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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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Chapter 7

General discussion

Introduction

This thesis focuses on cognitive biases and (problems associated with) metacognition and their contribution to the latest psychological treatment options for patients with auditory verbal hallucinations (AVHs) and delusions.

Cognition and metacognition have been defined in different ways by different groups. This chapter starts by presenting a definition of the concepts used in this thesis and a description of recently developed treatment strategies. Then, the main results of the studies in this thesis are discussed, implications for both research and clinical utilisation are addressed, and suggestions are made for further research.

Definitions and central concepts

Beliefs in hallucinations are thoughts referring to the voices heard (i.e. verbal hallucinations): they can be about their origin, intentions and/or estimated power. Delusional beliefs are beliefs about others, or events, and provide an (dysfunctional) explanation for acts and events that are, in general, not shared by others.

Examples of such beliefs are: *'my voice is trying to hurt me'* and *'my co-worker is trying to get me fired'*. These beliefs are the main focus in traditional cognitive behavioural therapy for psychosis and are active on different levels, as formulated by Beck (1967):

- Automatic thoughts are defined as the most superficial level of cognition. These are the spontaneous thoughts that pop up in a particular situation.
- Intermediate beliefs are defined as often unarticulated attitudes, rules, expectations, or assumptions (conditional statements).
- Core beliefs are the most entrenched and inner level of beliefs. The core beliefs of well-adjusted individuals allow them to interpret, appraise, and respond to life events in realistic and adaptive ways. When dysfunctional, core beliefs represent distortions of reality and tend to be global, rigid, and overgeneralised (e.g., 'In the end, no one can be trusted').

John suffers from paranoia. Every time he sees someone staring at him in the supermarket he thinks 'they must be after me'. He gets frightened and hurries back home. On an intermediate level he is convinced that if you let anyone get close to you they might harm you. His core beliefs involve a deeply rooted and paranoid conception of the fellow man as an aggressor and the self as a potential prey

Metacognitive beliefs are beliefs about the mental processes themselves. Cartwright-Hatton and Wells (1997) further categorised metacognitive beliefs and processes as follows: 1) positive beliefs about worry, 2) negative beliefs about thoughts concerning uncontrollability and danger, 3) cognitive confidence (assessing confidence in attention and memory), 4) negative beliefs concerning the consequences of not controlling thoughts, and 5) cognitive self-consciousness (the tendency to focus attention on thought processes).

John never doubts his judgement. After his therapist asks him about the credibility of his thoughts, John says: 'I know that what I think is the truth, always...'

Cognitive biases are systematic errors and/or tendencies in thinking that affect decisions and judgements. Examples are jumping to conclusions (JTC) in psychotic disorders, and selective attention for fear-inducing stimuli in anxiety disorders.

Because of his fear of rejection John is always aware of frowns and the shaking heads of people in his vicinity. Since he is over-focused he will see what he expects to see: people rejecting him.

Recently developed treatment strategies

Cognitive behavioural therapy for psychosis (CBTp) focuses on thoughts, emotions and behaviour and explores how convictions have risen, and how they relate to negative feelings and behaviour. Challenging thoughts, distancing from emotions, and experimenting with new behaviour or doing behavioural experiments to test hypotheses, are common techniques in CBTp (Beck, Rush, Shaw, & Emery, 1979).

In the past decade, research on the onset and maintenance of psychotic symptoms has increasingly focused on both *metacognitive beliefs and metacognition* (Morrison et al., 2007a; Morrison & Wells, 2003), and on *cognitive biases* (Garety et al., 2005; So et al., 2012). Following research findings, clinical practice was adjusted and modified and, as a result, new CBT-based treatment modules were developed, such as Metacognitive Training (MCT) for paranoia/delusions (Moritz and Woodward (2007) and Competitive Memory Training (COMET) for AVHs (van der Gaag and Korrelboom (2010).

MCT is based on the premise that cognitive biases associated with the onset and maintenance of psychotic symptoms can be ameliorated by bringing them into the awareness of the

patient (metacognitive knowledge) and that knowledge about these biases can indirectly improve psychotic symptomatology (Moritz & Schneider, 2016).

