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A pilot randomized clinical trial of cognitive behavioral therapy versus attentional bias modification for social anxiety disorder: An examination of outcomes and theory-based mechanisms

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ABSTRACT

No studies have compared face-to-face cognitive-behavioral therapy (CBT) and attention bias modification (ABM) for social anxiety disorder (SAD) and their purported mechanisms. We asked: 1) Is CBT more effective than ABM? and 2) Are changes in attentional biases and cognitions temporally related to symptom change? Forty-three patients were randomly assigned to 8 sessions of ABM or up to 20 sessions of individual CBT. Intent-to-treat results revealed that CBT was superior to ABM in response rates and on symptom measures at endpoint, but not on other measures. No differences were found on measures in rates of change between CBT and ABM. Frequency of negative cognitions changed in both groups and negative beliefs changed only in CBT. Attentional bias did not change in either group. Cognitive changes bidirectionally correlated with symptom change in cross-lagged analyses in CBT, but not in ABM, suggesting a reciprocal relationship. Trial-level bias away from negative faces was simultaneously related to symptom change in ABM only. Results suggest that CBT is superior to ABM when administered at their typical doses, but raise questions given the similar rates of change. In addition, results support theories of cognitive change and raise questions about changes in attentional biases in CBT.

1. Introduction

Cognitive bias modification interventions have produced variable findings, from those suggesting equivalency to CBT (e.g., Amir et al., 2009) to null results (see Liu, Li, Han, & Liu, 2017). Similarly, recent meta-analyses (Cristea, Kok, & Cuijpers, 2015; Heeren, Mogoaşe, Philippot, & McNally, 2015; Linetzky, Pergamin-Hight, Pine, & Bar-Haim, 2015; Liu et al., 2017; Mogoaşe, David, & Koster, 2014; Price et al., 2016) have come to significantly different conclusions about the efficacy of attention bias modification (ABM). However, one major question that has not been tested (see Mogg, Waters, & Bradley, 2017) is whether a first-line treatment such as standard cognitive-behavioral therapy (CBT; Mayo-Wilson et al., 2014) is superior when directly compared with ABM.

There are a number of reasons for examining ABM directly with CBT. Novel, computerized interventions may draw patients who either do not want personal interaction with a therapist or who have particular beliefs about technology and "cutting edge" new treatments (thereby leading to biases via expectancy effects and larger effects in younger participants; Liu et al., 2017; Price et al., 2016). In addition, meta-analyses have suggested that ABM administered in the lab may be more effective than administered over the internet (Heeren et al., 2015; Linetzky et al., 2015; Price et al., 2016). To date, there are only two studies which have examined CBT vs. ABM, both of them internet-based studies (Kuckertz et al., 2014; Månsson et al., 2013), thereby potentially leading to particular samples of tech-savvy participants. Both studies showed some advantage of internet-based CBT over ABM, though these studies were based on self-report measures of anxiety, small samples (n = 13 per group; Mansson et al., 2013), or lack of randomization (Kuckertz et al., 2014). We are not aware of any published, randomized studies comparing CBT vs. ABM in which both were administered in person.

The current study is a preliminary examination of the overlapping and differential mechanisms of CBT and ABM and their relative efficacy. Theoretically, ABM should be a test of a pure mechanism: attentional bias should change and be correlated with change in symptoms (e.g., MacLeod & Clarke, 2015; Price et al., 2016; but see Mogg et al., 2017 for a critique). Although the first studies of ABM as a treatment for social anxiety disorder (SAD) did not report on the relationship of changes in bias to changes in symptoms (Amir et al., 2009; Schmidt,

