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Letter to the Editor

Change in jumping to conclusions linked to change in delusions in early psychosis

Dear Editors,

Symptom-related cognitive biases such as jumping to conclusions (JTC) can potentially be the focus of cognitive therapies such as cognitive behavioural therapy for psychosis (CBTp; Lecomte et al., 2003) and metacognitive training (MCT; Moritz et al., 2011). To provide support for such an approach it is important to demonstrate correspondence between change in delusions and change in JTC. JTC studies typically employ the beads task, where an individual is presented with two jars containing different ratios of beads of two colours, and is asked to decide from which jar a series of beads are being drawn. A cross-sectional association between delusions and JTC is a well replicated finding in cognitive neuropsychiatry research. In past work, we demonstrated a correspondence between change in delusions and change in JTC (Woodward et al., 2009). In the current study we attempted to replicate our previous finding (Woodward et al., 2009), but this study design is complicated by (1) miscomprehension of the task when drawn bead colours vary (Speechley et al., 2010; Balzan et al., 2012), and (2) quicker decisions when the study design involves closely-spaced testing sessions (Peters and Garety, 2006; Woodward et al., 2009). Therefore, we investigated correspondence between change in delusions and change in JTC using a series with a uniform colour to facilitate comprehension (Speechley et al., 2010; Balzan et al., 2012), combined with a longer time interval (6 months in addition to the typical 12 weeks) to minimize learning effects.

Thirteen first-episode psychosis patients receiving group CBTp and antipsychotic medication were recruited from Early Psychosis Intervention programmes and community health clinics in Quebec, Canada. Participants were tested at three time points: (1) baseline, (2) immediately following the 12-week CBTp, and (3) 6-month follow-up after completion of CBTp. Symptoms were measured using the Brief Psychiatric Rating Scale (Ventura et al., 1993), which consists of 24 symptom constructs rated on a 7-point scale. Delusion scores were calculated as the mean of the grandiosity, suspiciousness, and unusual thought content items.

A JTC task involving two lakes, containing black and white fish in different ratios, was used. Each lake contained 50 fish, with 60%:40% white:black fish in one lake and the complementary ratio in the other. A series of 10 white fish were displayed as being caught from one of the lakes. After each catch, the participant indicated whether s/he had decided which lake the fisherman was fishing from, or if they would like to see more fish. Participants did not make probability ratings for the lakes.

A group-level analysis of variance (ANOVA) testing change over time suggested that mean change over the three time points was not

significant ($T_1, T_2, T_3 = 2.31, 2.08, 2.03; 3.31, 2.69, 3.15; p > .6$ and $p > .2$ for change in delusions and number of draws, respectively). Looking at individual differences, no significant correlation between change in delusions and change in number of draws requested was observed for the shorter time interval (12-weeks), $r(11) = 0.22$, $p = .47$, but a significant negative correlation was present from baseline to 6-month follow-up, $r(11) = -0.58$, $p < .05$. The negative correlation between change in delusions and change in number of draws requested for the larger time interval replicates our previous finding of correspondence between change in delusions and change in JTC (Woodward et al., 2009). The absence of a correlation at the shorter time interval for this version of the task may be attributable to a repeated-testing effect, as the number of draws requested tends to decrease when task procedures are fresh in memory (Peters and Garety, 2006; Woodward et al., 2009). This repeated-testing effect may counteract an increase in draws requested, which is expected to occur when delusions decrease. For example, although Peters and Garety (2006) found no change in the number of draws requested in a follow-up test when delusions had remitted, a reduction in the number of draws requested was observed on healthy control subjects at follow-up on the same task.

Such demonstrations of JTC fluctuating with delusions provide further evidence that it may be a cognitive underpinning of delusions, and that it can potentially be the focus of cognitive therapies. A statistical test of a model proposing that JTC mediates the relationship between CBTp and delusions would advance this area of research, but requires variation in the level of treatment as with medication studies. In the current study design, all subjects received exactly the same CBT treatment, but future studies may address this important question. These findings have implications for both psychological and pharmaceutical interventions, as an understanding of the cognitive underpinnings of psychotic symptoms may enhance the optimization of treatment responsiveness in pharmaceutical and non-pharmaceutical interventions.

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