COMET is based on the idea that memory networks with events, emotions and states of self are hierarchically ordered in memory. In patients, recollecting positive networks is overlearned by eliciting them several times each day so that they become more easily accessible than the networks that involve negative feeling and self-depreciation. In other words, COMET is based on principles of competing memory networks of both a positive and negative nature, and aims to make positive networks more accessible in order to make them 'win' the retrieval competition (Brewin, 2006; Korrelboom et al., 2011). Furthermore, COMET encourages changes in metacognitive beliefs, such as the perceived danger of voices, by incorporating distancing techniques (Korrelboom, 2015).

This thesis focuses on the main clinical question: to what extent do these newly developed treatment modules add to the current state-of-the-art, i.e. CBTp.

More specifically, the following questions have been addressed:

With regard to auditory verbal hallucinations (AVHs):

- 1) What is the value of metacognitive beliefs compared to beliefs about voices in explaining differences in levels of depression and anxiety in patients with AVHs?
- 2) What is the relevance of impacting on the accessibility of memory networks in depressive symptoms in patients with AVHs? (Efficacy study of COMET)

With regard to delusions:

- 3) Is metacognitive training able to reduce delusions and paranoia in patients with schizophrenia spectrum disorders? (RCT)
- 4) Can cognitive biases, such as jumping to conclusions and belief inflexibility, be influenced by targeted training?
- 5) Is metacognitive training able to reduce delusions and paranoia, data-gathering and positive symptoms in patients with schizophrenia spectrum disorders (Meta-analysis)

Results: summary

The research in this thesis yielded the following results:

Auditory verbal hallucinations

Using a cross-sectional design, the study described in **chapter two** examined i) the relationship between metacognitive beliefs (regular/cognitive) and ii) beliefs about voices and their hypothesised relationship, and levels of depression and anxiety in psychotic patients

with auditory verbal hallucinations ($n = 77$) (van Oosterhout, Krabbendam, Smeets, & van der Gaag, 2013). 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 three**, in an RCT including 77 participants, competitive memory training (COMET) was compared with treatment as usual (TAU) (van der Gaag, van Oosterhout, Daalman, Sommer, & Korrelboom, 2012). 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 (Korrelboom, 2015; Korrelboom, de Jong, et al., 2009; Korrelboom et al., 2011; Korrelboom, van der Weele, et al., 2009). 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 four**, a comparison was made between MCT + TAU and TAU alone in an RCT with 154 participants (van Oosterhout et al., 2014b). 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 five** (van Oosterhout et al., submitted). 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 six**, 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 (van Oosterhout et al., 2016). 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.

Discussion

Some results were in line with our hypotheses, whereas others were in contrast to our preliminary expectations. Therefore, further investigation may help to elucidate these findings.

Below, we first discuss the findings regarding the efficacy of the three treatment approaches (COMET, MCT and CBTp). Then, the (theoretical) mechanisms related to therapeutic changes are explored and the clinical consequences assessed. Finally, suggestions are made for future research.

Efficacy of MCT, COMET and CBTp

The efficacy of group MCT has been much debated. Although our findings were mainly negative, other research has yielded (at first glance) more positive results. For example, in a meta-analysis, Eichner and Berna (from the same group as the developers of MCT) found small-to-moderate effect sizes for MCT on delusions and positive symptoms of schizophrenia (Eichner & Berna, 2016). However, these results are partially the result of more extensive inclusion criteria which, in our opinion, seems rather inappropriate given the relatively early phase of MCT and the considerable qualitative differences between the available studies. Furthermore, the authors concluded that, when potential biases were considered, the effect on delusions was reduced but still significant. This is in contrast to the data in their supplementary table which states that, considering all studies with low risk, the effect on delusions was non-significant (Hedge's g : 0.35; $p = .14$). The authors' definition of 'low risk' involved studies at low risk of bias with regard to incomplete outcome data, randomisation and masking, while studies were regarded to be at 'high risk' if at least one of the above factors was considered to be at high risk of bias.

