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Jumping to conclusions and the persistence of delusional beliefs in first episode psychosis

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ABSTRACT

Background: Cognitive biases may contribute to delusion persistence. We tested this in a longitudinal study of first episode psychosis (FEP).
Methods: 34 FEP patients completed assessments of delusions and Jumping to Conclusions (JTC) at baseline and 12-month follow-up.
Results: JTC was associated with baseline delusion severity ($t(32) = 2.7$, $p = 0.01$). Baseline delusions persisted at follow-up for 8/20 participants (40%), who all jumped to conclusions (8/8, 100%), compared to half of those with no or changeable delusions (14/26, 54%; χ^2 (df = 1) = 5.7, p = 0.03; Phi = 0.4).
Conclusion: Findings implicate cognitive biases in delusion persistence, and support the potential to reduce delusions through reasoning-focused interventions.

1. Introduction

The Jumping to Conclusions (JTC) bias is a tendency to make decisions with certainty based on limited data-gathering. There is substantial support for its presence in patients with delusions (Fine et al., 2007; Garety et al., 2011; So et al., 2012; Garety and Freeman, 2013; Jolley et al., 2014), and emerging evidence of associations with outcome and change in delusions, both as a potential marker for response to antipsychotic medication (Andreou et al., 2014; Menon et al., 2008; So et al., 2014) and a manipulable target of psychological intervention (e.g. Garety et al., 2014; Lincoln et al., 2014; Moritz et al., 2013; Sanford et al., 2013; Warman et al., 2013).

To date, only one study has investigated JTC and delusion persistence in first episode psychosis (FEP; Dudley et al., 2013). Dudley and colleagues found persistent JTC and delusions to be associated at follow-up, but no baseline associations, providing only partial support for a maintaining role of JTC. Possible reasons for the failure to find baseline associations include subjective rating of delusions according to the dimension of distress and low baseline rates of JTC and delusion severity. Our own previous work showed that, when using objective assessments of delusions, in a FEP group with rates of delusions and JTC comparable to those found in established psychosis, the baseline association of the JTC bias with delusion severity was replicated (Falcone et al., 2014).

The current study is a longitudinal follow-up of the same participants at 12-months. Our aim was to investigate the association of the JTC bias with delusion persistence, as persistent delusions are the targets of psychological intervention. We hypothesised firstly that we would replicate the association of JTC with delusion severity at baseline (i.e. during a psychotic episode) found in our larger sample, and secondly that the persistence of delusions at a clinical level of severity would be associated with the tendency to JTC.

2. Methods

2.1. Participants

Thirty-four participants (31% of the baseline sample (n = 108) reported by Falcone et al., 2014) completed measures of delusions and reasoning at both baseline and 12-month follow-up. All participants completing study measures at the two time points were included. Participants were assessed as part of the Genetics and Psychosis (GAP) study (Di Forti et al., 2012; O'Connor et al., 2012; Stilo et al., 2013; Wiffen et al., 2014) which was designed to identify genetic and environmental factors associated with psychosis. Ethical approval was granted by the joint Institute of Psychiatry and South London and Maudsley

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NHS Foundation Trust Research Ethics Committee; all participants gave informed written consent. GAP clinical inclusion criteria were: a current diagnosis of first episode psychosis (determined by clinical interview according to OPCRIT and DSM-IV criteria (APA, 1994; McGuffin et al., 1991)); within six months of first contact with services; current psychotic symptoms, experienced for at least seven days; age 18–65 years. Exclusion criteria were: a history of moderate or severe learning disabilities, or current IQ < 70, as assessed by the Wechsler Adult Intelligence Scale—Third Edition (Wechsler, 1997); insufficient command of English to complete assessments; a history of previous contact with mental health services for psychosis; a primary diagnosis of alcohol or substance dependency or a known organic cause of psychosis.

2.2. Measures

Demographic data were collected by self-report, supplemented by clinical records. The delusion item of the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987) provided ratings of mean delusion severity (from 1 (absent) to 7 (extremely severe)). Delusion presence (rating ≥3 (mild)) was dichotomised into persistent (present at baseline and 12-month follow-up) or not (absent/present only once).

Jumping to Conclusions (JTC): Two versions of the Probabilistic Reasoning 'Beads' Task (Garety et al., 2005) were employed, with beads in 85:15 and 60:40 ratios. Participants were shown two jars containing coloured beads in opposite ratios (e.g., mainly black: 85 black and 15 orange beads; mainly orange: 85 orange and 15 black beads), then a series of beads, one at a time, drawn from one of the two jars randomly selected by the computer. Participants were asked to request as many beads as they needed to be certain of the jar of origin. Deciding after fewer than three beads was classified as JTC. As we were concerned with the potential for the bias to influence day-to-day decision-making, rather than its consistency between tasks, or over time, we considered a single hasty decision on any task, at any time point to be evidence of the tendency to JTC, and rated this dichotomously (no JTC/JTC at least once; Garety et al., 2005; Jolley et al., 2014; So et al., 2012).

2.3. Analyses

Data were analysed using the Statistical Package for the Social Sciences Version 20.0 (IBM, 2011). Rates of JTC and delusions and delusion severity were compared at baseline and follow-up using McNemar tests and paired sample t-tests. For hypothesis one, severity of delusions between JTC groups at baseline was compared using independent sample t-tests. For hypothesis two, rates of JTC between those with and without persistent delusions were compared using Chi-square tests.

3. Results

Demographic and clinical characteristics are shown in Table 1. Participants were predominantly male (22/34, 65%) and of Black or Minority Ethnic (BME) background (23/34, 68%).

3.1. Hypothesis 1: JTC will be associated with the severity of delusions at baseline

The findings replicated our previous report (Falcone et al., 2014), with more severe delusions in those showing the JTC bias (JTC mean: 3.4 (SD 1.4); no JTC mean: 2.2 (SD 1.2), t = 2.7, df = 32, p = 0.01). Of the 20 participants with delusions at baseline, 55% (11/20) jumped to conclusions, compared to 29% of those without delusions (4/14).

Table 1
Demographic and clinical characteristics at baseline and follow-up.

	Baseline (n = 34)	Follow-up (n = 34)	p
	Mean (SD)		
Age in years	27.9 (7.9)	29.1 (7.7)	
[Range]	[18–50]	[19–51]	
PANSS delusion severity	2.7 (1.4)	2.2 (1.6)	t = 1.8 (df = 33), p = 0.08
[Range]	[1–6]	[1–6]	
	n (%)		
JTC			
85:15	14 (41)	13 (38)	
60:40	9 (26)	10 (29)	
Either	15 (44)	14 (41)	p = 1.0[a]
Delusion presence	20 (59%)	13 (38%)	p = 0.03[a]
Diagnosis			
Schizophrenia	8 (23)		
Schizophreniform disorder	5 (15)		
Psychotic disorder NOS	6 (18)		
Schizoaffective disorder	4 (12)		
Affective disorder with psychosis	11 (32)		

Key: PANSS, Positive and Negative Syndrome Scale; JTC, Jumping to Conclusions.
[a] McNemar test; NOS: not otherwise specified.

3.2. Hypothesis 2: JTC will be associated with the persistence of delusions at follow-up

Overall rates of JTC remained consistent, with two thirds showing the bias at least once (22/34; 65%), though only seven individuals showed the bias consistently (Table 2). Rates of delusions reduced, with a non-significant reduction in delusion severity (Table 1). Nearly half of those with delusions at baseline had persisting delusions at follow-up (8/20; 40%), and all those with persisting delusions jumped to conclusions at least once (8/8, 100%), compared to half of those with no (6/11) or changeable (8/15) delusions (14/26, 54%; χ^2 (df = 1) = 5.7, p = 0.03; Phi = 0.4; Table 2).

4. Discussion

We tested associations of the JTC reasoning bias with delusion persistence in FEP. The prevalence and severity of delusions and rates of JTC in followed-up participants matched our previous, larger study (Falcone et al., 2014), suggesting that this subsample comprised representative participants. At baseline, during participants' first psychotic episode, the well-established association of delusion severity with JTC was replicated. Over time, rates of JTC remained stable, but individual participants showed variation in their data-gathering, with only a third never jumping to conclusions. Delusions mostly improved over time, but persisted for around half of participants. All participants with persisting delusions jumped to conclusions at least once, compared to only half of those with no or changeable delusions. The association of JTC with delusion persistence was significant, with a medium to large effect size. Limitations of the study include the small number of participants followed up from baseline (31%); that we did not control for the effects of medication or any other treatments; and that data on age of onset were not collected for this study. The mean delusion scores presented in Table 2 are based on small numbers, and are reported to explicate the results, rather than to represent a reliable statistical average. We operationalised JTC as a dichotomous variable, using the criterion of fewer than three beads to indicate the presence of the bias. Analyses of the number of draws to decision, or employing an alternative dichotomy, were not carried out, and may have given different results. Finally, notwithstanding the longitudinal design of the study, we did not test whether the bias precedes the development of delusions, and a causal role for the bias in the onset of delusions cannot be inferred from these results.