



Does engagement with exposure yield better outcomes? Components of presence as a predictor of treatment response for virtual reality exposure therapy for social phobia

Matthew Price^a, Natasha Mehta^b, Erin B. Tone^b, Page L. Anderson^{b,*}

^a National Crime Victims Center, Medical University of South Carolina, 550 Harbor Cove Lane, 1000X, Charleston, SC 29412, USA

^b Department of Psychology, Georgia State University, 140 East Decatur St., Atlanta, GA 30303, USA

ARTICLE INFO

Article history:

Received 24 October 2010

Received in revised form 5 March 2011

Accepted 8 March 2011

Keywords:

Social anxiety

Virtual reality exposure

Presence

ABSTRACT

Virtual reality exposure (VRE) has been shown to be effective for treating a variety of anxiety disorders, including social phobia. Presence, or the level of connection an individual feels with the virtual environment, is widely discussed as a critical construct both for the experience of anxiety within a virtual environment and for a successful response to VRE. Two published studies show that whereas generalized presence relates to fear ratings during VRE, it does not relate to treatment response. However, presence has been conceptualized as multidimensional, with three primary factors (spatial presence, involvement, and realness). These factors can be linked to other research on the facilitation of fear during exposure, inhibitors of treatment response (e.g., distraction), and more recent theoretical discussions of the mechanisms of exposure therapy, such as Bouton's description of expectancy violation. As such, one or more of these components of presence may be more strongly associated with the experience of fear during VRE and treatment response than the overarching construct. The current study ($N=41$) evaluated relations between three theorized components of presence, fear ratings during VRE, and treatment response for VRE for social phobia. Results suggest that total presence and realness subscale scores were related to in-session peak fear ratings. However, only scores on the involvement subscale significantly predicted treatment response. Implications of these findings are discussed.

© 2011 Elsevier Ltd. All rights reserved.

1. Introduction

Virtual reality exposure therapy (VRE) is an effective treatment for a variety of anxiety disorders, including social phobia (for a review see Parsons & Rizzo, 2008). VRE involves exposing anxious individuals to virtually generated feared stimuli. An advantage of VRE relative to *in vivo* exposure therapies is the greater ease with which therapists can manipulate the feared stimuli within the virtual environment (Rothbaum, Hodges, Kooper, & Opdyke, 1995). This advantage is especially relevant to exposure treatment for social phobia, because *in vivo* treatment of social fears (e.g., fear of public speaking) requires recruitment of potentially large numbers of “audience members” on multiple occasions. Simulation of public speaking scenarios using virtual environments thus circumvents a significant barrier to treatment (Olfson et al., 2000).

A handful of studies have demonstrated the utility of VRE for reducing symptoms among those diagnosed with social phobia and those with high levels of public speaking fears. The largest study to date examined changes in social fears after 12 sessions of VRE in 18 participants with social phobia (Klinger et al., 2005). Exposures were conducted in four virtual environments; these environments replicated different social situations that revolved around performance (e.g., public speaking), interpersonal interaction (e.g., a dinner conversation), assertiveness (e.g., having a viewpoint challenged), and evaluation (e.g., completing a task while being observed). Those who received individual VRE demonstrated a comparable decrease in symptoms to those receiving cognitive behavioral group therapy. Two trials with smaller samples yielded similar findings. Anderson, Zimand, Hodges, and Rothbaum (2005) demonstrated that VRE reduced public speaking fears in 10 participants diagnosed with social phobia. VRE also was more effective than no treatment at reducing public speaking fears in a sample of undergraduates that rated public speaking as a highly feared situation (Harris, Kemmerling, & North, 2002).

The concept of presence has been identified as a mechanism by which exposure to virtual stimuli can successfully treat fears in the real world (Parsons & Rizzo, 2008; Regenbrecht, Schubert, &

* Corresponding author. Tel.: +1 404 413 6258.

E-mail addresses: Prima@muscd.edu (M. Price), Nmehta4@student.gsu.edu (N. Mehta), psyebm@langate.gsu.edu (E.B. Tone), Panderson@gsu.edu (P.L. Anderson).

Friedmann, 1998; Robillard, Bouchard, Fournier, & Renaud, 2003; Rothbaum et al., 1995; Wiederhold & Wiederhold, 2005). Presence is the extent to which an individual feels connected to or engaged with a virtual stimulus or environment (Lee, 2004; Schubert, Friedmann, & Regenbrecht, 2001). Empirical investigations and theoretical models both suggest that presence is comprised of multiple factors (Lee, 2004; Schubert et al., 2001; Witmer & Singer, 1998). The first factor, spatial presence, is the feeling that one is physically in the virtual space. Involvement, the second factor, is the extent to which one keeps attention focused on the virtual stimulus and ignores competing incongruent information. Realness, or the extent that the virtual stimulus coincides with expectations of the real stimulus, constitutes the third factor.

