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Development of the Davos Assessment of Cognitive Biases Scale (DACOBS)

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ABSTRACT

Objective: Cognitive problems and biases play an important role in the development and continuation of psychosis. A self-report measure of these deficits and processes was developed (Davos Assessment of Cognitive Biases Scale: DACOBS) and is evaluated in this study.
Methods: An item pool made by international experts was used to develop a self-report scale on a sample of 138 schizophrenia spectrum patients. Another sample of 71 patients was recruited to validate the subscales. A group of 186 normal control subjects was recruited to establish norms and examine discriminative validity.
Results: Factor analyses resulted in seven factors, each with six items (jumping to conclusions, belief inflexibility bias, attention for threat bias, external attribution bias, social cognition problems, subjective cognitive problems and safety behavior). All factors independently explained the variance (eigenvalues > 2) and total explained variance was 45%. Reliability was good (Cronbach's alpha = .90; split-half reliability = .92; test–retest reliability = .86). The DACOBS discriminates between schizophrenia spectrum patients and normal control subjects. Validity was affirmed for five of seven subscales. The scale 'Subjective Cognitive problems' was not associated with objective cognitive functioning and 'Social cognition problems' was not associated with the Hinting task, but with the scale measuring ideas of social reference.
Conclusions: The DACOBS scale, with seven independent subscales, is reliable and valid for use in clinical practice and research.

1. Introduction

Neurocognitive deficits or limitations and cognitive biases contribute to the development and continuation of hallucinations and delusions (van der Gaag, 2006; Garety et al., 2007). Neurocognitive limitations are permanent reductions in the capacity to attend, remember or reason. In cognitive biases the processing capacity is not affected, but the cognitive process shows a strong deviation in judgment, which may sometimes lead to perceptual distortion, illogical interpretation, or what is broadly defined irrationality. Cognitive biases are quite prevalent in the general population. And although the biases are associated with psychopathology, the majority of people with cognitive biases are not a psychiatric patient. Biases arise from various processes that are sometimes difficult to distinguish. Some biases affect attention; others affect decision-making or judgment of likelihood or causality, while some affect memory recall or motivation. What cognitive biases are associated to psychopathology?

Selective attention is a perceptual bias and is transdiagnostic in nature. As there is selective attention for food in eating disorder and dogs in dog phobia, in paranoid psychosis there is usually selective attention for threat (Phillips et al., 2000; Moritz and Laudan, 2007; Lim et al., 2011). Another type of cognitive bias is a reasoning bias known as the data gathering bias that is specifically associated with delusions, irrespective of diagnosis (Peters et al., 2008). Data gathering bias is also known as 'jumping to conclusions' (JTC) and is an endophenotypical bias. This means that the bias is present before, during and after disease episodes, with parents and siblings demonstrating this bias in a slightly raised level compared to the general population (Van Dael et al., 2006). The bias to perceive other people as hostile and the self as a target of hostility is present in people with persecutory delusions (Combs et al., 2009). Delusional patients are also characterized by a bias against disconfirming evidence (Woodward et al., 2006, 2007). This bias, also known as belief inflexibility bias, prevents the reappraisal of situations and locks the patient in delusional

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convictions (Woodward et al., 2008). Covariance bias is the bias to underestimate coincidence and to overestimate causal and personally meaningful events and is certainly present in the prodromal and psychotic stage; however, no research has been undertaken to demonstrate covariance bias in psychosis. Source monitoring bias is the bias to attribute own thoughts and utterances to an external origin after a short while and is associated with hallucinations. This latter bias can be used in education about auditory hallucinations. Intervention effects have only been demonstrated for medication (Keefe et al., 2003).

Cognitive problems in understanding the motives, feelings and thoughts of other people and deficits in attention, memory and executive functions contribute to the misunderstandings and conflicts that characterize the development and persistence of delusions and psychosis in general. Theory of mind mediates between social cognition and social performance (Couture et al., 2011). Social cognition is an independent domain from neurocognition (van Hooren et al., 2008). Avoidance behavior is known for its strong impact on the continuation of all kinds of psychic disorders and is associated with the severity of the disorder (Freeman et al., 2007a).

All these biases play a role in psychosis, but are they open to change? Training and therapy results have been documented for JTC with metacognitive training (MCT) (Moritz and Woodward, 2007; Moritz et al., 2010; Landa et al., 2011; Moritz et al., 2011; Ross et al., 2011), selective attention for threat (Van Damme et al., 2006), and perceiving oneself as a target of hostile others (Penn et al., 2007; Landa et al., 2011). The Social Cognition and Interaction Training (SCIT) by Penn and colleagues succeeded to improve emotion perception and theory of mind, and to reduce the attribution of hostile intent to others in a pilot study (Penn et al., 2007) and to improve emotion perception and theory of mind in a small randomized trial in bipolar patients (Lahera et al., in press) and improved emotion perception and social skill in a small quasi-experimental study (Roberts and Penn, 2009). The tentative conclusion is that targeting the improvement of biases may improve outcome in psychosis.

