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THE EXPERIENCE OF EXPOSURE ACROSS RACIAL GROUPS: DIFFERENCES IN PRESENCE DURING VIRTUAL REALITY EXPOSURE THERAPY FOR SOCIAL PHOBIA
ACROSS AFRICAN-AMERICAN AND CAUCASIAN WOMEN

by

NATASHA MEHTA

Under the Direction of Page Anderson and Kelly Lewis

ABSTRACT

Few studies have looked at the experience of exposure therapy (ET) amongst underrepresented populations. African-American (AA) women may be at higher risk for anxiety and experience treatment differently than their Caucasian counterparts. Virtual reality exposure therapy (VRE) is suited to examine differences in treatment experiences because a measure of “presence” exists to quantify the experience of standardized VRE. Qualitative methods provide an opportunity to explore the experience of underrepresented populations and individual differences. The current study employed a mixed-method design to compare self-reported levels of presence during VRE across a sample of 24 AA and Caucasian women diagnosed with social phobia. The study also examined how AA women discussed their experiences of VRE (N=4). Results revealed that AA women reported greater presence than their Caucasian counterparts. Qualitative results highlighted benefits and areas of improvement in the experience of exposure therapy. These findings have important implications for differential experiences of treatment.

INDEX WORDS: Exposure therapy, Virtual Reality Exposure, Experience of treatment, African-American, Women

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NATASHA MEHTA

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Master of Arts
in the College of Arts and Sciences
Georgia State University
2013

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2013

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1. INTRODUCTION

1.1 Overview of Social Anxiety Disorder

Social Anxiety Disorder (SAD) is a pervasive psychological disorder characterized by persistent fear and avoidance of social or performance situations involving possible negative evaluations by others (APA, 2000). The most commonly feared situation is public speaking (Furmark, Tillfors, Stattin, Ekselius, & Fredrikson, 2000). The generalized subtype of SAD is characterized by symptoms of intense and pervasive fears across situations including, but not limited to, initiating conversations, speaking with authorities, being assertive, and attending social events. Lifetime prevalence rates range from 10-13% in the general population, making SAD the fourth most prevalent psychological disorder (Magee, Eaton, Wittchen, McGonagle, & Kessler, 1996), and the second most common anxiety disorder (behind specific phobia) in the United States (Kessler et al., 2005). Functional impairment associated with this disorder includes lower levels of educational achievement and less income. Individuals with SAD also are less likely to be married (Turner & Beidel, 1988). Social anxiety disorder has a low rate of treatment compared to other major disorders. Studies indicate that between 72% and 95% of individuals who receive a diagnosis report never having received mental health treatment (Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992). Socially phobic individuals participating in National Anxiety Disorders Screening Day indicated that the most common barriers to treatment were uncertainty over where to go for treatment, financial barriers, and fear of what others might think (Olfson et al., 2000).

1.2 Exposure Therapy is Effective for Social Anxiety Disorder

Exposure therapy is well established as an effective treatment for social anxiety (Butler, 1984). Exposure therapy is based on modern principles of behavioral extinction learning in which individuals learn that a feared outcome will not occur, thus reducing the fear and avoidance associated with the feared object and/or situation (Kroenke, Spitzer, Williams, Monahan, &

Löwe, 2007). During exposure therapy, extinction occurs through repeated and systematic confrontation with the feared stimuli under conditions in which the feared outcome does not occur. Exposure therapy for social anxiety procedurally involves repeated exposure to a feared social situation (i.e., a public speaking task) in the absence of any danger (i.e., a negative evaluation) (Hofmann, 2007). Recent evidence indicates that the process of behavioral extinction does not involve “unlearning” a previously fear association, but rather entails a new learning process in which individuals come to associate an alternate non-threatening or neutral outcome with the previously feared stimuli (Rescorla, 2001).

There are both cognitive and biological processes that have been identified as possible mechanisms of extinction learning to explain why exposure results in fear reduction. According to emotional processing theory (Foa & Kozak, 1986; Foa & McNally, 1996), as physiological fear decreases during repeated and prolonged exposure to feared stimuli, new interoceptive information is encoded (i.e., the absence of arousal in the presence of the feared stimuli), which is inconsistent with the original fear structure. In addition, contrasting new information about the meaning of the stimuli is encoded (i.e., feared outcomes do not occur or are not as distressing as expected). The integration of these two types of information – information that is incompatible with existing representations of threat – during the course of exposure therapy results in long-term fear reduction.