Despite the theorized relation between presence and VRE treatment response, there has been relatively little research on this topic, and results have been underwhelming. Specifically, two published empirical studies in this area found no significant relations between presence and response to VRE treatment for specific phobias (Krijn, Emmelkamp, Biemond, et al., 2004; Price & Anderson, 2007). Krijn, Emmelkamp, Biemond, et al. (2004) compared treatment response for acrophobia across high- and low-presence conditions. Researchers manipulated presence by using a complex computer-automated virtual environment (CAVE) which projects the virtual environment on the walls of a room for the high presence condition and a head mounted display (HMD) for the low presence condition. Results indicated that treatment response did not differ across high- and low-presence conditions. Price and Anderson (2007) reported similar findings in a sample of adults who received 8 sessions of VRE for fear of flying. Although presence was associated with peak fear ratings during the first virtual reality exposure therapy session, it did not predict treatment response.

These null findings as to the relation between presence and treatment response challenge a basic assumption of VRE – that presence is a mechanism by which exposure therapy works. From the beginning, VRE researchers linked the concept of presence to the emotion processing theory (Foa & Kozak, 1986), which posits that a phobic fear structure must be activated through presentation of a feared stimulus in order for effective exposure therapy to occur. Presence was conceptualized as the construct that enabled fear to be experienced towards a virtual stimulus; it thus constituted a necessary condition for effective exposure therapy as detailed by emotional processing theory (Anderson, Rothbaum, & Hodges, 2000). Indeed, the first VRE treatment outcome studies specifically targeted fears with powerful physical cues (e.g., height) that could be easily modeled within a virtual environment in order to maximize presence and fear structure activation (Rothbaum et al., 1995).

However, according to emotional processing theory, activation of the fear structure alone does not guarantee effective exposure therapy (Foa & Kozak, 1986). According to the emotion processing theory, effective exposure therapy requires prolonged, repeated, and controlled exposure to feared stimuli for extinction of fear to occur. Although VRE is described as an ideal mechanism for exposure therapy because it can be more easily manipulated (e.g., prolonged, repeated, and controlled) than *in vivo* exposure, it is still a context that provides only the *potential* for extinction learning. As a result, presence has been described as a construct that is necessary, but not sufficient for obtaining treatment response (Price & Anderson, 2007).

Examining the distinct factors that compose the construct of “presence” may help clarify both its potential relation to VRE treatment response and the null findings to date obtained with global presence measures. For example, the involvement factor reflects attention to the virtual stimulus, and relates to research showing that distraction from feared stimuli inhibits treatment response (Grayson, Foa, & Steketee, 1982; Wells & Papageorgiou, 1998).

Presumably, greater involvement with the virtual environment is associated with greater attention to the feared stimulus, thus enhancing the effectiveness of the virtual environment as a context for extinction learning.

The realness factor of presence (the extent to which the virtual stimulus coincides with expectations about the real world stimulus), maps on to the face valid concept of how “real” the virtual environment feels, and may be important for fear structure activation. It also pertains to Bouton’s (2004) notion of the importance of expectancy violation in extinction learning. According to Bouton, exposure therapy provides the opportunity for disconfirmation of expectations about feared stimuli (e.g., when a college student with social phobia signs up for a class that includes an oral presentation and finds that she neither fails the assignment nor is humiliated, and the experience disconfirms her negative expectations). In the context of VRE, the notion of expectancy violation is particularly interesting. There are likely some expectancies that cannot be violated in the virtual environment (e.g., there is no chance that the student will fail a course based on poor performance on a speech in a virtual environment) and other expectancies that could be violated (e.g., the person does not sound “stupid” while speaking to a group).

Finally, the spatial presence factor of presence (the extent that the participant feels they are physically in the virtual environment) has been associated with increased physiological arousal after completing goals in an interactive virtual environment (Niklas et al., 2004). For those with social phobia, interacting with a virtual audience should lead to increased arousal and anxiety.

Of the two prior studies that examined the relation between presence and treatment response, one study (Price & Anderson, 2007) assessed presence using a unidimensional measure, and thus did not assess the roles of distinct aspects of the construct. Krijn, Emmelkamp, Biemond, et al. (2004) did not assess presence directly, but instead manipulated it by assigning participants to low and high-presence conditions. Notably, a moderate proportion of participants dropped out or withdrew ($n = 10$) from the low presence condition because it did not arouse anxiety. Thus, there are theoretical reasons to evaluate the relation between presence, particularly the factors of presence, and treatment response that have not been adequately examined in the two studies examining the topic to date.

The current study sought to examine associations between presence, the global construct as well as its constituent factors (spatial presence, involvement, realness), fear ratings during VRE for public speaking fears, and treatment response among a clinical sample diagnosed with social phobia. We hypothesized that the overall score on a self-report measure of presence, as well as scores on each of the 3 factor subscales would be positively associated with both fear ratings during VRE sessions and treatment response. A second aim of the study was to replicate prior research showing that the global construct of presence is related to fear ratings during VRE, and to extend this research by examining how specific presence factors relate to fear during VRE.

2. Methods

2.1. Participants

Participants were 41 individuals diagnosed with social phobia according to DSM-IV criteria who were recruited as part of two larger treatment outcome studies. Diagnoses were made using the Structured Clinical Interview for the DSM-IV (SCID; First, Gibbon, Spitzer, & Williams, 2002) by doctoral students that were trained in diagnostic interviewing via training tapes and practice interviews under the supervision of a licensed clinical psychologist.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات