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Pathways to change in one-session exposure with and without cognitive intervention: An exploratory study in spider phobia

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ABSTRACT

It is well established that exposure therapy is an effective treatment for anxiety disorders. It is less clear, however, which mechanisms are crucial in explaining its success. In previous studies, cognitive change has been identified as a mediating variable. Several theorists have argued that the addition of cognitive interventions will, therefore, result in enhanced treatment effects. We tested this hypothesis by examining cognitive mediation of treatment in a purely behavioral versus a cognitive–behavioral exposure format. Thirty-one spider phobics were randomly assigned to either behavioral exposure or to exposure as a test for maladaptive cognitions (i.e., behavioral experiments). Both treatment formats showed large treatment effects and strong cognitive mediation of these effects. This indicates that, even when cognitions are not explicitly targeted, exposure effects are cognitively mediated. This challenges the idea that cognitions have to be explicitly challenged to elicit cognitive change in exposure treatment.

1. Introduction

There is a consensus that cognitive processes are crucial in development and maintenance of anxiety disorders (Clark, 1999). Therefore, it seems plausible that changing maladaptive cognitions will change the severity of fear or anxiety symptoms. Indeed, several studies have shown that cognitive change mediates treatment outcome, in the sense that changes in maladaptive cognitions precede and explain reductions in social phobia (Hofmann, 2004; Smits, Rosenfield, McDonald, & Telch, 2006; Vögele et al., 2010), panic disorder (Hofmann et al., 2007) and agoraphobia (Vögele et al., 2010).

As a consequence, researchers and therapists generally agree that maladaptive cognitions should be changed during therapy. Furthermore, some authors argue that if the mechanism of change (i.e., change in cognitions) is directly targeted (i.e., through cognitive interventions), treatment effects will be larger (Clark, 1999; Rachman, 1997). Several empirical studies confirm that the use of cognitive interventions (slightly) enhances treatment outcome (Bryant et al., 2008; Clark et al., 2006; Mattick, Peters, & Clarke, 1989; McMillan & Lee, 2010; Salkovskis, Hackman, Wells, Gelder, & Clark, 2007). Other studies, by contrast, have not found enhanced treatment effects when cognitive interventions were added to a behavioral treatment (Feske & Chambless, 1995; Koch, Spates, & Himble, 2004; Whittal, Thordarson, & McLean, 2005).

We see several explanations for these inconsistent results. One possibility is that treatments with and without cognitive interventions entail different mechanisms of change which, however, lead to similar treatment effects. For example, it might be that addition of cognitive restructuring, depending on how it is implemented within treatment, lowers the threshold for subsequent exposure (with cognitive change preceding changes in behavior tendencies) or focuses attention on maladaptive cognitions during exposure (with exposure functioning as an 'experiment' for certain cognitions). On the other hand, a purely behavioral treatment might primarily target behavioral tendencies such as avoidance, which in turn leads to cognitive change. In this line of reasoning, the measures that are used to index treatment success, as well as the timing of this measurement, can influence the treatment effects that are found.

Another possible explanation is that treatments both with and without cognitive interventions are successful because they target the crucial underlying cognitions to a similar extent. Differences between studies can then be explained through differences in within-study control of therapy time (Bryant et al., 2008) or in the way in which exposure is combined with cognitive interventions (administered together or separately). Also, there might be

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differences in the extent to which different anxiety disorders are suitable for exposure (e.g., exposure to spiders might get more to the core of spider phobia than exposure to physical sensations does in panic disorder) or cognitive interventions (e.g., a Socratic dialogue might be more effective in the context of PTSD than in the context of specific phobia).

In relation to this argument, Rauch and Foa (2006) stated that treatments need to activate the patient's fear structure sufficiently to be successful. In our opinion, it is plausible that sufficiency, necessity, and relevance of different (e.g., cognitive and behavioral) treatment components in activating the fear structure differs between and within anxiety disorders (e.g., individual differences). Therefore, we believe that it is important to examine the impact of cognitive interventions in exposure treatment separately for different types of anxiety disorders.

Specific phobia is one type of anxiety disorder that is characterized both by maladaptive behavioral tendencies and maladaptive cognitions. Spider phobics strongly hold the belief that spiders are dangerous (Arntz, Lavy, van den Berg, & Rijsoort, 1993). Furthermore, research has indicated that these beliefs entail a high truth-value, in the sense that they are not readily recognized as irrational or excessive (Jones & Menzies, 2000). These cognitions can also present themselves at an indirect, less accessible level of processing (Teachman, Gregg, & Woody, 2001; Teachman & Woody, 2003).

In the context of spider phobia or animal phobia in general, several studies have already compared behavioral treatment (exposure) to cognitive–behavioral treatment (exposure with cognitive interventions) (e.g., Artnz & Lavy, 1992; Koch et al., 2004). These studies found no differences between both versions of exposure, nor in general treatment effect, nor in the amount of cognitive change that was established (Koch et al., 2004). This suggests that the addition of cognitive interventions does not result in additional benefits.