Biological perspectives of extinction implicate the amygdala, the medial prefrontal cortex, and glutamatergic NMDA receptors in processes of extinction learning (Quirk, Armony, & LeDoux, 1997; Sotres-Bayon, Bush, & LeDoux, 2004). During the process of extinction, the medial prefrontal cortex and amygdala play a crucial role in the expression of conditioned fear by inhibiting the retrieval of previously learned associations (Sotres-Bayon et al., 2004). Furthermore, activation of NMDA receptors facilitates the process of associative learning, and is therefore essential for fear extinction. Neural changes occurring during the course of exposure therapy translate to long-term fear reduction (Hofmann, 2007).

Exposure therapy is effective for SAD both as a stand-alone treatment (Biran, Augusto, & Wilson, 1981; Wlazlo, Schroeder-Hartwig, Hand, Kaiser, & Münchau, 1990), as well as a component of cognitive behavioral therapy (CBT), which combines exposure with other components, including psychoeducation and cognitive restructuring (for reviews, see Hofmann & Smits, 2008; Taylor, 1996). However, there is some debate as to whether cognitive therapy provides additional benefit beyond exposure therapy for SAD. Meta-analyses comparing the effects of CBT versus exposure therapy (Feske & Chambless, 1995) and exposure therapy versus exposure plus cognitive restructuring (Rodebaugh, Holaway, & Heimberg, 2004) indicate that both treatment modalities are equally effective. A more recent meta-analysis comparing exposure alone and exposure plus cognitive restructuring also reported no significant differences between the effects of the two treatments (Nortje, Posthumus, & Moller, 2008). An effect size analysis, however, suggested that exposure alone may be better for reducing avoidance of social situations and general interference, while exposure plus cognitive restructuring may be better for reducing subjectively experienced anxiety (i.e., distress) in social situations. In summary, this evidence suggests that exposure is a crucial and necessary element in effective treatment.

Despite the large body of literature identifying the importance of exposure in the reduction of social anxiety, few studies have looked at the experience of exposure therapy amongst varying populations. In particular, differences in the experience of exposure therapy in underrepresented populations have yet to be examined, including those who self-identify as African American.

1.3 Virtual Reality Exposure Therapy

Virtual reality exposure therapy (VRE) offers one avenue for examining engagement with exposure therapy. Virtual reality is a medium for conducting exposure therapy in which a person faces a phobic fear within a computer-generated virtual environment. The most common ap-

proach to virtual reality exposure is to outfit the user in a head-mounted display, which presents a computer-generated view of a virtual world that changes in a natural way with head and body motion. Empirical research shows that VRE is effective for treating anxiety disorders (Powers & Emmelkamp, 2008), and the small literature examining VRE for social anxiety suggests that it is an effective medium for exposure therapy (Anderson, Zimand, Schmertz, & Ferrer, 2007; Anderson, Zimand, Hodges, & Rothbaum, 2005; Klinger et al., 2005). In a clinical trial of 10 patients diagnosed with social phobia or panic disorder with agoraphobia with a predominant fear of public speaking, Anderson and colleagues (2007) provided participants with 4 sessions of virtual reality exposure as part of an 8-week clinician-administered manualized treatment that also included breathing retraining and cognitive restructuring. During VRE, participants gave a speech in a computer-generated virtual environment that consisted of either 5 people around a conference table or 22 people in an auditorium, using a head-mounted display. The audience consisted of high-resolution digital video of actual people embedded within the virtual environment. During exposure therapy, the therapist controlled the audience's reactions (i.e., bored, applause) and could communicate with the patient via a microphone. Results of the study showed statistically significant decreases on measures of public-speaking anxiety after treatment as well as at a 3-month follow up. Effect sizes were large at both time points ($d = .8-1.5$).

Theoretical models suggest that in order to treat anxiety disorders, the phobic fear structure must be activated (Foa & Kozak, 1986; Lang, Bradley, & Cuthbert, 1997). Traditionally, the fear structure has been activated via an actual encounter with a feared stimulus (in vivo exposure) or through the imagination (imaginal exposure). The theorized construct by which the fear structure is activated within VRE is presence; a key theoretical concept for explaining how virtual reality exposure can treat real-world fears (Robillard, Bouchard, Fournier, & Renaud, 2003; Rothbaum et al., 1995). 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). Presence is an essential construct for explaining how people benefit from virtual reality

exposure, as it is theorized to be the means by which people experience anxiety while encountering the virtual stimulus (Anderson, Jacobs, & Rothbaum, 2004). The empirical research suggests that presence is positively related to self-reported levels of anxiety while in a virtual environment among both non-clinical and clinical samples (Price & Anderson, 2007; Price, Mehta, Tone, & Anderson, 2011; Regenbrecht, Schubert, & Friedmann, 1998; Robillard et al., 2003).

