Occupational functioning in early non-affective psychosis: the role of attributional biases, symptoms and executive functioning

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Aims. Occupational functioning is severely impaired in people with psychosis. Social cognition has recently been found to be a stronger predictor of functioning than neurocognition. This study is the first to investigate if externalizing attributional biases that are typically associated with psychosis play a role in the vocational pathways of people with early psychosis.

Methods. A cross-sectional design was used. Fifty participants with early psychosis were recruited from a cohort of 144 participants of the Lambeth Early Onset randomized control trial at 18-month follow-up. Information on occupational functioning was obtained using case notes and interview. Severity of symptoms was assessed and participants completed measures on attributional style and executive functioning.

Results. Although executive functioning and positive symptoms were associated with poor occupational functioning, an externalizing attributional style for failures and reduced engagement in occupational activities during the previous 18 months emerged as the only predictors of poor occupational functioning at 18-month follow-up.

Conclusions. An externalizing attributional bias is associated with poor occupational functioning. Further research is needed to investigate the direction of this relationship and whether attributional biases mediate the impact of symptoms and cognitive impairment on functioning.

Introduction

The educational and occupational prospects for young people experiencing their first episode of psychosis are poor even after initial symptomatic remission. Completing education and finding employment is a key component of recovery. Impaired neurocognition is thought to play an important role in limiting these occupational outcomes (Green *et al.* 2000) but a recent meta-analysis showed that social cognition, particularly theory of mind (ToM), which refers to the capacity to represent one's own and others' mental states (Baron-Cohen, 1995; Brüne & Brüne-Cohrs, 2006), is a stronger predictor of community functioning than neurocognition (Fett *et al.* 2011). It is less clear if social cognition plays a similar role in functional outcome in early psychosis, as research with this group is scarce (Allott *et al.* 2011), but emerging data suggest that aspects of social cognition, such as facial affect recognition and social perception, are associated with social functioning independently of general cognition (Addington *et al.* 2006*a*, *b*; Williams *et al.* 2008).

Attributional style has been a relatively neglected aspect of social cognition when investigating functional outcome (Fett *et al.* 2011; Mancuso *et al.* 2011). An externalizing attribution bias for negative events has been associated with psychosis (Fear *et al.* 1996; Sharp *et al.* 1997; Janssen *et al.* 2006; Jolley *et al.* 2006), and a specific tendency to blame others has been linked to persecutory delusions (Bentall *et al.* 2001; Combs *et al.* 2009; Fornells-Ambrojo & Garety, 2009*a*). That attributional style may also influence occupational outcomes is suggested by Weiner's theory of achievement motivation (Weiner, 1986). This theory suggests that causal attributions of success and failure determine expectations and subsequent behaviour, so that attributing failure to one's own

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behaviour (e.g., factors such as personal effort) rather than to the uncontrollable actions of external agencies is associated with approaching rather than avoiding future challenges and by implication, greater success in overcoming obstacles.

The only study that has investigated the predictive value of attributional style in relation to neurocognition in work functioning in psychosis failed to find an association (Mancuso *et al.* 2011). This non-significant result could be explained by the choice of attribution measure in the study, the Ambiguous Intentions Hostility Questionnaire (AIHQ; Combs *et al.* 2007), that was specifically developed to investigate paranoia and therefore measures over-attribution of hostile intentions to others, blame and aggression, but does not assess locus of attribution (internal–external), one of the identified dimensions in Weiner's attributional theory.

Locus of Control (LoC; Rotter, 1966; Rotter, 1990), a related construct that refers to the extent to which an individual generally perceives events to be a consequence of his or her actions (internal control) or external forces such as fate, chance or powerful others (e.g., 'This world is run by the few people in power, and there is not much the little guy can do about it') has been found to be associated with functional outcome in psychosis. Fisher *et al.* (2012) recently reported that an external LoC, alongside self-esteem, depression and anxiety, mediated the relationship between early adversity (harsh parenting, domestic violence, bullying) and psychosis-like symptoms in a large prospective longitudinal study. An external LoC was also associated with depression and predicted fewer periods of recovery, defined as symptomatic recovery and acceptable psycho-social functioning, in people with psychosis in a 15-year prospective study (Harrow *et al.* 2009). Similarly, Hoffmann *et al.* (2000) found that poor rehabilitation outcome in schizophrenia was predicted by an external LoC, a passive coping style and depression.

The current study aims to investigate for the first time if the externalizing attributional bias that has been associated with psychosis plays a role in the real-life occupational functioning of people with early psychosis. In line with the above studies, the role of neurocognition – relative to social cognition – will be investigated. Allot *et al.* recent systematic review (Allott *et al.* 2011) concluded that 'reasoning and problem solving' is one of the domains that most consistently predicts functional outcome in early psychosis.

The current study aimed to test the following hypotheses in relation to participation in occupational activity in people with early non-affective psychosis:

(a) Poor occupational activity will be associated with an external attributional style for negative events and this relationship will not be accounted for by depression or paranoia.

(b) Poor participation in occupational activity will be predicted by a concurrent externalizing attributional style for failures, negative symptoms of psychosis and poor executive functioning.