A further question, however, is whether both versions of treatment are successful through addressing maladaptive cognitions. The aim of the present study is to investigate this question in the context of spider phobia. Spider phobia is a common type of specific phobia (e.g., Stinson et al., 2007) with a high treatment response to exposure in various formats (e.g., Koch et al., 2004; Hellström & Öst, 1995; Öst, 1989, 1996).

A suitable method to directly compare purely behavior and cognitive–behavioral treatments is using behavioral experiments (see Longmore & Worrel, 2007; McMillan & Lee, 2010). In a behavioral experiment (BE), important (maladaptive) cognitions are identified and subjected to a (real-life) test, while alternative cognitions are constructed (Rouf, Fennell, Westbrook, Cooper, & Bennett-Levy, 2004). As such, BEs use exposure as a way to test and change cognitions. Through comparing a full behavioral experiment (i.e., with cognitive restructuring) with purely behavioral exposure, one can investigate whether behavioral experiments benefit from explicit cognitive interventions (Longmore & Worrel, 2007; McMillan & Lee, 2010).

In the present study, thirty-one spider phobics were randomly assigned to either a behavioral experiment (BE) condition or an exposure-only (EXP) condition. Both treatments were delivered in a one-session treatment format. In the BE condition, exposure served to challenge maladaptive cognitions and to construct new, adaptive cognitions. In the EXP condition, exposure was performed without any form of cognitive intervention. Allocation to the BE and EXP conditions was randomized. All participants took part in three test sessions: a baseline session, a post-exposure session and a one-month follow-up session, on which we indexed participants' phobia severity as well as their phobia-related cognitions.

This is the first study that compares the level of cognitive mediation in purely behavioral versus cognitive–behavioral treatment of specific phobia. Previous studies have already demonstrated cognitive mediation of treatment in purely behavioral exposure formats and cognitive–behavioral treatments separately (Hofmann, 2004; Hofmann et al., 2007; Teachman, Marker, & Smith-Janik, 2008; Vögele et al., 2010). Therefore, we expect significant cognitive mediation of treatment outcome in both the BE and the EXP group. Still, as in the BE group, cognitions are directly targeted, we expect more cognitive mediation in the BE than in the EXP group. That is, although cognitive change might also be important in a purely behavioral exposure format (e.g., Vögele et al., 2010), other mediating variables such as the prevention/change in action tendencies (Wolitzky & Telch, 2009) might be more crucial in driving treatment outcome here.

2. Method

2.1. Participants

Participants were recruited via advertisements online at the website of Ghent University, via posters in the community, and via acquaintances. At the start of the baseline session, participants were screened for spider phobia with the Dutch version of the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Di Nardo, Brown, & Barlow, 1994; Dutch translation by Bouman, de Ruiter, & Hoogduin, 1995). Based on this interview, one participant did not meet the criteria for spider phobia and was excluded from further participation.

Exclusion criteria for this study were: (a) prior pharmacological or psychological treatment for spider phobia; (b) use of psychopharmacological drugs; (c) duration of spider phobia less than one year; (d) diagnosis of a psychiatric disorder other than spider phobia; (e) presence of cardiac problems. These exclusion criteria were systematically assessed by the interviewer.

Thirty-one participants enrolled in this study. All participants were minimally 18 years of age and had not received previous treatment for spider phobia. Mean age of the sample was 21.65 ($SD = 5.33$). Most participants (87.1%) were female. The sample consisted mainly of single (87.1%) people who were still studying at university or a college of higher education (96.8%). Thirteen participants (41.3%) were psychology students. There were no differences between the BE and EXP groups with regard to age, $t(29) = 1.39$, *ns*, gender, Fisher's exact test, $p = 1.00$, marital status, Fisher's exact test, $p = 1.00$, professional status, Fisher's exact test, $p = .48$, or the amount of psychology students, Fisher's exact test, $p = 1.00$.

2.2. Treatment conditions

Individual exposure treatments were conducted by a master-level clinical psychologist specifically trained in exposure treatment. One-session treatments of maximally three hours (Zlomke & Davis, 2008) were used. Treatment protocols for both formats were based on Öst (1989), with small adaptations based on recent research (Cain, Blouin, & Barad, 2004; Tsao & Craske, 2000; see Craske & Mystkowski, 2006, for an overview). The protocol mainly involved in vivo exposure, combined with modeling by the therapist. Treatment protocols for both exposure formats were approved by the ethical committee of the psychology department of Ghent University.

Exposure was performed with different spiders (one medium-sized orb-web spider and one big-sized house spider). Participants were encouraged to increasingly approach the spider. This started from looking at the spider, enclosed in a glass jar, and progressed from catching the spider with a glass and a piece of cardboard, to