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Does change in distress matter? Mechanisms of change in prolonged exposure for PTSD

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ABSTRACT

Background and objectives: Clinically, many individuals persist in prolonged exposure therapy (PE) for chronic PTSD despite continuing distress during recounting of the trauma memory (imaginal exposure). Theorists suggest that distress reduction is necessary for successful treatment outcome (e.g., Foa & Kozak, 1986), while others suggest otherwise (e.g., Craske et al., 2008). This study examined clinically reliable changes in distress, relations to broad clinical outcomes, and whether homework adherence affected this relationship.
Method: In 116 patients with PTSD, first to last imaginal exposure sessions' peak and average distress was examined, calculating reliable change in distress. Homework adherence and helpfulness were examined. At post-treatment, PTSD symptoms (re-experiencing, avoidance, hyperarousal), depression, and functioning were examined.
Results: Patients exhibited a lack of reliable change in distress (64.7%) more than a reliable change in distress (35.3%). Although no difference in post-treatment PTSD diagnostic status, individuals experiencing a reliable change in distress reported lower PTSD severity (re-experiencing, hyperarousal), depression, and better functioning. Further, perceived helpfulness of imaginal homework had an indirect effect on this relationship.
Limitations: This study did not utilize a distress tolerance self-report measure; however, examined self-reported distress during imaginal exposure.
Conclusions: Results are encouraging for clinicians treating PTSD with PE, arguing that lack of reliable change in distress to the trauma memory does not result in treatment failure. Patient "buy in" to homework, rather than amount completed, was related to the process of distress reduction. Results suggest that distress reduction in imaginal exposure is not a key mechanism underlying therapeutic change in PE.

1. Introduction

Recently, there has been considerable debate over the necessity of between-session habituation in individuals undergoing exposure therapy (Baker, Mystkowski, Culver, Mortazavi, & Craske, 2010; Craske et al., 2008). Between-session habituation is often defined as the difference of peak responses to feared stimuli from first to last exposure session. Although there is a strong historical literature suggesting that between-session habituation is an indicator of successful treatment outcome (e.g., Grayson, Foa, & Steketee, 1982; Jaycox, Foa, & Morral, 1998; Kamphuis & Telch, 2000; Kozak, Foa, & Steketee, 1988; van Minnen & Hagenaars, 2002; Rauch, Foa, Furr, & Filip, 2004; Telch et al., 2004), there is a growing body of research showing successful treatment despite the lack of between-session habituation (e.g., Kozak et al., 1988; Lang & Craske, 2000; Rowe & Craske, 1988; Tsao & Craske, 2000).

At the center of this debate is emotional processing theory (Foa & Kozak, 1986; Lang, 1977, 1979; Rachman, 1980). As defined by Foa and Kozak (1986), emotional processing is the course by which new information is introduced into an existing fear structure in order to change emotional responding. In this theory, there are three indicators identifying that emotional processing has occurred: the fear structure must be activated, (as evidenced by physiological reactivity, behavioral avoidance, or by self-report distress); there is

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a decrease in fear during exposure sessions, that is, within-session habituation; and finally, there is a decrease in initial reactions to the feared stimuli across sessions, that is, between-session habituation. It should be noted that the term "habituation" is considered by some to be a misnomer and the observed reduction in distress over repeated exposures reflects a learning (extinction) rather than a non-learning (habituation) process. Regardless, the term habituation is used clinically and will be used subsequently throughout this paper. In exposure therapy, studies often show that these indicators result in better treatment outcome. Activation of fear has shown to be positively related to treatment outcome in some studies (e.g., Foa, Riggs, Massie, & Yarczower, 1995; Pitman, Orr, Altman, & Longpre, 1996), as well as within-session habituation (e.g., Borkovec & Sides, 1979; Foa & Kozak, 1986, 1997; Grayson et al., 1982; Kozak, Foa, & Steketee, 1988; Lang, Melamed, & Hart, 1970; Watson & Marks, 1971) and between-session habituation (e.g., Foa, Grayson, & Steketee, 1982; Jaycox et al., 1998; Kamphuis & Telch, 2000; Kozak et al., 1988; van Minnen & Hagenaars, 2002; Rauch et al., 2004; Telch et al., 2004).

In contrast, a growing body of research shows that fear reduction, either within or between sessions, is not imperative for better treatment outcome (e.g., Kozak et al., 1988; Lang & Craske, 2000; Rowe & Craske, 1988; Tsao & Craske, 2000). One possible explanation is the concept of distress tolerance (Craske et al., 2008). The toleration of distress may be exhibited as the ability to move in a goal-directed activity while experiencing emotional distress and the ability to withstand experiential discomfort (e.g., Brown, Lejuez, Kahler, Strong, & Zvolensky, 2005; Daughters et al., 2009). Specifically, this persistence, despite fear, may promote new secondary, inhibitory learning where original conditioned stimulus unconditioned stimulus expectancies have been disconfirmed (Craske et al., 2008). Therefore, regardless of the level of fear reduction during exposure itself, this new secondary learning underlies changes in symptom expression. The question, then, is not whether fear reduction takes place during exposure or across sessions, but rather is fear reduction *necessary* for positive treatment outcome. Although little is known about the role of toleration of distress in exposure therapy for PTSD, recent studies have shown that lower distress tolerance is associated with higher PTSD symptom severity (Marshall-Berenz, Vujanovic, & Zvolensky, 2011; Vujanovic, Bonn-Miller, Potter, Marshall, & Zvolensky, 2011; Vujanovic et al., 2013).

