plotted using $M \pm 1$ SD for age and self-stigma (Figure 2) and
298 suggested self-stigma predicts a greater reduction in social activity and community
299 belonging when people are older. Covarying total duration of service use, baseline and
300 follow-up symptoms did not alter any parameters.

301

302 INSERT FIGURE 2 HERE

303 **Fig. 2.** Interaction between service users' age and self-stigma in their prediction of
304 social activity and community belonging. *Notes: $M \pm 1$ SD for age labelled as younger*
305 *and older. $M \pm 1$ SD for self-stigma labelled as low and high. Social activity and*
306 *community belonging are z scores represented in SD units on the y axes.*

307

308 **4. Discussion**

309 The main finding of this study is that greater self-stigma is associated with reduced
310 social inclusion and vocational activity, and this association is mediated by reduced
311 hopefulness. Therefore, the impact of self-stigma may extend to the nuanced subjective
312 experience of community belonging. The mediation model supports hopefulness as a
313 potentially important mechanism of the self-stigma ‘why try’ effect (Corrigan et al.,
314 2009), with the present indirect effect being larger than the direct effect. However, both
315 high self-stigma and high clinical symptoms may override hopefulness’ contribution to
316 outcome. Additionally, although larger the direct effect, the small indirect effect size
317 also points toward potential other ‘why try’ mechanisms, for example, self-esteem
318 (Corrigan et al., 2009). The self-stigma and social inclusion association is larger as
319 people age, irrespective of service use duration; thus supporting a greater impact of self-
320 stigma beyond childhood and adolescence perhaps due to increased cognitive maturity
321 (Meiser & Esser, 2017) or through entrenchment.

322 Dysfunctional attitudes did not predict social inclusion directly or through
323 negative symptoms. This challenges the relevance of dysfunctional attitude and
324 functional outcome models in older populations (Grant & Beck, 2008; Horan et al.,
325 2010) to younger people. Nevertheless, this study should be replicated with a more
326 comprehensive negative symptom measure than the PANSS, as dysfunctional attitudes
327 may have correlated with items more clearly reflecting vocational involvement.

328 Defeatist performance beliefs were however higher in the presence of concurrent
329 vocational activity. It could be that young service users engaged in, especially paid
330 mainstream, vocational activity are more aware of neurocognitive problems which
331 provokes the emergence of defeatist performance beliefs (Beck et al., 2009); yet these

332 beliefs have not yet accumulated sufficiently to cause vocational withdrawal (Beck &
333 Rector, 2005). In youth, dysfunctional attitudes may impact less due to reduced
334 cognitive maturity or because these beliefs are more normative, and perhaps must reach
335 a critical value before impact is observable (Abela & Hankin 2008; Meiser & Esser,
336 2017). Nevertheless, studies of dysfunctional attitudes in younger psychosis populations
337 remain rare and further research is needed (Campellone et al., 2016). It may also be that
338 the greater female presence in the current sample, compared to the wider psychosis
339 literature, suppressed a larger impact of dysfunctional attitudes commonly found in
340 males (Campellone et al., 2016).

341 Important caveats must be borne in mind. The absence of a research diagnostic
342 assessment is a limitation. The convenience sampling method and diagnostic
343 heterogeneity of the sample may have introduced bias; although we did test our
344 mediation models excluding participants with bipolar disorder or puerperal psychosis
345 and found no change. Our quasi-longitudinal approach and the concurrent measurement
346 of hopefulness and social inclusion means that, despite some support from reverse
347 models for hypothesised directions of effects, reciprocal and reverse effects should be
348 further considered. Such reciprocal effects are in keeping with a personal recovery
349 framework (e.g. Brennaman & Lobo, 2011). Additionally, although adequate to test
350 current models, the sample size may have prevented detection of small direct effects
351 (Rucker et al., 2011). Finally, the dichotomous vocational activity measurement is
352 limited. Although qualities of community contribution and belonging are captured in
353 social inclusion, a more comprehensive vocational activity measure, such as time spent
354 in paid, voluntary employment and education (Hodgekins et al., 2015), would be
355 valuable. Additionally, most participants did not change vocational activity status
356 during the study, thus replication with a longer follow-up period is warranted. A further

357 study limitation is the absence of social cognition as a predictor of social inclusion
358 (Couture et al., 2006; Fett et al., 2011) and of information regarding use of
359 psychological interventions which could conceivably influence outcomes. Finally,
360 despite our individual capabilities approach, structural factors, such as parental
361 relationships and the economic climate, will inevitably influence social inclusion, self-
362 stigma and the 'why try' effect. We encourage further study of the social and societal
363 context.