Presence is comprised of three elements: spatial presence, involvement, and realness (Schubert et al., 2001). Spatial presence is the feeling that one is physically in the virtual space. Involvement is the extent to which one remains focused on the virtual environment and ignores extraneous distractions. Realness is the extent that the virtual stimulus is consistent with expectations of the real stimulus. Spatial presence, specifically, has been associated with increased physiological arousal after engaging in an interactive virtual environment (Ravaja et al., 2004). In addition, a recent study found that higher levels of presence, and in particular the involvement subscale, were associated with a better treatment response to VRE for social phobia (Price et al., 2011).

In sum, the concept of presence is important theoretically, in that it is presumed to be the mechanism by which virtual environments activate the phobic fear structure, a necessary condition for exposure therapy. Furthermore, the empirical literature to date shows that it is associated with self-report levels of anxiety during VRE and that it predicts treatment response to VRE for social phobia. As such, presence offers one way to begin to explore engagement with exposure therapy across and within racial and gender groups.

1.4 Potential Discrepancies Between Racial Groups in Treatment

Almost nothing is known about the experience of exposure therapy among underrepresented populations, including African Americans (Whaley & Davis, 2007). One reason is that African Americans are less likely to seek treatment (Reiger et al., 1984), and so clinicians using exposure therapy do not have the opportunity to observe whether there are group differences in

the experience of exposure, or they may have not recognized the need to examine differences due to the smaller number of these individuals in treatment. Many contributing factors have been identified for treatment underutilization, including past misuse in research and general mistrust of health professionals (Office of the Surgeon General (OSG), n.d.). Similarly, African Americans have reported histories of adverse experiences with health professionals, such as rating physician visits as “less participatory” than Caucasian patients (Cooper et al., 2003). This research suggests that the experience of treatment, including CBT, may be different for African Americans. Past misuse by and mistrust of mental health professionals may be especially relevant for exposure therapy, as it involves directly confronting a feared situation, sometimes in very intense ways. In addition, given that CBT, including exposure, uses a collaborative treatment process, therapist bias or patient mistrust may interfere with collaboration and thus impact the experience of exposure. Finally, when they do receive treatment, African Americans tend to drop out more frequently and average fewer sessions than their non-minority counterparts (Organista, Muñoz, & González, 1994; Sue, Fujino, Hu, Takeuchi, & Zane, 1991), which further suggests a unique experience of therapy amongst this population. Indeed, there is no study that has examined the experience of exposure therapy among an African American sample or attempted to understand their experience in their voice.

1.5 The Effect of a Double-Minority Status: African-American Women and Anxiety

Minority theorists have suggested that African-American women may be at higher risk for anxiety than their Caucasian counterparts because of a double-minority status of gender and race (Comas-Diaz & Greene, 1994; Neal-Barnett & Crowther, 2000). Women of color experience twice the number of opportunities for isolation or discrimination, based on race and/or gender, thus lowering their level of social acceptability (Comas-Diaz & Greene, 1994). Relat-

edly, clinical theorists have developed a construct called the Strong Black Women (SBW)¹ that represents an idealistic icon that many Black women strive to attain and are expected to uphold (Romero, 2000; Thompson, 2004). The SBW is characterized as strong, independent, nurturing, and able to successfully handle intolerable life circumstance. Thus, this idealistic icon of strength suggests that the SBW is not allowed to fail or show weakness, is detached from her own emotions, and is reluctant to seek help for her own needs (Romero, 2000; Thompson, 2004). Over time, this ideal has developed into a culturally accepted coping strategy to help Black women deal with the stresses of racism and sexism in America, and provides an example of a cultural norm that could help us understand the current mental health disparities of African-American women, and perhaps explain some of the gaps in the mental health treatment of African-American women (Green, 2012). Indeed, previous research on the SBW cultural construct scale suggests that SBW attitudes predict stress in African-American women (Hamin, 2010).

Unfortunately, the research testing the double-minority risk theory is scarce. This is in part because traditional research on African-American women has been subsumed under gender studies or race studies (Mays, 1988). In general, reported lifetime prevalence rates of SAD are higher for women than men (Xu et al., 2012). Furthermore, although lifetime prevalence rates for African Americans are lower relative to European Americans (Breslau, Kendler, Su, Gaxiola-Aguilar, & Kessler, 2005), Hunter and Schmidt (2010) suggest that the rates of SAD, as well as other anxiety disorders, are erroneously low because of sociocultural influences. They posit that beliefs or attitudes related to awareness of racism, stigma of mental illness, and salience of physical illness lead to a differential presentation of anxiety that may get overlooked or underreported (Hunter & Schmidt, 2010). Other than case studies, published reports of African-American women with social phobia appear to be nonexistent (Hunter & Schmidt, 2010; Neal-

¹ For the purposes of this manuscript African American and Black are synonymous, however, both terms are used to remain consistent with the literature reviewed.

Barnett & Crowther, 2000). Therefore, research on this population is necessary in order to better conceptualize cases and improve treatment effectiveness in this population.

A few studies indicate that cognitive behavioral therapy for anxiety is effective with African-American women (Chambless & Williams, 1995), although the experience of treatment can be different for this population compared to both White women and African-American men (Breslau et al., 2005). For example, in a study of 75 African-American and White adults (majority female; 87%), Chambless and Williams (1995) found that after treatment, low-income African-American agoraphobics reported more symptoms than their White counterparts, suggesting different treatment effects. Therefore, further research is needed to continue examination of the hypothesis that African-American women, given their unique cultural norms and expectations, may experience treatment for social anxiety differently than their Caucasian counterparts.

1.6 Benefits of Qualitative Research Methods with Diverse Populations

There is a growing body of literature that advocates for the use of qualitative research methods with diverse populations (Chambless & Williams, 1995). Qualitative research, such as in-depth interviews with individual participants, provides a medium for exploring the unique experiences of an underrepresented culture or population, such as African-Americans, and the subjective meanings that contribute to specific behaviors (Banyard & Miller, 1998; Bergold, 2000). Qualitative research is a purposeful value-based method of inquiry that gives voice to populations, such as people of color, which have not been given appropriate attention in quantitative research, particularly in treatment outcome studies (Hoshmand, 1999; Morrow, 2007). As such, qualitative methods allow for descriptive and discovery research that facilitates asset and problem identification (i.e. deficit frameworks, differences in treatment experiences) and is sensitive to the context and diversity of populations involved (Bergold, 2000; Hoshmand, 1999). The descriptive nature of context expressed in qualitative interviews allows researchers to explore individual differences between groups, by capturing the diverse experience of different

populations (Banyard & Miller, 1998). In addition, because qualitative methods allow for the in-depth examination of processes, they are particularly suited for understanding therapy processes, such as exposure (Hill et al., 2005). Thus, these methods can enhance the development of culturally sensitive and relevant types of intervention that incorporate the perspectives of prospective participants (Maton, 1993; Silverstein & Auerbach, 2009).

1.7 Justification of the Present Study and Hypotheses

The current study is a mixed-method design that employs both a quantitative and qualitative component. The purpose of the current study is to examine engagement in virtual reality exposure therapy for participants who self-identify as “African American” or “Caucasian” and female. First, we will conduct an exploratory *quantitative* analysis of differences in presence scores between African-American and Caucasian female participants. In addition, we will employ an exploratory *qualitative* analysis to identify factors related to presence for African-American participants. Specifically, we are interested in participants’ discussion of their experiences during VRE and the overall exposure therapy process. Given the exploratory nature of this analysis, we did not make any directional hypotheses.

This mixed method study aims to answer the following research questions:

1. Are there differences in engagement in virtual reality exposure as measured by self-reported levels of presence during VRE for SAD between Caucasian and African-American women?
2. How do African-American women talk about their experience of exposure therapy?

2. METHODS

2.1 Participants (Quantitative)

Participants were 15 Caucasian and 9 African-American women diagnosed with social anxiety disorder who were recruited as part of two larger treatment studies. The first study was a randomized-controlled trial (N=75), which compared cognitive behavioral group therapy to VRE to a Wait-list (WL) control for social phobia. The second study was an open trial (N=10) examining neural correlate predictors of response to treatment for VRE for social phobia using functional magnetic resonance imaging (fMRI). For the purposes of the current study, only women who self-identified as either Caucasian or African American were included. Diagnoses were made using the Structured Clinical Interview for the DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 2002) by trained research assistants. The majority of participants did not meet criteria for any comorbid diagnoses ($n = 17, 71\%$). To be included in the treatment studies, participants had to be English speakers and meet DSM-IV criteria for social phobia. Participants taking psychoactive medication had to have been stabilized on their current medication(s) and dosage(s) for at least 3 months and were also required to remain at the same dosage throughout the study. Individuals meeting any of the following criteria were excluded, (a) history of mania, schizophrenia, or other psychoses; (b) current suicidal ideation; (c) current alcohol or substance dependence; (d) inability to tolerate the virtual reality helmet; (e) history of seizures. Ad-

ditional exclusion criteria for the second study, which used functional magnetic resonance imaging (fMRI), included (a) presence of metal in the body; (b) currently pregnant; (c) claustrophobia.