Now that we know more of the underlying cognitive processes in psychosis, therapy that addresses these biases and processes might be more effective than generic CBT that is restricted to current worries. Therapists need a reliable and valid instrument to assess the presence and severity of cognitive biases and cognitive processes.

The Beck Cognitive Insight Scale is a reliable and valid self-report measure of two biases: self-certainty and self-reflectiveness (Beck et al., 2004). Insight is the composite score of reflectiveness minus self-certainty. Cognitive insight has predicted gains in psychotherapy for psychosis, and improvement in insight has been associated with improvement in delusional belief (Riggs et al., 2012). Another self-report measure is the Cognitive Biases Questionnaire. Thirty vignettes (15 relating to 'anomalous experiences' and 15 relating to 'threatening events') can be responded to with five cognitive styles: jumping to conclusions, intentionalizing, catastrophizing, emotion-based reasoning and dichotomous thinking. The instrument has been described and published as an abstract (Peters et al., 2010).

This paper reports the development of a short self-report instrument with statements that are scored on a 7-point Likert scale. The questionnaire overlaps and extends the number of cognitive biases and cognitive limitations and adds safety behavior as the important factor in delusion maintenance. The questionnaire specifically aims to measure four cognitive biases (jumping to conclusions, belief inflexibility, selective attention for threat, external attribution bias), two cognitive limitations (social cognition problems; subjective cognitive problems) and avoidance behavior. Such an instrument may be useful in CBT. Knowing which biases and problems are active can be helpful during case formulation and designing specific therapeutic interventions.

The aims of this study were to examine the: (1) development of an instrument with a sound factor structure, (2) reliability of the instrument by measuring the internal consistency, the split-half reliability and the test–retest reliability, (3) discriminative validity to distinguish patients from non-clinical subjects, and (4) convergent validity of the instrument by comparing subscales with other instruments measuring the same constructs.

2. Method

2.1. Construction of an item pool

Experts from the United States (JL), Switzerland (WT), Belgium (PD) and the Netherlands (MB, MvdG) constructed a pool of 70 items to measure the above-mentioned seven a-priori subscales. Each item is a statement that was scored on a 7-point Likert scale with a two-week time frame.

2.2. Participants

Three samples were recruited. The initial work on scale development, factor analysis and reliability consisted of 142 schizophrenia spectrum patients (clinical sample 1) and 186 non-clinical controls (non-clinical controls).

The subjects of clinical sample 1 were recruited at secondary mental health services in the Netherlands: Mondriaan Care Group, South-Limburg; Parnassia Psychiatric Institute, Den Haag; Arkin, Amsterdam; Psychiatric Institute Drenthe; Psychiatric Institute Noord-Holland-Noord; University Medical Center Groningen; Psychiatric Institute Leiden; Altrecht, Utrecht; BAVO-Europoort, Rotterdam. Four patients completed less than 2/3 of the items and were excluded from analysis, so the final sample consisted of 138 patients.

The validation of the instrument was done on another sample of 71 patients with schizophrenia spectrum disorder (clinical sample 2). The clinical sample 2 was recruited in the Rivierduinen Psychiatric Institute, The Netherlands. Power analysis was set to effect-size = .4, alpha = .05 and power = .95. The total sample size needed was 71 participants. In total, 72 patients consented to participate in the study. One patient had insufficient competence of the Dutch language and was excluded.

A total of 186 non-clinical control subjects were recruited by means of several calls for participation at university, shopping centers, sport clubs, etc.

After comparison of the DACOBS scores of the patients in both clinical samples, no significant differences emerged. Demographic characteristics are shown in Table 1. Again, the groups are comparable, except for their living arrangements. Clinical sample 2 more often lived independently, whereas clinical sample 1 more often lived with their parents or in sheltered housing.

2.3. Procedure

All participants had to be aged between 18 and 65 years and competent in the Dutch language. Participants were asked to answer all statements and to disclose some demographic characteristics. Patients of clinical sample 1 were asked to give their address if they were willing to fill in the same questionnaire again after two weeks. They were paid 5 Euro if they returned the completed questionnaire in two weeks' time.

Clinical sample 2 completed the DACOBS and a validation test battery, which consisted of seven tests and questionnaires. An experienced psychologist (C.S.) conducted the validation test battery, which took 1.5 to 2 h to accomplish. These patients were paid 10 Euro for their participation.

The non-clinical control subjects only filled in the DACOBS to develop norm scores.