364 Limitations withstanding, this study suggests the impact of self-stigma on social
365 and occupational outcomes may extend to undermining subjective community
366 belonging and mattering. Self-stigma seems more robustly related to social inclusion
367 and vocational activity than dysfunctional attitudes implicated in functioning in older
368 populations. Furthermore, this study empirically supports the importance of hopefulness
369 to social inclusion and vocational activity and current findings reinforce the emerging
370 greater therapeutic focus on raising young service users' hopefulness and positive self-
371 beliefs in CBT in psychosis (Nelson et al., 2009; Fowler et al., 2013; Freeman et al.,
372 2014; Hodgekins & Fowler, 2010).

373

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

Sample characteristic	Frequency n (%)	Mean <i>M (SD)</i>	Study variable	N	Maximum range	Frequency (%)	Mean <i>M (SD)</i>
Age (years)		26.12 (5.59)	<i>Negative self-beliefs</i>				
Male	30 (58.8%)		Defeatist performance beliefs	50	(1-7)		3.06 (1.10)
<i>Ethnicity</i>			Need for approval	50	(1-7)		4.07 (1.19)
White British	40 (78.4%)		Self-stigma	50	(1-4)		2.18 (.47)
White Other	3 (5.9%)		Hopefulness	51	(1-8)		5.58 (1.07)
African	2 (3.9%)		<i>Social inclusion</i>				
Mixed	4 (7.8%)		Social activity ^a	50			.01 (.74)
Other Asian	2 (3.9%)		Social network size	50	(0-)		19.02 (10.38)
Duration of service use (months)		35.88 (42.61)/ Median= 24	Social network reciprocity	50	(0-5)		3.73 (.92)
<i>Diagnosis/ Presenting problem</i>			Social contact	51			3.43 (.68)

Running head: Self-beliefs, social inclusion & psychosis

First episode psychosis	31 (60.8%)	Community belonging ^a		-0.00 (.74)
Schizophrenia	11 (21.6%)	Cultural inclusion	51 (1-4)	2.67 (.94)
Schizoaffective disorder	4 (7.8%)	Political inclusion	50 (1-4)	3.21 (.74)
Bipolar disorder	4 (7.8%)	Belonging and meaningful occupation	51 (1-4)	2.88 (.88)
Puerperal psychosis	1 (2%)	<i>Vocational activity</i>	51	
		Baseline vocational activity		26 (51.0%)
		Follow-up vocational activity		33 (64.7%)
		<i>Change in vocational activity</i>		
		Started vocational activity		11 (21.6%)
		Stopped vocational activity		4 (7.8%)
		No change		36 (70.6%)
		Total baseline clinical symptoms	51 (30-210)	55.98 (12.67)
		Positive symptoms		11.98 (4.29)
		Negative symptoms		13.67 (4.29)
		General symptoms		30.33 (6.96)

Total follow-up clinical symptoms	50	(30-210)	53.08 (13.17)
Positive symptoms			12.58 (4.34)
Negative symptoms			11.42 (4.60)
General symptoms			28.96 (7.81)
Baseline antipsychotic medication			279.09
(Chlorpromazine Equivalent Units in			(334.31)
grams)			
Follow-up antipsychotic medication			235.95
(Chlorpromazine Equivalent Units in			(326.26)
grams)			
Neurocognitive functioning ^a	47		-.33 (.86)
Logical Memory Immediate Recall	50	(0-75 /1-19)	32.98 (11.69)
(Raw /Scaled)			/7.84 (3.16)
Logical Memory Delayed Recall	49	(0-50 /1-19)	19.96 (8.95)
(Raw /Scaled)			/8.49 (3.34)
National Adult Reading Test	49	(0-50)	26.53 (8.10)

Controlled Oral Word Association Test (F, A, S)	48	(0-)	34.73 (15.16)
Letter Number Sequencing	47	(0-21)	9.60 (2.88)
Category Instances (Animals)	47	(0-)	18.72 (6.99)

^aScores are mean averages of multiple z scored variables.

Table 2. Bivariate correlations.

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

*** $p < .001$, ** $p < .01$, * $p < .05$. ^aCorrelations 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.

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

Notes: *** $p < .001$, ** $p < .01$, * $p < .05$. c=total effect, c'=direct effect, ab= indirect effect. Italicised letters represent standardised path coefficients. ^ap values for a, b, c, and c' paths computed using MLR estimation, 95% bias-corrected bootstrapped confidence intervals (BBCIs) computed in separate models using ML estimation. ^bp 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.