Method

Design and procedure

A cross-sectional design was used to examine whether attributional style was associated with current occupational functioning. The participants for the study were derived from a cohort of 144 participants of a randomized controlled trial (ISRCTN 73679874) that examined the effectiveness of a specialist service (Lambeth Early Onset, LEO) for people with early non-affective psychosis (Craig *et al.* 2004).

The LEO service is a multidisciplinary community team established on the principles of assertive outreach. One of the programme's main goals is to help clients retain or recover functional capacity in the vocational domain (Craig *et al.* 2004; Garety *et al.* 2006). The vocational intervention followed the principles outlined by the Early Psychosis Prevention and Intervention Centre (EPPIC) early intervention service (EPPIC, 1997; Edwards & McGorry, 2002). Other evidence-based interventions included low-dose antipsychotic medication and cognitive behaviour therapy (CBT) (Fowler *et al.* 1995). The comparison services in the LEO randomized controlled trial were community mental health teams. These teams typically include an occupational therapist. Although these teams had not received specific training in early psychosis, they were encouraged to follow best practice guidelines (EPPIC, 1997; Aitchison *et al.* 1999).

Inclusion criteria for the LEO study included presenting to mental health services for the first time with non-affective psychosis (F20-29, Schizophrenia, Schizoaffective and Delusional Disorders; World Health Organization, 1992). In addition, people who had presented once previously but had immediately disengaged without treatment from routine mental health services were also deemed eligible. Exclusion criteria were organic psychosis and primary diagnosis of alcohol or drug addiction. All participants were living in the borough of Lambeth, London, the seventh most deprived of the 376 local authority boroughs in England and Wales at the time of recruitment (Department of Health, 2001).

Participants of the LEO trial completed a range of measures at both baseline and 18 months (Garety *et al.* 2006). Data from two measures assessing clinical state (positive and negative symptom scale (PANSS) by

Kay *et al.* 1987; and Calgary Depression Rating Scale, by Addington *et al.* 1993) are reported in the current study. Information collected from clinical case note files on symptoms, social functioning, treatment and recovery pattern (Bebbington *et al.* 2006) during the 18-month period was also available from the LEO study.

For the current study, participants were invited to complete three additional measures at the 18-month LEO follow-up: achievement and relationships attribution task (ARAT; Fornells-Ambrojo & Garety, 2009*b*); Wisconsin Card Sorting Test-64 (WCST-64; Kongs *et al.* 2000) and a semi-structure interview assessing participants' vocational pathways during the previous 18-month period (Fig. 1).

As the current occupational study was conceived as an 'add-on' to the 18-month follow-up assessment, local ethics committee approval was sought for an amendment to the original LEO trial application (Ref. EC99/126) to include the three additional measures for the occupational study. Participants whose 18-month LEO follow-up was due after ethical approval for the amendment was granted in May 2002 until the end of the trial (April 2003[1]) were consecutively invited to take part in the current vocational study (see Fig. 2). All participants invited to complete the additional three measures gave informed consent for inclusion in the occupational study. Completion time for the LEO trial 18-month standard assessment and the additional measures for the current study was approximately 2 h and participants were given the option of completing the measures on two separate occasions.

Measures

LEO assessment at 18 months: symptom severity

Psychotic symptoms were measured by interview, using the PANSS (Kay *et al.* 1987), a 30-item, seven-point (1–7) rating instrument, with three composite subscales: positive, negative and general psychopathology. Symptoms of depression were assessed with the Calgary Depression Rating Scale (Addington *et al.* 1993), a nine-item scale, (range 0–27), specifically designed to assess depression in people with schizophrenia.

Additional measures

Achievement and Relationships Attribution Task (ARAT; Fornells-Ambrojo, 2009b)

The ARAT assesses individual preferences for three types of attributional loci: internal (oneself), external-

personal (another person) and external-situational (circumstantial). Participants' attributions for judgments on 12 scenarios (six positive and six negative events) depicting achievement and interpersonal events (e.g., you have trouble finding work, you get a pay rise) are summarized in six subscores. These subscores indicate the number of internal, external-personal and external-situational attributions that participants make for positive and negative events, respectively. The range of each of the subscores is 0–6. As the current study aims to investigate the role of the internal–external attribution distinction in occupational functioning, the two types of possible external attributions (another person or circumstances) are not considered separately for the purposes of this paper[2]. The number of external attributions for negative events [possible range 0–6] was calculated adding the number of external-person attributions for negative events and the number of external-situation attributions for negative events. The number of external attributions for positive events [possible range 0–6] was calculated adding the number of external-person attributions for positive events and the number of external-situation attributions for positive events.

The Wisconsin Card Sorting Test-64
(WCST-64; Kongs et al. 2000)

The WCST is a widely used neuropsychological measure of executive functioning in people with schizophrenia that assesses abstraction, set shifting, planning and flexibility. The original WCST and the WCST-64 provide similar results for clinical samples (Smith-Seemiller *et al.* 1997). A study specifically looking at people with schizophrenia found high correlations between WCST and WCST-64 scores (Robinson *et al.* 1991) Scoring for the WCST generates various indices, including the number of categories completed (possible range for the WCST-64 [0–6], perseverative responses and perseverative errors. For this study the number of perseverative errors was used. Perseverative errors refer to cards sorted according to a previous strategy even after the matching principle has been changed. A high number of perseverative errors represent difficulty in abstraction and low cognitive flexibility.

Occupational functioning

Given the fact that the first onset of psychosis occurs at a time when young people are completing education

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[1] The LEO trial 18-month interviews took place between July 2001 and April 2003.

[2] For studies looking at the role of personal-external attributions in the context of persecutory ideations please see (Fornells-Ambrojo & Garety, 2009*a*, *b*).
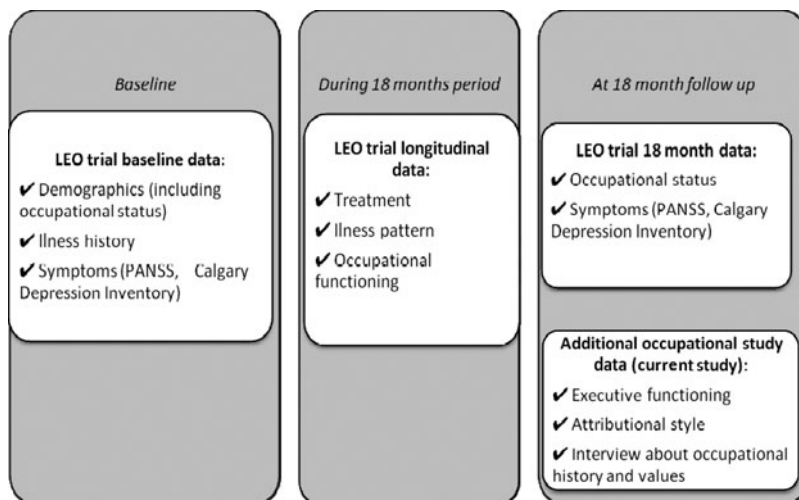
Fig. 1. Chart showing the baseline, 18 months longitudinal and 18-month data available for the current occupational study from the LEO trial (Craig *et al.* 2004; Garety *et al.* 2006) and additional measures specifically collected for the current study at the 18-month follow-up.

or are first entering the employment market, we defined occupational functioning as any participation in age-appropriate activity, including returning to complete educational courses, as well as employment.

Information on occupational functioning at 18-month follow-up was obtained from two sources. Firstly, demographic data and vocational status over each of the 18-month LEO trial periods were routinely collected
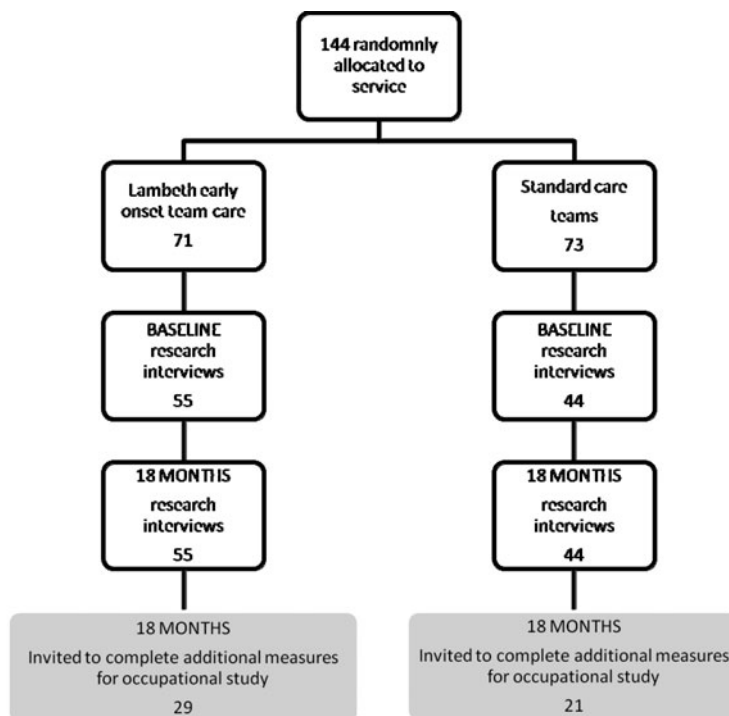

Fig. 2. Flow of participants for research interviews for the LEO randomized controlled trial (Craig *et al.* 2004; Garety *et al.* 2006) and current occupational study. See Garety *et al.* (2006) for full participant flow, including follow-up of case note records and reason for not being interviewed. *Note*: The LEO trial 18-month interviews took place between July 2001 and April 2003. Participants whose 18-month LEO follow-up was due after ethical approval for the amendment was granted in May 2002 and April 2003 were consecutively invited and agreed to take part in the current vocational study.

from clinical case notes to assess social recovery (Garety *et al.* 2006). Secondly, participants completed a semi-structured interview that provided more in depth information about the nature of each occupation.