In another meta-analysis, Jiang et al. (2015) stated that different factors allow to come to a conclusion about the effectiveness of MCT, i.e. the limited number of RCT trials, the variability of the method and time of the outcome evaluation, and the methodological problems in the trials. The authors pleaded for more randomised trials that use standardised outcome measures and intention-to-treat analyses and concluded that the follow-up of participants is required at regular intervals after the intervention.

To conclude: Three meta-analyses are available that provide very similar results; they lead us to the conclusion that MCT has not convincingly been proven to be efficacious.

COMET has proven to be an effective treatment for low self-esteem in patients with anxiety disorders (Staring et al., 2016), depressive disorders (Korrelboom, Maarsingh, & Huijbrecchts, 2012) and personality disorders (Korrelboom et al., 2011), as well as in older patients with depressive rumination (Ekkers et al., 2011), and (as concluded from our trial) in individuals with AVHs. Further larger-scale RCTs and meta-analytic designs are necessary to be able to make more robust statements on the efficacy of COMET. Nevertheless, the preliminary results are promising.

CBTp yields a significant and sustained small-to-medium effect on delusions (Mehl, Werner, & Lincoln, 2015; van der Gaag, Valmaggia, & Smit, 2014b) and hallucinations (van der Gaag et al., 2014b) compared with TAU. Also, it is more efficacious than other interventions in reducing positive symptoms (Turner, van der Gaag, Karyotaki, & Cuijpers, 2014a). Furthermore, it is effective in different stages, such as psychosis prevention (Hutton & Taylor, 2014) and in a medication-resistant phase (Burns, Erickson, & Brenner, 2014a) as well as in different forms,

such as brief versions (Naeem et al., 2016) and low-intensity protocols (Hazell, Hayward, Cavanagh, & Strauss, 2016). Therefore, we can conclude that CBTp is an efficacious treatment for both AVHs and delusions.

Theoretical consequences

MCT, COMET and CBTp present both similarities and differences with regard to the mechanisms of therapeutic change. Below, we discuss the most important mechanisms related to cognitive biases and metacognition.

Working mechanisms in MCT, COMET and CBTp

The developers of **MCT** are clear about the aims of the training (Moritz, Kerstan, et al., 2011):

'Its primary aim is to raise the patient's awareness for both the presence and dysfunctionality of cognitive distortions by means of exercises which frequently evoke cognitive biases often resulting in erroneous decisions. Thus, patients are provided corrective experiences. The relationship between cognitive biases and psychosis is continuously stressed throughout the sessions and patients are taught alternative coping and information processing strategies.'

To conclude, MCT focuses primarily on changing or impacting on cognitive biases (such as JTC and BI).

COMET has several aims. It is a transdiagnostic imagery training protocol to learn to feel (experientially) what you already know (intellectually), and to use imagery, self-speech and body posture to enhance positive self-esteem in situations that usually elicit negative self-esteem (Korrelboom et al., 2011; Korrelboom et al., 2008; Korrelboom, van der Weele, et al., 2009). More specifically, a central element is the training in counteracting and bypassing a mood-congruent memory bias (Bradley, Mogg, & Williams, 1995; Gaddy & Ingram, 2014). Furthermore, as a key element, COMET re-introduces distancing (Beck & Greenberg, 2005), a technique used to enable patients to take a 'bird's-eye' view of the process of (in this case) hearing voices, in order to reduce emotional impact.

A key element of **CBTp** is an explicit focus on altering dysfunctional beliefs and coping strategies. Furthermore, similar to COMET, CBTp also encourages *distancing* from emotional and cognitive process, thereby implicitly stimulating activation of metacognitive knowledge and restructuring of metacognitive beliefs.

