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Metacognition and Cognitive Biases in the Treatment of Psychosis

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2018

document version

Publisher's PDF, also known as Version of record

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citation for published version (APA)

van Oosterhout, B. J. (2018). *Metacognition and Cognitive Biases in the Treatment of Psychosis*. [PhD-Thesis - Research and graduation internal, Vrije Universiteit Amsterdam].

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Summary

This thesis focuses on the extent to which a specific focus on cognitive biases and metacognitive beliefs (metacognition) has added value with respect to the current treatment options for patients with psychotic symptoms. **Chapter 1** presents an introduction to this research area. Regarding treatment of psychotic symptoms, over the years cognitive behavioural therapy (CBT) in psychotic symptoms (CBTp) has proven to be effective. However, given the modest results of CBTp (small-to-medium effect sizes) and the similar results for pharmacological interventions there is room for improvement by ameliorating existing therapies or developing new treatment methods. Problems in neurocognition, social cognition, metacognition and cognitive biases contribute to and/or are associated with psychotic symptomatology. Therefore, they might offer valuable insight/information to help decrease these symptoms. Models on psychosis incorporating recent knowledge about metacognition and cognitive biases are discussed. Emerging therapies that were developed subsequently such as Metacognitive Training (MCT) and Competitive Memory Training (COMET) are explained. The first two studies, which relate to auditory verbal hallucinations (AVHs) are introduced. We hypothesized that metacognition and metacognitive beliefs contribute significantly to levels of depression and anxiety in voice hearers. Furthermore we did a randomised controlled trial on the efficacy of the COMET. Finally, the later chapters that relate to delusions, the efficacy of metacognitive training and the ability of the individual modules to influence specific cognitive biases, are introduced.

Auditory verbal hallucinations

Using a cross-sectional design, the study described in **chapter 2** examined i) the relationship between metacognitive beliefs (regular/cognitive) and ii) beliefs about voices and their hypothesised relationship with levels of depression and anxiety in psychotic patients with auditory verbal hallucinations ($n = 77$). These data were derived from our randomised controlled trial (RCT) on the effects of COMET. Significant associations were found between negative beliefs about voices and negative metacognitive beliefs. The metacognitive factor ‘uncontrollability and danger of thinking’ proved to be a key variable in explaining differences in levels of depression and anxiety and had a greater explanatory value than all other beliefs when analysed together. These results offer modest support for models that emphasise the idea that metacognitive beliefs are a core feature in the development and maintenance of depression and anxiety in patients with severe auditory verbal hallucinations.

In **chapter 3**, in an RCT including 77 participants, Competitive Memory Training (COMET) was compared with treatment as usual (TAU). The group receiving COMET improved on depression ($d = 0.64$) compared to TAU, whereas no significant effects were found on auditory verbal hallucinations. The effect of COMET on depression was fully mediated by self-esteem and acceptance of voices, and partially mediated by social rank and power attributed to the

voices. It is interesting that, although COMET does not discuss the meaning and convictions of hallucinations, it did result in reappraisal of the meaning of hallucinations. These findings are consistent with the results of similar COMET protocols applied in other psychiatric diagnoses. Distancing from cognitive processes, such as hearing voices (metacognitive strategy: hearing voices is a psychic event from which one can distance) and impacting on accessibility of memory networks (restructuring of memory networks), are promising therapeutic techniques that can also be applied within generic cognitive behavioural therapy.

Delusions

In **chapter 4**, a comparison was made between MCT+TAU and TAU alone in an RCT with 154 participants. Both conditions showed a decrease of delusions. MCT was not more efficacious in terms of reducing delusions, nor did it change subjective paranoid thinking and ideas of social reference, cognitive insight or subjective experience of cognitive biases and metacognitive beliefs. In addition, the economic analysis was not in favour of MCT + TAU.

In order to elucidate this lack of efficacy we investigated two modules directed at reducing jumping to conclusions (JTC) and at improving Belief inflexibility (BI). By means of two single-arm investigations, we tested the effect of MCT module 2 (on JTC: $n = 38$) and MCT module 3 (on BI; $n = 32$); this study is described in **chapter 5**. The one-hour training sessions had no significant effect on modifying either JTC or BI. This study indicates that, addressing cognitive biases by means of MCT with group exercises, does not change the biases in individual patients.