Statistical analysis

Representativeness of the sample included in the current study was evaluated in relation to all participants included in the LEO trial and against those who completed measures at 18-month LEO follow-up but who were not invited to take part in the occupational study by χ^2 and *t*-tests. As the current study aimed to investigate the factors associated with poor occupational functioning at 18 months, the sample of 50 participants was divided into two groups, 'active' and 'inactive'. In order to control for the possible effects of demographics, illness characteristics and treatment variables on the 18-month occupational status, baseline and longitudinal variables available from the LEO trial were compared between members of the active and inactive groups at 18 months using χ^2 and *t*-tests. Active and inactive 18-month group differences were analysed using *t*-tests for concurrent executive functioning and symptoms, and analysis of covariance (ANCOVA) for concurrent attributional style using current depression and suspiciousness as covariates.

Lastly, variables that were significantly different between the active and inactive groups were entered into a hierarchical logistic regression to test the hypothesis that poor participation in occupational activity at 18 months would be predicted by a concurrent externalizing attributional style for failures, symptoms of psychosis and poor executive functioning, after controlling for baseline, treatment and longitudinal variables. Control variables were entered in block 1 and concurrent variables in block 2. An alpha 0.05 was chosen *a priori*. Statistical analyses were performed using SPSS.

Results

Participant representativeness

Fifty consecutively recruited participants took part in the current study (29 had been randomized to LEO, and 21 to treatment as usual, 18 months earlier). The demographics of the participants invited to take part in the occupational study ($n = 50$) (male = 32 (64%); White British Ethnicity = 16 (32%); mean age = 25.3 years (SD = 6.5)) did not differ from those of the rest of the participants in the LEO trial ($n = 94$) (male = 61 (65%), $\chi^2 = 0.11$, df = 1, $p = 0.915$; White British Ethnicity = 29 (31%), $\chi^2 = 0.20$, df = 1, $p = 0.887$; mean age = 26.81 years (SD = 5.9), $t_{142} = 1.44$, $p = 0.153$). There were also no significant differences in clinical

symptom measures between the 50 participants invited to the occupational study and the remaining 49 participants who completed the 18-month interview for the LEO trial (Garety *et al.* 2006), in terms of PANSS Total: Mean$_{\text{Occupational study}} = 51.65$ (SD = 13.36), Mean$_{\text{Non-occupational study}} = 56.62$ (SD = 15.89), $t_{97} = 1.69$, $p = 0.096$; Calgary Depression Scale: Mean$_{\text{Occupational study}} = 2.39$ (SD = 6.12), Mean$_{\text{Non-occupational study}} = 2.88$ (SD = 3.60) $t_{97} = 0.73$, $p = 0.469$, and the Global Assessment of Function: Mean$_{\text{Occupational study}} = 61.35$ (SD = 15.32), Mean$_{\text{Non-occupational study}} = 59.24$ (SD = 15.80), $t_{96} = 0.67$, $p = 0.505$.

Occupational activity

Occupational activity is defined as any kind of education and work, including full- and part-time occupation, whether in or out of the competitive market. At the time of the 18-month follow-up, when the current study took place, 22 (44%) participants were engaged in employment or educational activity (active group), whereas 28 (56%) were unemployed and were not attending any kind of education or training (inactive group). The active group ($n = 22$) included people in full-time competitive employment ($n = 3$), part-time competitive employment ($n = 4$), work in family business ($n = 5$), voluntary work ($n = 2$), full-time mainstream education ($n = 3$), part-time mainstream education ($n = 4$), and training supported by mental health services ($n = 1$).

The next three sections present baseline and longitudinal data from the LEO trial for the previous 18 months as well as information on occupational functioning over this period for the active and inactive groups.

Baseline characteristics of occupationally active and inactive participants at 18 months

Active participants at 18 months were more likely to have this occupational status at baseline than their inactive counterparts (see Table 1). There was also a non-significant trend for active participants to be in privately rented accommodation at baseline, whereas the inactive group was more likely to live in worse housing conditions (e.g., social housing,). The groups did not differ on baseline symptoms measures, duration of untreated psychosis or other demographic descriptive data.

Illness and treatment longitudinal data of occupationally active and inactive participants at 18 months

Table 2 shows that a higher proportion of participants in the active group had been randomized to receive the specialist service (LEO) at baseline, but this difference was not statistically significant. The active and inactive

Table 1. *Baseline characteristics of occupationally active and inactive at 18-month follow-up (Values are numbers (SD) unless stated otherwise)*

	Variables at baseline	Active at 18 m (n = 22)	Inactive at 18 m (n = 28)	Test	p
Demographics and functioning	Mean age (SD)	23.3 (5.8)	26.8 (6.8)	$t(48) = -1.9$	0.063
	Male gender	16 (73%)	16 (57%)	$\chi^2 (df = 1) = 1.3$	0.254
	Housing: privately owned or rented accommodation (v. in social housing, homeless or other)	12 (55%)	8 (29%)	$\chi^2 (df = 1) = 3.5$	0.063
	Education level: Secondary only	9 (41%)	11 (39%)	$\chi^2 (df = 1) = 0.0$	0.990
	Number of years of education post 16 at randomization	2.6 (3.3)	2.1 (3.3)	$t(48) = 0.5$	0.645
	Occupational activity at baseline total active (work or education)	14 (64%)	6 (21%)	$\chi^2 (df = 1) = 9.1$	0.002[a]*
Illness	*Duration of untreated psychosis (months)*				
	Mean (SD)	4.0 (5.0)	7.2 (9.3)	$U^a = 198.5$	0.575
	Median [Range]	3.0 [0.25–21]	2.5 [0.25–30]		
	First episode at baseline (v. 2nd episode)	17 (77%)	26 (93%)	$\chi^2 (df = 1) = 2.5$	0.217
	Schizophrenia diagnosis	18 (82%)	20 (67%)	$\chi^2 (df = 1) = 7.3$	0.393
	PANSS positive	19.4 (6.3)	18.4 (6.1)	$t(38) = 0.5$	0.615
	PANSS negative	14.6 (5.4)	20.1 (17.0)	$t(38) = -1.6$	0.128
	PANSS general psychopathology	36.7 (9.7)	36.6 (7.0)	$t(37) = 0.0$	0.960
	Calgary Depression Inventory	4.1 (2.7)	3.3 (2.9)	$t(38) = 0.6$	0. 546