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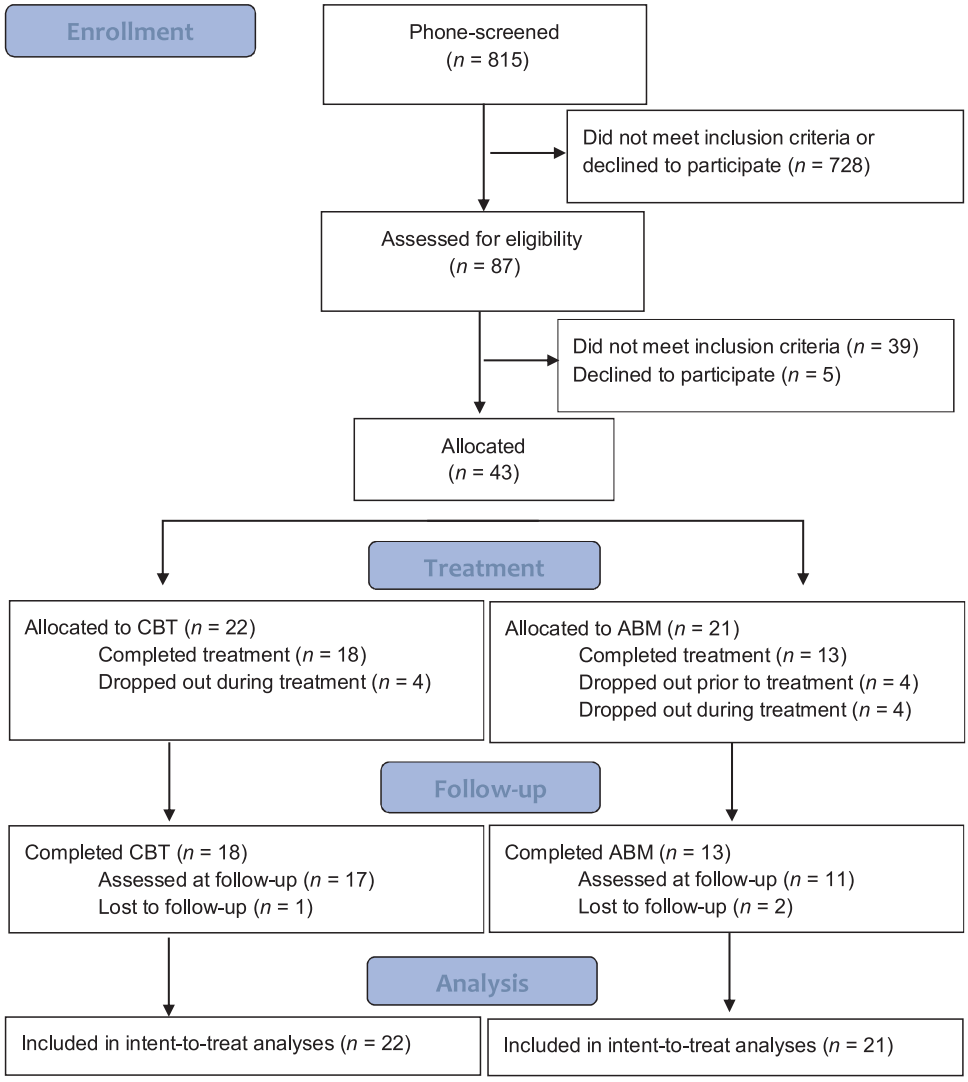

Fig. 1. Consolidated Standards of Reporting Trials (CONSORT) flow diagram for the study.

Richey, Buckner, & Timpano, 2009), a number of studies since have done so (Price et al., 2016). Indeed, MacLeod and Clarke (2015) have contended that their review of the data suggests that ABM should be effective only to the degree that there is bias change.

Attentional biases are proposed to change via CBT as well as by ABM (Clark, 2005; Morrison & Heimberg, 2013). The few studies that have examined change of bias during CBT for SAD have mixed findings, with some (e.g., Mattia, Heimberg, & Hope, 1993; Pishyar, Harris, & Menzies, 2008) finding that attentional bias decreased following CBT while others (Lundh & Öst, 2001) have not. However, prediction from traditional dot probe attentional bias scores is problematic due to low reliability (Mogg et al., 2017; Rodebaugh et al., 2016). Therefore, there have been a number of suggestions how to improve the reliability of attentional bias scores. One of the most promising procedures was offered by Zvielli, Bernstein, and Koster, (2015) who proposed examining bias by aggregating data pairs on a trial basis in order to then look at bias towards, bias away, and variability in bias. Davis et al. (2016) was the only study to date to use the more reliable, trial level bias scores and found that change in attentional bias was not related to symptom change in a brief exposure treatment. In the current study, we present the results only of trial level bias scores because traditional bias scores had low to no reliability.

According to most CBT theories of SAD (e.g., Clark, 2005; Morrison & Heimberg, 2013), change in attentional bias is one of a number of purported mechanisms of treatment. Another central mechanism is reduction of biased cognitions. In the case of SAD, decreases in belief in or frequency of negative social cognitions (e.g., "people will reject me") are suggested to be a key mechanism (see Gregory & Peters, 2017 for a review). A number of studies have used pre-post measures of cognitions and found that either positive cognitions increased or negative cognitions decreased after CBT (e.g., Chambless, Tran, & Glass, 1997; Heimberg, Bruch, Hope, & Dombeck, 1990; Heinrichs & Hofmann, 2005). However, it is still unclear whether cognitive change leads to symptom reduction or the other way around (c.f., Kazdin, 2007). Given the evidence that the emotion regulation strategy of reappraisal precedes symptom change in CBT for SAD (Goldin, Morrison, Jazaieri, Heimberg, & Gross, 2017; Goldin et al., 2014) it is important to determine whether changes in cognitions per se precede symptom change. The three studies that have examined this question to date using cross lagged analyses have found mixed results (Gregory, Wong, Marker, & Peters, 2018; Hoffart, Borge, & Clark, 2016; Mörtberg, Hoffart, Boecking, & Clark, 2015).

Thus, the current study was undertaken to examine mechanisms (attentional biases, negative cognitions) of CBT for generalized SAD in addition to comparing the relative efficacy and mechanisms of ABM. We build on previous studies by examining both "face to face" treatments, using blind, independent evaluator ratings of social anxiety, including measures of potential mechanisms of change in each