Finally, in **chapter 6**, to systematically investigate the effects of MCT, a meta-analysis (including 11 studies) of the effect of MCT on delusions, JTC (data-gathering bias) and on positive symptoms was conducted. All analyses yielded small non-significant effect sizes (0.22 for delusions, 0.31 for JTC, 0.26 for positive symptoms). Corrections for publication bias further reduced the effect sizes to 0.03 for delusions and 0.21 for positive symptoms. In blinded studies, the corrected effect sizes were 0.03 for delusions and 0.22 for positive symptoms. In studies using proper intention-to-treat statistics, the effect sizes were -0.02 for delusions and 0.10 for positive symptoms. The moderate-to-high heterogeneity in most analyses suggests that processes other than MCT alone had an impact on the results. To conclude, the studies conducted so far do not support a positive effect of MCT on delusions, data-gathering, or positive symptoms. Moreover, the methodology of most of the studies was poor, and sensitivity analyses to control for methodological flaws considerably reduced the effect sizes.

Summary of results

COMET is efficacious in reducing depressive symptoms in patients with AVHs. Although the treatment module is a valuable intervention, future research should aim to replicate these findings. Additionally, based on our results, a focus on metacognitive beliefs may be a promising future direction in decreasing mood and anxiety symptoms in voice hearers. Prospective research is necessary to investigate causality. In contrast to our expectations, MCT did not prove to be efficacious in reducing delusions and related symptoms.

In **chapter 7** the main findings that are reported in this thesis are considered in the light of recent scientific literature. Theoretical implications are discussed and future directions for both research and clinical practice are considered. First, the findings regarding the efficacy of the three treatment approaches are discussed (COMET, MCT and CBTp). Second, the (partially) common mechanisms of change in different approaches are considered, being (i) changing cognitive biases, (ii) changing the accessibility of memory structures, (iii) distancing as a metacognitive ability and (iv) focus on hot cognitions. Regarding changing cognitive biases we concluded the following (i): JTC is specifically related to delusional symptoms. Overall, it seems reasonable to conclude that JTC mostly represents a trait characteristic (and to a lesser extent has state characteristics) and has not yet proven to mediate treatment response. The relatively stable impact of JTC and cognitive biases such as belief inflexibility (BI) in the onset and maintenance of psychosis may partially account for the lack of efficacy of MCT. Furthermore, following the retrieval competition account (albeit additional research is needed), making positive memory networks more accessible is a promising direction in psychotherapy (ii). Third, distancing, and (similar) self-distancing and decentering are involved as an effective mechanism of change in different forms of efficacious treatment (iii). And finally, there is evidence that addressing hot cognitions may be more beneficial than simply 'educating' patients about their symptoms or problems (iv). Our findings have implications for clinical practice. We suggest the following. *Regarding delusions:* in view of recent findings, it would be ineffective to aim to change cognitive biases whereas, in contrast, compensatory strategies could be more effective. Examples of jumping to conclusions and belief inflexibility in one's personal life and threatening situations may enhance more comprehensive learning instead of being 'simply educated' about different cognitive biases. Hot cognitions are easier accessible for cognitive modification than general examples. We recommend to make every psycho-educational element that refers to cognitive biases as personally relevant as possible.

Regarding auditory verbal hallucinations: Changing the accessibility of memory structures by making positive memories more accessible, so that they 'win' the retrieval competition in the light of a challenging situation (such as hearing a voice), is an efficacious technique in case of comorbid low self-esteem and depressive feelings. The COMET protocol has proven

to ameliorate depressive symptoms in patients that hear voices, therefore we recommend applying this technique as monotherapy or as part of an individualised tailor-made CBTp. Distancing might be beneficial to those who get too emotionally involved while hearing voices or ruminating about the intentions of others. Self-distancing, or decentering techniques (which are similar), may achieve the same effects.

Finally, we made suggestions for future research: the causal role of cognitive biases in the development of psychotic symptoms is still under debate, as is the question whether cognitive biases can be changed ('cure'). Above, we recommended further examination of the added value of *compensatory strategies* that help to increase metacognition in order to 'bypass' or overcome cognitive biases ('care' or compensatory strategies). However, in our opinion, currently there is insufficient evidence that cognitive biases can be changed and can act as mediators for a beneficial treatment result. Consequently, they are not (yet) a candidate target for treatments. In order to finalise this debate, further meta-analytic research on the causal role of cognitive biases on delusions (and AVHs) is required. Furthermore, despite the admirable pioneering work of the developers of MCT, we feel that group MCT has not proven to be the successful intervention that was hoped for. Future research should aim to identify key elements (mediators) of efficacious treatments. Hopefully this should lead to modular (yet highly individualised) CBT protocols based on case formulation, including working elements with regard to all aspects of delusions and AVHs. These elements can include, for example, self-esteem, dysfunctional (metacognitive) beliefs, psycho-education about cognitive biases, or promoting the bypassing of cognitive biases. Regarding COMET, more randomised controlled trials are necessary to promote adoption of the COMET guideline.