PANSS, positive and negative syndrome scale.

[a]Mann–Whitney non-parametric test.

*$p < 0.01$.

groups received similar levels of mental health care in terms of number of appointments attended in the community, number of days spent in hospital and vocational support, which typically involved help filling out forms and writing a CV, attending college or work with the client for support meetings or a vocational assessment. A significantly higher proportion of participants in the active group had been offered psychological input during the 18-month period than in the inactive group (69% *v.* 36%).

The active and inactive groups did not significantly differ in terms of course of illness as evaluated by Bebbington *et al.* (2006) recovery and relapse criteria (see also Craig *et al.* 2004). Around 60% of participants in both groups recovered from the index episode and did not suffer a relapse during the follow-up period. There was, however, a non-significant trend for participants in the active group to have spent more months 'in recovery' in the previous 18 months than inactive participants.

Occupational activity during the previous 18 months

In order to check how representative the current occupational status at 18 months was of the 18-month period, the previous 18 months' occupational histories of the active and inactive groups were compared. Table 3 shows that participants in the active group spent more time involved in activities (work or education) than the inactive group during the previous 18 months. Attempts to obtain work often included looking in the newspaper, attending the local job centre or applying in shops and food chains that accepted 'walk-in' applications. The most common type of education was part-time courses, in particular computing and art-related courses. In terms of employment, the majority of people worked part-time in competitive jobs, mostly at food chains or supermarkets.

Concurrent executive functioning, symptoms and attributional style, by occupationally active or inactive at 18 months

Forty-eight participants completed the WCST-64 (Kongs *et al.* 2000). The mean number of categories completed was 2.2 (SD = 1.5, range 0–5), the mean number of perseverative errors was 14.7 (SD = 9.2, range 4–44) and the value for overall perseverative responses was 17.2 (SD = 11.8, range 4–58). Robinson *et al.* (1991) proposed

Table 2. *Contact with services and course of illness during previous 18 months by occupationally active and inactive at 18-month follow-up (values are numbers (SD) unless stated otherwise)*

		Active at 18 m (*n* = 22)	Inactive at 18 m (*n* = 28)	Test	*p*
Treatment	Allocated randomly at baseline to specialist care group (LEO)	15 (68%)	14 (50%)	χ^2 (df = 1) = 1.7	0.196
	Number of appointments attended at the community mental health team (outpatient appointments)	10.2 (8.8)	9.2 (6.5)	*t* (37) = 0.7	0.676
	Number of days in hospital during the 18-month period	73.6 (99.0)	82.7 (80.5)	*t* (48) = −0.4	0.722
	Psychological intervention during the 18-month period (CBT) = Yes	14 (64%)	10 (36%)	χ^2 (df = 1) = 3.9	0.050*
	Vocational intervention during the 18-month period (Yes)	15 (69%)	13 (46%)	χ^2 (df = 1) = 2.3	0.124
Course of illness	Better recovery/relapse course — Recovered from index episode and did not relapse during 18 months	13 (59%)	16 (57%)		
	Worse recovery/relapse course — One relapse after recovering from the index episode	9 (41%)	8 (29%)		
	Two relapses after recovering from the index episode	0 (0%)	2 (7%)		
	No recovery after index episode	0 (0%)	2 (7%)	χ^2 (df = 1) = 0.02	0.890#
	Months in recovery [0–18]	12.4 (4.7)	9.9 (5.7)	*t* (48) = 1.7	0.095

#Chi-square calculated for a 2 (active *v.* inactive) × 2 (better recovery/worse recovery course) (better recovery = recovered never relapsed; worse recovery course = recovered and had one or more relapses or never recovered) as 2 × 4 categories Chi-square would have not been valid as 4 cells had expected frequencies of less than 5.
*$p \leq 0.05$.

a cut-off for impairment on the WCST-64 score for perseverative responses ≥15. Applying this criteria, 27 out of forty-eight (56%) participants fell in the impaired range.

Table 4 shows that participants in the inactive group were more impaired in their executive functioning, as illustrated by the higher likelihood to make perseverative errors, as well as showing more severe positive symptoms of psychosis profile than the active group.

The groups did not differ on negative symptoms, depression or general symptomatology.

Is occupational activity associated with attributional style?