Further analysis of these three protocols also revealed specific differences: hot cognitions (Ellis, 1994; Lazarus, 1994), or appraisal or evaluative cognitions, are used to define how cold cognitions (knowledge) are processed in terms of their relevance to an individual's personal

well-being. These hot cognitions are more easily accessible for cognitive modification than general examples and exercises. Our study led us to conclude that the MCT group protocol had more elements of ‘cold’ cognition (transferring knowledge) compared with COMET and CBTp, both of which impact on a more personally relevant and ‘hot’ level. In MCT, the training exercises may be too general and non-individualised to achieve a therapeutic effect. For example, in one of the exercises patients are asked to repeatedly make guesses and report their level of certainty regarding the identification of a gradually completed drawing (in eight steps). In this exercise, countering hasty decision-making, patients are encouraged to (re-) consider alternatives and be receptive to the opinions of others. From a therapeutic point of view, it is debatable whether this is a truly corrective experience, or more a ‘fun quiz’ that ceases to become personally relevant; this may also explain some of the differences in efficacy. Table 7.1 presents a summary of the main differences between the three protocols.

Table 7.1 Mechanisms of change in CBTp, MCT and COMET

	CBTp	MCT	COMET
Changing cognitive biases such as JTC and BI		++	
Changing the accessibility of memory structures			++
Distancing as a metacognitive ability	+		+
Focus on hot cognitions	++		++

+ present; ++ clearly present.

The following sections discuss these mechanisms.

Changing jumping to conclusions (JTC) and belief inflexibility (BI)

In their meta-analysis, Dudley et al. (Dudley, Taylor, Wickham, & Hutton, 2016) found that people with non-affective psychosis require less evidence to make decisions and are more likely to make extreme decisions, than both healthy participants and participants with other types of mental health issues. More specifically, they found that those with current delusions require less information. They accept Garety and Freeman’s (2015) suggestion that the JTC bias may act as a (neither sufficient nor necessary) ‘trait representing liability to delusions’ and yet, following the Bradford Hill criteria (Hill, 1965), could not confirm its causal role. In another meta-analysis So et al. (So, Siu, Wong, Chan, & Garety, 2016) confirmed the psychosis-specific nature of JTC. In recent work, McLean et al. found only *indirect* evidence that cognitive biases play a causal role in delusion formation (McLean, Mattiske, & Balzan, 2017). What they did find, however, similar to Dudley et al. (2016), is that groups with schizophrenia who were currently experiencing delusions showed greater JTC than groups with schizophrenia who were *not*

Table 7.2 Clinical examples of the key elements

Changing cognitive biases such as JTC and BI	<p>John tends to hastily jump to conclusions. Yesterday he sent a text to his gym buddy. Despite being online, the gym buddy did not respond to John's message. After an hour or so, John concluded that his friend didn't want to see him any more and, out of anger, blocked his friend from the texting application.</p> <p>Beatrice (the therapist) explains to him how jumping to conclusions and hasty decision-making can be both beneficial and harmful: 'Sometimes, for instance, when you're on a pedestrian crossing and a car drives towards you at full speed, you have to quickly decide to jump back onto the sidewalk in order to save your life. But, sometimes jumping to conclusions or hasty decision-making can also get you into trouble ... If your boss asks you to do an extra task while you're already stressed out and you assume he does this to test you and, as a response, you call him names, that won't be very beneficial ... So, to conclude, what kind of alternative conclusions can you draw from your friend not picking up the phone?'</p>
Changing the accessibility of memory structures	<p>In COMET, Mary would be encouraged to challenge her degrading voice by actively addressing positive memory networks regarding success, pride and belonging, so that negative memory networks regarding shame and humiliation would be deactivated. The therapist would ask Mary to retrieve her most positive memory, for example, getting her high school degree. She would ask Mary to re-live this important moment and use self-speech and body posture to further strengthen this positive state of mind.</p>
Distancing as a metacognitive ability	<p>After he granted her permission, the Beatrice (the therapist) explains to John how the mind can work: 'You remember that we talked about 'thinking about thinking', right? You told me that sometimes your thoughts freak you out... Especially when you're really certain your neighbours are harassing you... Let's zoom out a bit and have a look at your thoughts, how they upset you... Sit next to me and look at yourself in that stressful situation, all anxious and bothered... What can you tell about your thoughts?' John responds: 'I can see myself getting upset by all those negative thoughts. I can see it's something I am partially responsible for.'</p>
Focus on hot cognitions	<p>Mary's therapist explains to her how low self-esteem can make you feel 'down and out'. Mary acknowledges that: she has seen a talk show on TV where the guests shared their experiences with having a low self-esteem and how it affected them in almost every part of their life. After that the therapist asks Mary to imagine she is at her sister's party, making an entrance. Mary closes her eyes and says: 'I feel horrible... like everyone is eyeballing me... I can see them judging me... makes me want to run away and cry... Can I stop this exercise?'</p>

currently experiencing delusions. Thus, McLean et al. demonstrated no more JTC than in healthy control groups. It seems that JTC co-varies with delusions in cross-sectional samples of people with schizophrenia. Furthermore, McLean et al. concluded that JTC is associated with delusions across a range of diagnoses. Groups with other, non-delusional psychiatric illnesses demonstrated i) less JTC than groups with schizophrenia currently experiencing delusions, ii) less JTC than groups experiencing delusions due to other diagnoses, and iii)

no more JTC than healthy control groups. To conclude, similar to So et al. (2016), McLean et al. found that JTC is not associated with psychiatric illnesses in general.

Ross et al. (2015) found that individuals with higher levels of delusion-like experiences tend to reach a decision more hastily; their overall effect size is small and exhibits moderate heterogeneity. Garety et al. (2015) conducted a randomised experimental study in which 101 participants with current delusions and schizophrenia spectrum psychosis were randomly allocated to a brief (computerised) reasoning training intervention, or to a control condition involving computer-based activities of similar duration. The authors found significant effects of the reasoning training on data-gathering, especially at follow-up. However, in the mediation analyses they found no evidence that JTC mediated a reduction in paranoia. Similarly, in another trial by Ross et al. (2011), 34 persons with delusions were randomly assigned to either attention control condition or to a reasoning training. Although the latter group significantly improved in JTC, the mediation hypothesis could not be confirmed. Another interesting finding of this latter trial is that those with extreme levels of JTC did not benefit from the reasoning training: the amount of improvement depended on the baseline level. In an experience sampling study (Ludtke et al., 2017), fluctuations of JTC were measured. No firm conclusions on the temporal stability of JTC could be drawn. The authors found preliminary evidence for strong fluctuations on the patient level for a subset of participants; on the other hand, in general, they also found JTC to be stable over a short period of time.

To conclude, JTC is specifically related to delusional symptoms. However, it has not been consistently proven that by ameliorating JTC the symptoms of delusions also ameliorate. Furthermore, those with extreme responding styles are not likely to change in their tendency to jump to conclusions. Overall, in our opinion, 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.

Belief inflexibility (BI) disallows patients to reduce plausible yet false beliefs in the light of contradicting evidence. There is evidence that BI can be found in different phases of psychosis development and can be regarded as a cognitive marker of the beginning psychotic state. It is also suggested that BI is particularly important in the maintenance of already formed beliefs, potentially strengthening delusional conviction when they have already developed. In a 2017 meta-analysis (Zhu, Sun, & So, 2018) it was found that BI was robustly associated with delusions, with a particularly strong association for delusional conviction. In contrast, Ward, Peters, Jackson, Day, and Garety (2018) unexpectedly found that BI showed no significant difference between a clinical group, a non-clinical (but with psychotic experiences) group, and a control group. Furthermore, Garety et al. reported that BI (partially) mediated treatment response at follow-up (Garety et al., 2015). So et al. (2012) found both JTC and BI

to be relatively stable over time: whereas conviction may change, inflexible ways of thinking or limited data-gathering do not improve as the delusional conviction reduces. The relatively stable impact of cognitive biases in the onset and maintenance of psychosis may partially account for the lack of efficacy of MCT. We cannot expect stable risk factors to change over a relatively short period of time and they are not a candidate for treatment focus.

Changing the accessibility of memory structures

In his 2006 paper, Brewin (2006) provides a summary of the support for his account of memory retrieval. The paper deals with two opposing views concerning changing memory. One states that interventions, such as supplying disconfirming information or conducting psychological therapy, can result in a permanent change in the underlying memory representation. The alternative view is that memory representations cannot be permanently altered, and that such interventions create new memories that leave the original ones intact. Whether the old or more recently acquired memories determine behaviour is decided through a process of retrieval competition, with the most accessible memory having the greatest influence. Therapeutic techniques based on this theory, such as COMET, have proven feasible and (on a small scale) also effective (Korrelboom, 2015; Korrelboom, de Jong, et al., 2009; Korrelboom et al., 2012; Korrelboom et al., 2011; van der Gaag et al., 2012), and the retrieval competition is presented as one of the working mechanisms for imagery rescripting (Dibbets & Arntz, 2016; Muller-Engelmann & Steil, 2017). For example, there are indications that imagery rescripting may be beneficial in PTSD, even though it does not involve fully recontextualising the initial perceptual memory representation and, instead, focuses on encoding a new, less distressing representation (Morina, Lancee, & Arntz, 2017). To conclude, following the retrieval competition account (albeit additional research is needed), making positive memory networks more accessible is a promising direction in psychotherapy.

Distancing as a metacognitive ability

Beck introduced the term 'distancing' to describe the process of gaining objectivity toward thoughts (Beck, 1970). More specifically, distancing involves learning to distinguish between reality and thoughts, and that only thinking something does not necessarily imply that it is true. It is also generally believed to be a necessary step before the patient can successfully consider alternative explanations for having a particular thought (Hofmann, Sawyer, & Fang, 2010). This kind of perspective taking can be considered a metacognitive task: it requires (higher-level) mental processes, instead of the content of thoughts. With his S-REF model, Wells et al. (Wells & Matthews, 1996) were one of the first to further elaborate high-order mental processes (metacognition) in a model that explains emotional disorders. In their groundbreaking paper, the authors suggest that training in 'detached mindfulness' which

facilitates the development of metacognitive skills of evaluating one's style of thinking without triggering full-blown perseverative self-focused processing, is advisable early in treatment, particularly when preoccupation is strong. Metacognitive therapy (developed in line with the S-REF model) has proven efficacious in the treatment of generalised anxiety disorder (GAD) (van der Heiden, Muris, & van der Molen, 2012a). The term 'self-distancing' is similar to distancing but more extensive: it was found that people can adopt a 'self-distanced' perspective. In doing so, they observe and analyse their experience from an external observer's point of view. One way a person can adopt a self-distanced perspective is by changing the internal dialogue to refer to the self with the word 'you', or one's own name (Kross & Ayduk, 2008; Kross et al., 2014). Pilot research found self-distancing to be a feasible technique, and studies have yielded positive (preliminary) results in patients with recurrent depressions (Travers-Hill, Dunn, Hoppitt, Hitchcock, & Dalgleish, 2017) and with bipolar disorder (Hill, 2016).

Finally, both mindfulness and Acceptance and Commitment Therapy (ACT) have elements of distancing from cognitive processes within them. In ACT the acquisition of less defensive and more flexible styles of dealing with difficult thoughts, feelings, or sensations that reduces their harmful effects on behaviour regulation is encouraged (Hayes, 2016). Compared to CBT, ACT has proven to be equally effective in increasing depression and anxiety disorders (Hacker, Stone, & MacBeth, 2016) and tentative efforts have been made to introduce this form of therapy to patients with psychotic symptoms (Gaudio et al., 2017). Similar to distancing, in mindfulness-based treatment a key therapeutic mechanism is 'decentering'. Decentering is a metacognitive capacity of individuals to observe items that arise in the mind (e.g., thoughts, feelings, memories, etc.) as mere psychological events (Fresco, Moore, et al., 2007; Fresco, Segal, Buis, & Kennedy, 2007; Segal, Williams, & Teasdale, 2002). Mindfulness-based treatment appears to be efficacious for relapse prevention in those with recurrent depression, particularly individuals with more pronounced residual symptoms (Kuyken, Warren, Taylor, & et al., 2016).

To conclude, distancing, and (similar) self-distancing and decentering are involved as a mechanism of change in different forms of efficacious treatment.

Focus on hot cognitions

Hot cognitions (or appraisal or evaluative cognitions) are used to define how cold cognitions (knowledge) are processed in terms of their relevance to one's personal well-being (Ellis, 1994; Lazarus, 1994). There is evidence that 'hot' and 'cold' cognitions are processed differently (Schaefer et al., 2003) and that clinical improvement is associated with changes in neural circuits that are responsible for 'hot' emotional processing (Perez et al., 2016). This (tentatively) indicates that these changes mediate treatment response and emphasises the importance of addressing personally relevant ('hot') cognitions. More recently, in psychosis research there

is increasing interest in emotion-processing deficits as potential vulnerability markers for psychosis. Furthermore, preliminary evidence indicates that treatment interventions aimed at improving cognitive control of emotion could improve functioning and reduce psychotic symptoms (Tully & Niendam, 2014). This indicates that clinical improvement is associated with increased control over ‘hot’ emotions. On the other hand, psycho-education (aimed at changing ‘cold’ cognitions) was only efficacious at a ‘trend’ level in changing insight in patients with psychotic symptoms (Pijnenborg, van Donkersgoed, David, & Aleman, 2013), which indirectly stresses the importance of addressing ‘hot’ knowledge.

To conclude, there is evidence that addressing hot cognitions may be more beneficial than simply ‘educating’ patients about their symptoms or problems.

Clinical implications

Analysis of possible mechanisms of therapeutic change resulted in the following clinical guidelines.

Bypassing and not changing cognitive biases (delusions)

Although cognitive biases, such as JTC and BI, are mainly associated with delusions, the causal role of cognitive biases in the development of delusions is still debated, as is the question as to whether cognitive biases can be changed (‘cured’). In view of recent findings, it would be ineffective to aim to change these biases whereas, in contrast, *compensatory strategies* could be more effective. In an influential study, Koren et al. (2006) propose a model to elucidate the mechanisms bridging cognitive functioning and functional outcome. The authors consider metacognition as a critical bridge between these two factors. Metacognition is successively subcategorised into 1) an element of self-assessment (awareness of cognitive problems), and 2) an element of self-direction (adequate coping behaviour). In other words,

After ten sessions of CBTp John has gained insight into his problematic way of hastily jumping to conclusions: ‘I do this all the time and it gets me into trouble’. Beatrice explains to him: ‘You’ll probably always tend to easily jump to conclusions. But it’s great that you are now aware of it! This could keep you out of a lot of trouble. Maybe we could try something new: how about every time you jump up and want to confront people, you send me a text message? After that, you can wait until I get back to you so we can figure the situation out... then, you can always decide how to act upon that particular situation. How do you feel about that?’

being aware of (neuro-) cognitive problems, and adjusting behaviour as a result, may lead to better functional outcome. It is possible that similar mechanisms are involved in cognitive biases. However, in the absence of any firm conclusions regarding the changeability of relevant cognitive biases, we think that (similar to Koren et al. 2006) it is safer to ‘offer a walking stick’ rather than trying to ‘cure the crippled leg’.

Get to the good stuff (AVHs)

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.

Keep your distance (AVHs + delusions)

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. As a result, patients might come to more functional metacognitive beliefs such as ‘*I’m not always right*’ or ‘*These are just thoughts*’. It is recommended to help patients to explicitly verbalise this metacognitive knowledge in order to generalise this information to other similar situations.

After a distancing exercise, Beatrice asks: ‘What can you tell me about your thoughts?’ John responds: ‘I can see myself getting upset by all those negative thoughts. I can see it’s something I’m partially responsible for’. Beatrice: ‘What can you tell about the nature of your thoughts?’. John: ‘It’s just a thought, not a fact’.

Heat it up (delusions)

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. These hot cognitions (Ellis, 1994; Lazarus, 1994), or appraisal or evaluative cognitions, are used to define how cold cognitions (knowledge) are processed in terms of their relevance to one’s personal well-being. 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.

Future research

Changing cognitive biases

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.

Efficacy studies

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.

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