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The efficacy of cognitive-behavioral interventions for reducing anxiety sensitivity: A meta-analytic review

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ABSTRACT

The present study meta-analytically reviewed the efficacy of cognitive-behavioral therapy (CBT) vs. control conditions in the reduction of anxiety sensitivity. A computerized search was conducted to identify CBT outcome studies that included the Anxiety Sensitivity Index as a dependent variable. Of the 989 studies that were identified, 24 randomized-controlled trials with a total of 1851 participants met inclusion criteria and were included in the analysis. Data were extracted separately for treatment-seeking (16 studies) and at-risk (eight studies) samples. Results indicated large effect sizes for treatment-seeking samples, Hedges' $g = 1.40$, SE = 0.21, 95% CI: 1.00–1.81, $p < 0.001$, and moderate to large effect sizes for at risk samples Hedges' $g = 0.74$, SE = 0.18, 95% CI: 0.39–1.08, $p < 0.001$. Additionally, both the amount of therapist contact and control modality (waitlist vs. psychological control) moderated the effect sizes for treatment-seeking samples. Our review indicates that CBT is efficacious in reducing anxiety sensitivity. However, more research is needed to determine the mechanisms by which CBT exert its effects on anxiety sensitivity.

A meta-analytic review

Anxiety sensitivity (AS) refers to the fear of anxiety-related sensations (Reiss, Peterson, Gursky, & McNally, 1986). AS is a dispositional characteristic that is distinct from trait anxiety, which merely reflects a tendency to experience frequent episodes of state anxiety (McNally, 2002). Individuals with elevated levels of AS respond with fear to somatic arousal often because they believe that these sensations have harmful consequences (e.g., physical illness, social embarrassment, mental incapacitation). Although individuals with low levels of anxiety sensitivity may also experience anxiety and related sensations as unpleasant, they do not perceive them as threatening.

The Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1992) is the most widely used instrument of the construct. This self-report measure, which has sound psychometric properties both for use in clinical and nonclinical samples (Peterson & Reiss, 1992), lists 16 statements reflecting either distress about anxiety symptoms (e.g., "It scares me when I feel shaky") or concern about negative consequences of anxiety symptoms (e.g., "When I am nervous, I worry that I might be mentally ill"), and asks respondents to indicate the degree to which they agree with each statement (0 = "very little"; 4 = "very much"). The total score can range between 0 and 64.

Results of studies that have employed the ASI implicate AS in the etiology and maintenance of a number of psychiatric conditions. Specifically, cross-sectional research reveals that ASI scores are elevated among adults suffering from panic disorder and other anxiety disorders (Taylor, Koch, & McNally, 1992) as well as among individuals with diagnoses of mood disorders (Cox, Enns, Freeman, & Walker, 2001; Otto et al., 1995; Simon et al., 2005) and substance use disorders (Forsyth, Parker, & Finlay, 2003; Lejuez et al., 2006). Similarly, prospective naturalistic studies provide evidence suggesting that persons with elevated levels of AS are more likely to develop panic attacks (Maller & Reiss, 1992; Schmidt, Lerew, & Jackson, 1997) and anxiety, mood and alcohol use disorders (Schmidt, Zvolensky, & Maner, 2006). Finally, initial longitudinal work has yielded findings consistent with the hypothesis that improvements in panic disorder symptoms are mediated by reductions in AS (Smits, Powers, Cho, & Telch, 2004). Collectively, these results suggest that targeting AS may be critical for the prevention and treatment of many Axis I disorders.

Cognitive-behavioral interventions focus on the modification of maladaptive beliefs that are presumed to operate in the etiology and maintenance of psychological disorders. In treating anxiety, cognitive-behavioral therapists typically employ a combination of strategies including education, cognitive restructuring, and confrontation to the feared stimuli (e.g., exposure, behavioral

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experiments) to help the individual reappraise their perceived threats. Accordingly, these interventions should be well-suited to treat AS. An initial review of the literature conducted by Otto and Reilly-Harrington (1999) yielded 10 treatment outcome studies that had included the ASI as part of treatment outcome assessment. Of these 10 studies, four involved random allocation of patients with panic disorder to either CBT or control conditions, one involved a randomized waitlist-controlled evaluation of cognitive-behavioral treatment (CBT) for (at risk) individuals with elevated levels of AS, and five studies were open trials of either CBT or pharmacotherapy or their combination for panic disorder or major depressive disorder. Consistent with hypothesis, the findings of this review indicated that scores on the ASI declined significantly with CBT. Specifically, the weighted average of pre- to post-treatment ASI reductions for seven (controlled and uncontrolled) studies of CBT for panic disorder was approximately 14 points.

Since the publication of the Otto and Reilly-Harrington (1999) review, a number of randomized-controlled trials evaluating the reduction of AS with cognitive-behavioral interventions have been conducted. In addition to a growing body of work examining intervention-related improvements in AS among treatment-seeking samples, several studies have now examined the efficacy of cognitive-behavioral interventions specifically designed to target AS among individuals at risk (i.e., adults with elevated levels of AS). Given these advances, the purpose of this article was to update and refine the Otto and Reilly-Harrington (1999) review by determining, separately for individuals seeking treatment and individuals at risk, the efficacy of cognitive-behavioral interventions vs. control conditions in reducing anxiety sensitivity. In addition, we explored the potential moderating effects of amount of therapist contact, control modality (waitlist vs. psychological control) and publication year.

Method

Data sources

We selected randomized-controlled trials that included a version of the ASI using a comprehensive search strategy. We searched the following databases: PsycINFO, MEDLINE, and Scopus from 1986 to February 2008. The search was limited to articles published after 1986 because this was the year the ASI was developed (Reiss et al., 1986). The searches included the following terms: "anxiety sensitivity" or "fear of fear" alone and in combination with "treatment". These words were searched as "all text" (including key words, title, abstract, and MeSH subject heading terms). We also examined citation maps and used the "cited by" search tools. Additionally, we asked colleagues from countries outside the United States to identify randomized-controlled CBT trials that were either published or in press in their respective languages. Finally, we conducted manual searches in the lists of references from empirical studies, meta-analyses, and review articles as well as searches for articles currently in press.

Selection and study characteristics

We employed the following inclusion criteria: (a) participants over 18 years of age; (b) random assignment to either a cognitive, behavioral, or cognitive-behavioral intervention, as defined by employing cognitive-behavioral procedures (e.g., cognitive restructuring, confrontation to fearful stimuli) or control condition (e.g., waitlist or placebo; psychotherapy control conditions designed to control for non-specific factors were included, but active treatment conditions were excluded); (c) measurement of anxiety sensitivity with a version of the ASI (e.g., ASI; Peterson & Reiss, 1992; Reiss, Peterson, Taylor, Schmidt, & Weems, 2007, ASI-R; Taylor & Cox, 1998). Single case studies were excluded as were studies involving the examination of combined CBT and pharmacotherapy.

Data extraction

Two individuals independently extracted data on the following variables: sample source (sample of individuals seeking treatment, sample of individuals identified as at risk), target disorder, treatment type, amount of therapist contact (number of sessions multiplied by the duration of session), number of participants per condition, and year of publication (see Tables 1 and 2). Because only one study included intent-to-treat data, we limited the analyses to

Table 1
Characteristics of studies with treatment-seeking samples included in the meta-analysis

Study	Target disorder	CBT type	Control type	Treatment sample size	Control sample size	Therapist contact	ASI measure
Andersson et al. (2005)	Tinnitus	EXP + CT	WL	12	11	720	ASI-16
Andersson, Strömgren, Ström, and Lyttkens (2002)	Tinnitus	CT	WL	24	48	0	ASI-16
Beck, Stanley, Baldwin, Deagle, and Averill (1994)	Panic	CT	P-PLA	17	22	900	ASI-16
Botella et al. (2007)	Panic	EXP^{VR}	WL	12	13	540	ASI-16
		EXP^{IV}		12		540	
Carter et al. (2003)	Panic	EXP + CT	WL	14	11	990	ASI-16
Craske, Maidenberg, and Bystritsky (1995)	Panic	EXP + CT	P-PLA	16	13	300	ASI-16
Craske, Lang, Aikins, and Mystkowski (2005)	Panic	EXP + CT	WL	23	16	660	ASI-16
Gould, Clum, and Shapiro (1993)	Panic	EXP + CT	WL	11	11	0	ASI-16
		EXP + CT		9		480	
Hazen, Walker, and Eldridge (1996)	Panic	EXP + CT	WL	27	27	0	ASI-16
		EXP + CT		26		0	
		EXP + CT		26		1170	
Klein and Richards (2001)	Panic	CT	WL	11	10	0	ASI-16
Ost, Alm, Brandberg, & Breitholtz (2001)	Claustrophobia	EXP	WL	10	17	180	ASI-16
		EXP		10		300	
		CT		9		300	
Petterson and Cesare (1996)	Panic	EXP + CT	WL	14	13	360	ASI-16
Plotkin (2001)	Social	EXP	P-PLA	26	30	0	ASI-16
Schmidt et al. (1997)	Panic	EXP + CT	WL	16	16	1440	ASI-16
		EXP + CT		18		1440	
Swinson, Fergus, Cox and Wickwire (1995)	Panic	EXP + CT	WL	20	22	480	ASI-16
Telch, Lucas, Schmidt, and Hanna (1993)	Panic	EXP + CT	WL	34	33	1080	ASI-16

Note: ASI-16 = Anxiety Sensitivity Index – 16 item version; CT = cognitive therapy (no exposure component); EXP = exposure (no formal cognitive component); EXP + CT = exposure and cognitive therapy; IV = In vivo exposure; P-PLA = psychological placebo; WL = waitlist; VR = virtual reality exposure.