Overall, participants provided a range of explanations for events. Internal explanations for both positive

Table 3. *Involvement in occupational activity (work and education) during the 18-month period by active/inactive at 18 months*

Mean (SD)	Active at 18 m (*n* = 22)	Inactive at 18 m (*n* = 28)	Test	*p*
Hours in occupational activity	863.7 (775.7)	173.7 (4238.8)	*t* (48) = 4.5	<0.001*
Number in weeks in occupational activity [possible range 0–78 weeks]	38.7 (17.5)	14.1 (14.4)	*t* (48) = 5.4	<0.001*
Percentage of weeks engaged in occupational activity *while* an outpatient (not an inpatient in hospital)	58. 8% (24.1)	22.1% (22.5)	*t* (48) = 5.5	< 0.001*

*$p < 0.001$.

(mean = 2.8, SD = 1.3) and negative (mean = 2.5, SD = 1.4) events were more frequently endorsed, followed by a lower preference for personal-external attributions for positive events (mean = 1.8, SD = 1.2) and negative events (mean = 2.1, SD = 1.3) and an even lower tendency to attribute events to external-situational factors for positive (mean = 1.4, SD = 1.0) and negative events (mean = 1.5, SD = 1.4).

Next, the hypothesis that poor occupational activity would be associated with an external attributional style for negative events and this relationship would not be accounted for by depression or paranoia was tested by comparing attributional scores of the active and non-active groups, using ANCOVA analyses (see Table 4), where the dependent variables were external attributions for positive and negative events as assessed by the ARAT, and activity status at time of the current assessment was the independent variable. Current depression and suspiciousness were entered as covariates as they have previously been associated with attributional biases in psychosis. Table 4 shows that the inactive group made significantly more external attributions for failures than active participants and that this difference was not accounted for by depression or paranoia. Neither of the two covariates emerged as significant predictors of external attributions.

Hierarchical logistic regression to predict membership to active or inactive groups at 18 months

A hierarchical logistic regression analysis was performed to assess prediction of membership of occupational status (active/inactive) at 18 months on the basis of concurrent externalizing attributional style, negative symptoms of psychosis and executive functioning, after controlling for previous occupational functioning (baseline occupational status and hours spent in activity during the 18 months[3]) and treatment variables during the 18-month period (psychology input). Only variables that have been shown to be significantly different between active and inactive groups at 18-month groups were entered as potential predictor variables. The hierarchy consisted of two steps and was structured as follows: Block 1 (baseline occupational status; hours in activity during the previous 18 months; psychology input) and Block 2 (externalizing attributional style at 18 months, negative symptoms of psychosis and executive functioning at 18 months). All three blocks were performed using the simultaneous method. A total of 46[4] cases were analysed and the full model was significantly reliable (Chi-square = 36.1, df = 6, $p < 0.001$).

This model accounted for between 54.4 and 72.8% of the variance in active status, with 90.5% of the 'active' participants and 92.0% of the 'inactive' participants successfully predicted. Overall, 91.3% of predictions were accurate. Table 5 gives coefficients and probability values for each of the predictor variables. This shows that concurrent attributional style and hours spent in activity (work or education) in the previous 18 months significantly predict activity group. A decrease of 1 h spent in occupational activity during the previous 18 months is associated with an increase in the odds of being inactive at 18 months by a factor of 0.996. An increase of one unit of external attributions for negative events (blame external causes for failures) is associated with an increase in the odds of being inactive in the vocational domain by a factor of 2.6. In other words, avoiding responsibility for failures and reduced engagement in occupational activity in the previous 18 months is associated with a decreased likelihood of being involved in vocational activities at 18-month follow-up.

Discussion

Main findings

The current study investigated the potential role of social cognition in explaining occupational functioning in a sample of people with early psychosis. The data confirmed the main hypothesis of the study, namely, that occupational inactivity would be associated with external attributions for negative events. Although poor executive functioning and positive symptoms of psychosis were linked to being occupationally inactive, attributional style emerged as a stronger predictor of level of functioning in this sample of people with early psychosis. Reduced engagement in occupational activities during the previous period was also significantly predictive of poor occupational functioning at 18 months.

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[3] From the variables reported in section (Table 3), 'Hours of occupational activity during the previous 18 months' (and not 'number of weeks in occupational activity during the previous 18 months' or 'percentage of weeks engaged in occupational activity during the previous 18 months') were entered in Block 1. As these three variables were highly inter-correlated, their inclusion would have caused multicollineariliy problems. 'Hours of activity' was selected because it provided the most detailed amount of information.

[4] SPSS included 46 of the 50 participants into the logistic regression analysis as there were some missing data in 4 participants: Two participants had refused to complete the measure on executive functioning (WCST), one participant did not complete the attribution task (ARAT) and one participant did not complete the 18-month symptoms measure (PANSS positive symptoms).

Table 4. *Group comparisons between activity groups on executive functioning, symptoms and attributional style at 18 months*

		Active (n = 22)	Inactive (n = 28)	Test[a]	p
Symptoms	PANSS positive 18 m	10.3 (3.0)	13.3 (6.1)	$t(47) = -2.1$	0.042*
	PANSS negative 18 m	11.1 (4.5)	13.0 (3.8)	$t(47) = -1.6$	0.108
	PANSS general 18 m	25.6 (6.2)	29.2 (7.8)	$t(47) = -1.7$	0.086
	Calgary Depression Inventory 18 m	2.4 (3.0)	2.4 (3.2)	$t(47) = -0.1$	0.962
Executive function	Perseverative errors (WCST)	11.3 (6.1)	17.3 (10.4)	$t(46) = -2.3$	0.025*
Attributions	External attributions for positive events	3.4 (1.2)	3.0 (1.4)	$F(1, 43) = 0.5$[b]	0.480
	External attributions for negative events	2.8 (1.3)	4.1 (1.3)	$F(1, 43) = 11.29$[b]	0.002**

[a]WCST (n = 48); PANSS (n = 49) and ARAT (n = 49) as four participants refused to complete one of these measures.
[b]Covariates: current depression (Calgary depression inventory at 18 months) and suspiciousness (P6 items in the PANSS at 18 months).
*p < 0.05.
**p < 0.01.

Inactive participants had higher positive symptoms and impairments on executive functioning than active participants. These findings on executive functioning replicate previous data from samples with more chronic illnesses (Green *et al.* 2000). Cognitive inflexibility and reduced inhibitory function have been suggested to underlie perseverative errors in the WCST (Heaton, 1981). However, when these were included in a hierarchical logistic regression along with attributional style, only the latter remained a significant predictor of activity.

Taking responsibility for failures: a key attribution among active participants

The approach taken to exploring occupational activity in psychosis was an original feature of the study. Attributional style has been linked to achievement

Table 5. *Summary of hierarchical logistic regression for variables predicting occupational inactivity at 18 months (n = 46)[a]*

Predictor	B (SE)	Odds Ratio (95% CI)	Wald	p
Block 1: Prior occupational functioning and treatment				
Occupational activity (active/inactive) at baseline	0.07 (1.3)	1.07 (0.08–14.01)	0.0	0.956
Hours in activity during previous 18 months	−0.004 (0.002)	0.996 (0.993–0.999)	6.3	0.012*
Psychological therapy during previous 18 months Y/N	1.6 (1.4)	4.95 (0.53–46.15)	1.9	0.160
Block 2: Concurrent symptoms and social cognition				
External attributions for negative events	0.9 (0.4)	2.57 (1.11–5.93)	4.9	0.027*
Executive dysfunction	2.3 (1.4)	10.26 (0.61–170.62)	2.6	0.105
Positive symptoms of psychosis	0.08 (0.1)	1.09 (0.81–1.46)	0.3	0.572

[a]Dependent variable encoding: active at 18 months = 0 (n = 21), inactive at 18 months = 1 (n = 25). Active: any type of vocational activity (work or education); Inactive: unemployed and not engaged in education. Odds ratio = Exp (Beta); external attributions for negative events assessed by the ARAT; executive dysfunction assessed by the number of perseverative errors in the WCST; positive symptoms of psychosis as assessed by the positive scale of the PANSS at 18 months.
*p < 0.05.

motivation in the social psychology literature (Weiner, 1986) and is a cognitive construct that could potentially contribute to explaining vocational behaviour in people with psychosis. Although there has been no previous research on attributions in vocational activity in early psychosis, there is evidence that cognitive constructs might be important in explaining the impact of impairments on functional outcome. Self-efficacy about symptom management shapes psycho-social functioning (Mueser *et al.* 1997; Ventura *et al.* 2004) and a fatalistic LoC (i.e., believing that chance determines the course of events) predicted poorer vocational functioning in outpatients attending a rehabilitation programme (Hoffmann *et al.* 2003). In the current study, attributional style was found to be a stronger predictor of involvement in occupational activities than executive dysfunction or psychotic symptoms.

We therefore propose that how people with psychosis interpret events, and especially failures, is important in explaining vocational functioning in early psychosis. Specifically, if people with psychosis attribute negative events to external causes rather than to themselves, they might be less likely to engage in achievement-related behaviour.

There are some environmental factors that could account for excessive externalization of failures in adults with psychosis. Parsons (1951) described the 'sick role' as a status associated with both rights and obligations: the individual is expected to accept the need to be cared for, and in turn she/he is 'exempt from everyday social roles' and 'from the responsibility of getting well by their own actions alone'. As a predominant medical approach, characterized by low levels of patient involvement, prevails among mental health services (Goss *et al.* 2008), there is still a need to promote the involvement of clients in therapeutic decision-making (Del Piccolo & Goss, 2012) and to ensure that mental health services adopt psycho-social interventions to facilitate social integration and recovery (Saraceno, 2012). Evidence suggests that the move from a paternalistic stance, in which the mental health-care system is 'in control' of the lives of people diagnosed with severe mental disorder, to patient-centred care, in which patients have a sense of responsibility for their own particular health status is promoted, increases the likelihood that patients will look after their health (Tansella & Thornicroft, 2009; Ruggeri & Tansella, 2012).

In the job market, contextual factors that promote the 'sick role' include welfare benefit-related financial disincentives, which act as barriers for seeking paid work among people with mental health problems in the UK (O'Flynn & Craig, 2001; Marwaha & Johnson, 2004; Leff & Warner, 2006; SE_SURG, 2006; Lloyd-Evans *et al.* 2012). Discrimination, the behavioural aspect of stigma, is also still commonly experienced by people with a diagnosis of schizophrenia all over the world, with little transnational differences (Rose *et al.* 2011; Lakeman *et al.* 2012). Negative discrimination experiences range from 'humiliation', 'abuse', 'being mocked', 'being discounted', to 'well-meaning over-protection' by work colleagues, involving shielding the person with mental health difficulties from the more difficult aspects of work. In spite of some improvements in employers' knowledge of mental health and their willingness to offer 'reasonable adjustments' for people with mental health difficulties over the recent years (Little *et al.* 2011), as well as governmental initiatives, such as the 'Working our way to better mental health' framework (Department of work and pensions, 2009) and specific legislation such as the Equality Act 2010, there is still the need to formalize these arrangements and the need for further training and support.

At the core of the recovery process is the notion of *empowerment*, conceptualized as 'personal responsibility', 'control over life' and 'focusing upon strengths' (Slade *et al.* 2012) and promoted and advocated by the service-user community (Davidson, 2012). A sense of agency, identifying personal capabilities such as responsibility and accountability, are crucial for social integration and work (Ware *et al.* 2007, Warner, 2010; Baumgartner & Susser, 2012), as is the existence of available opportunities to exercising such sense of personal agency (Burns, 2011, 2012).

Limitations

The current study was conducted opportunistically at the 18-month follow-up of the LEO trial (Craig *et al.* 2004; Garety *et al.* 2006). Hypotheses about attributional style were tested using cross-sectional data which do not enable an assessment of the direction of effects. For instance, people who are unemployed are likely to feel disempowered and this could activate an externalizing attributional bias. The literature on attributional style in both depression and achievement motivation suggests that the influence is likely to be bi-directional. Thus, even if the current externalizing attributional bias was triggered by contextual factors (such as unemployment or hospitalization), the presence of such a bias is likely to further influence the person's behaviour because of the way she/he appraises events.

The ARAT assesses attributions using only the dimension of *loci to self, others or situation*. What can be concluded from the study is that active participants were more likely to provide internal attributions for failure events than inactive participants. However,

the critical distinction between 'taking responsibility' *v.* 'global self-damning' internal attributions is not captured by the ARAT. An alternative multidimensional approach to attributions would have distinguished between attributions for negative events that foster and promote achievement-related behaviour (i.e., internal, unstable and controllable) from attributions that have a negative impact on self-esteem (i.e., internal, stable and uncontrollable) (Weiner, 1995). However, examination of the type of internal causes embedded in the negative scenarios in the ARAT suggests that they fall in the former category (i.e., internal, unstable and controllable)[5], and are indicative of 'taking responsibility' rather than 'global self-damning'.

Future research should also examine the relative tendency to attribute blame to other people in detriment of circumstantial factors when externalizing (Bentall *et al.* 2001; Combs *et al.* 2009; Fornells-Ambrojo & Garety, 2009*a*), a distinction that was not investigated in the current study but is likely to influence interpersonal behaviour involved in gaining and sustaining employment. Deficits in ToM, have been found to be associated with a tendency to personalize blame in detriment to circumstantial explanations when making causal attributions (Kinderman *et al.* 1998; Taylor & Kinderman, 2002; Randall *et al.* 2003), as the more complex circumstantial attributions rely on the ability to take another person's perspective to understand the circumstances that caused them to act in a certain way. Further research should investigate if such personalizing bias is more common in people who are occupationally inactive and if the bias is explained by ToM deficits, which have been systematically found to be impaired in people with schizophrenia (Brüne, 2005; Sprong *et al.* 2007).

Implications

The current study suggests that the promotion of self-confidence, support to take calculated risks and the acceptance of *responsibility* for these which are involved in the service user's empowerment (Fisher, 1994; Slade *et al.* 2012) are legitimate targets that can be added to well-established vocational intervention models that have been found to be effective in people with early – episode psychosis, such as the Individual Placement and Support (IPS) model (Rinaldi *et al.* 2010).

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[5] Internal causes embedded in the negative scenarios in the ARAT: N1: 'you had difficulties with the management in the past and have a poor performance record'; N2: 'you don't ask any questions'; N3: 'you forget to make dinner reservations'; N4: 'you don't talk much because you are tired'; N5: 'your presentation is disorganized'; N6: 'you haven't done all the work that the boss expects from you'.

Attributional style has long been an intervention target in CBT for depression (Seligman *et al.* 1998) and more recently in CBT for paranoia and hallucinations (Kinderman & Benn, 2001). An externalizing attributional bias could potentially be targeted in rehabilitation programmes. Interestingly, a recent randomized controlled trial of CBT for improving social recovery in people with non-affective early psychosis reported significant improvements in weekly hours of structured and constructive economic activity, as well as reduction in global psychopathology and hopelessness (Fowler *et al.* 2009; Hodgekins & Fowler, 2010). The CBT intervention targeted negative beliefs about the self, stigma and aimed to promote a sense of agency.

Conflict of Interest

None.

Ethical standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

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