To date, we are aware of only three studies that have directly examined the role of between-session habituation in exposure therapy for individuals with chronic posttraumatic stress disorder (PTSD). Using cluster analysis, Jaycox et al. (1998) reported that those with a pattern of higher fear activation and gradual habituation had better post-treatment end-state functioning, particularly on lower re-experiencing symptoms, than those who had a pattern of lack of between-session habituation. Similarly, van Minnen and Hagenaars (2002) found that greater habituation between early therapy sessions, session 1 to session 2, was associated with better treatment outcome. Additionally, Rauch et al. (2004) found that between-session habituation of peak fear over the course of imaginal exposure predicted greater PTSD symptom reduction beyond the correlation between maximum anxiety during imaginal exposure and post-treatment PTSD symptoms. Thus, there is preliminary evidence for an association between-session habituation and better treatment outcome in exposure therapy for PTSD. To date, however, a majority of these studies have focused on peak distress during imaginal exposure rather than also examining average levels of distress over the entire exposure session. The van Minnen and Hagenaars (2002) examined average distress but only at session 1 and session 2. Furthermore, no studies have examined whether or not the change in distress across sessions was reliable or a clinically meaningful change, most have failed to examine clusters of PTSD symptoms, and none have examined broader social, work, and family functioning.

Notably, previous research in this area has also generally failed to look at other confounding factors potentially influencing between-session fear reduction, namely between-session homework adherence. In fact, there is a dearth of studies that have looked at homework and its relationship to treatment outcome in PTSD. Homework adherence reflects the extent to which the client completes exposure tasks outside of treatment sessions (Kazantzis, Deane, & Ronan, 2000) potentially affecting the relationship between between-session habituation and better treatment outcome. An individual with strong homework adherence has had more exposure to the fear memory, possibly affecting how much habituation occurs between sessions and ultimately affecting treatment outcome (Huppert, Roth Ledley, & Foa, 2006). In a meta-analysis conducted by Kazantzis et al. (2000), homework adherence was shown to be a significant, yet small, predictor of treatment outcome across anxiety disorders ($r = .22$). Although this displays a consistent association between homework adherence and outcome, very little research has specifically examined the relationship among homework adherence, between-session fear reduction, and treatment outcome in individuals undergoing exposure therapy for PTSD. We are aware of only two studies in individuals with PTSD (van Minnen & Hagenaars, 2002; Vaughan & Tarrier, 1992). In one, more self-directed exposure (i.e., imaginal exposure homework) was related to greater reduction of anxiety both after and between exposure sessions; however, they did not directly examine the effect of homework on treatment outcome. In the other (van Minnen & Hagenaars, 2002), a limited measure of homework compliance was not associated with clinical improvement.

In many respects, imaginal exposure in the treatment of chronic PTSD is an excellent test case of the differential role of between-session habituation and the lack of between-session habituation on treatment outcome, as it utilizes a relatively consistent exposure task, imaginal exposure to the trauma memory, over the course of sessions and homework. Specifically, in the present study, we examined reduction of distress over the course of imaginal exposure, which occurred from session 3 (first imaginal exposure session) to session 10 (last imaginal exposure session). The first and last imaginal exposure session was chosen as the whole trauma memory is recounted during these sessions; whereas in intervening sessions the focus shifts to what are called "hot spots" and the full memory is not usually recounted. Distress reduction was measured by Subjective Units of Distress (SUDs, Wolpe & Lazarus, 1966), which measures self-reported distress levels on a scale from 0 to 100. SUDs ratings were taken approximately every 5 min during the imaginal exposure sessions, over 30–45 min exposure sessions. Between-session habituation was operationalized as a reliable reduction (Jacobson & Traux, 1991) in distress (SUDs) from the first to the last imaginal exposure session completed. We examined a change in both peak and mean SUDs ratings, in order to examine both maximum and average distress. Based on exposure therapy for PTSD being an effective treatment for PTSD and between-session habituation being hypothesized as critical mechanism in emotional processing theory, we hypothesized that a reliable change in distress would be more prevalent than not. We further hypothesized that those who had a reliable change in distress would be less likely to meet criteria at post-treatment for PTSD than those who did not. We hypothesized that individuals who exhibited a reliable change in distress would also be more likely to have better treatment outcome as measured by reduction in PTSD severity, PTSD symptom clusters (re-experiencing, avoidance, and hyperarousal), and other trauma-related