Age ranged from 21-60, with an average age of 39.96 years ($SD = 10.89$). The majority of the sample was married ($n = 15, 63\%$), and had completed college ($n = 17, 71\%$).

2.2 Measures (Quantitative)

The following measures were used to assess social phobia and presence.

Igroup Presence Questionnaire (Schubert et al., 2001): The IPQ is a 14-item self-report questionnaire designed to assess presence. Items are scored on a 7-point Likert scale (1-7) with scores ranging from 7 to 98, and higher scores indicating a greater sense of presence. The IPQ has three subscales: spatial presence, involvement, and realness. The spatial presence subscale contains five items assessing feelings that one is physically within a virtual environment (e.g., "I had a sense of acting in the virtual space, rather than operating something from outside."). The involvement subscale contains four items assessing attention to the virtual world (e.g., "I was completely captivated by the virtual world."). The realness subscale contains four items assessing how real the virtual stimuli appear (e.g., "How real did the virtual world seem to you?"). The measure has good psychometric properties and a factor structure that has been replicated across multiple samples (Schubert et al., 2001). In the current study, the measure showed good reliability with Cronbach's alphas ranging from .71 to .83 for total IPQ scores across sessions.

Structured Clinical Interview for the DSM-IV (SCID; First et al., 2002): The SCID is a structured, well-validated diagnostic clinical interview used to assess psychological disorders based upon DSM-IV criteria. For the current project, the SCID was used to establish the inclusion criteria of a diagnosis of social phobia, as well as presence of a variety of Axis I conditions within the mood, alcohol/substance use, and anxiety disorders modules. A randomly selected

subset of videotaped SCIDS were viewed by a licensed psychologist to provide independent ratings for Trial 1 (10%, n=8) and Trial 2 (25%, n=6). There was 100% agreement on the presence of the primary diagnosis and one disagreement on illness severity.

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ratings for Trial 1 (10%, n=8) and Trial 2 (25%, n=6). There was 100% agreement on the presence of the primary diagnosis and one disagreement on illness severity.

2.3 Procedure (Quantitative)

Data from two treatment trials (described above) were used for the present study. Participants were recruited through newspaper advertisements, posted flyers, and internet-based outlets seeking participants with significant fears of public speaking. All data from female participants who completed VRE and self identified as either “Caucasian” or “African American” were used (trial 1, n=19; trial 2, n=5). For the purposes of the present study, the procedures are the same across the two trials, with the exception that participants in the fMRI trial were not randomly assigned to treatment. Figures 1 and 2 show the flow of participants through trial 1 and trial 2, and were prepared in accordance with guidelines outlined in the CONSORT (Consolidated Standards of Reporting Trials; Altman et al., 2001) and TREND (Transparent Reporting of Evaluations with Nonrandomized Designs; Des Jarlais, Lyles, & Crepaz, 2004) statements. The attrition rates did not differ between ethnic groups for Trial 1, 13% and 17%, or for Trial 2, 71% and 63% for African Americans and Caucasians, respectively.

Setting and Personnel. All procedures for this study were conducted at the Psychology Clinic at Georgia State University and were approved by the University’s Institutional Review Board. Four doctoral candidates in clinical psychology conducted all assessment procedures, including telephone screening and in-person assessments. Doctoral students were trained in diagnostic interviewing via training tapes and practice interviews, which were reviewed by a licensed clinical psychologist. Treatment was administered by five study therapists. Two were licensed psychologists with prior experience implementing manualized cognitive behavioral therapy and three were clinical psychology doctoral students. Prior to administering therapy, study therapists attended a two-day intense training workshop, led by the developer of the treatment. Junior therapists were supervised by the last author.

Assessments. Eligibility was determined through a two-part process involving a brief telephone screening and an in-person, pre-treatment assessment. During the phone screen, potential participants were asked questions to rule out obvious exclusion criteria (e.g., began psychoactive medication within the past 3 months). Following the phone screen, interested and eligible individuals were scheduled for the face-to-face pre-treatment assessment, which included administration of the SCID. The IPQ was administered at the end of each exposure session (sessions 5-8).

Treatment. VRE consisted of eight sessions of individual therapy delivered according to a treatment manual (Anderson et al., 2005). The treatment was designed to target several processes shown to maintain social anxiety, including self-focused attention, negative perceptions of self and others, per

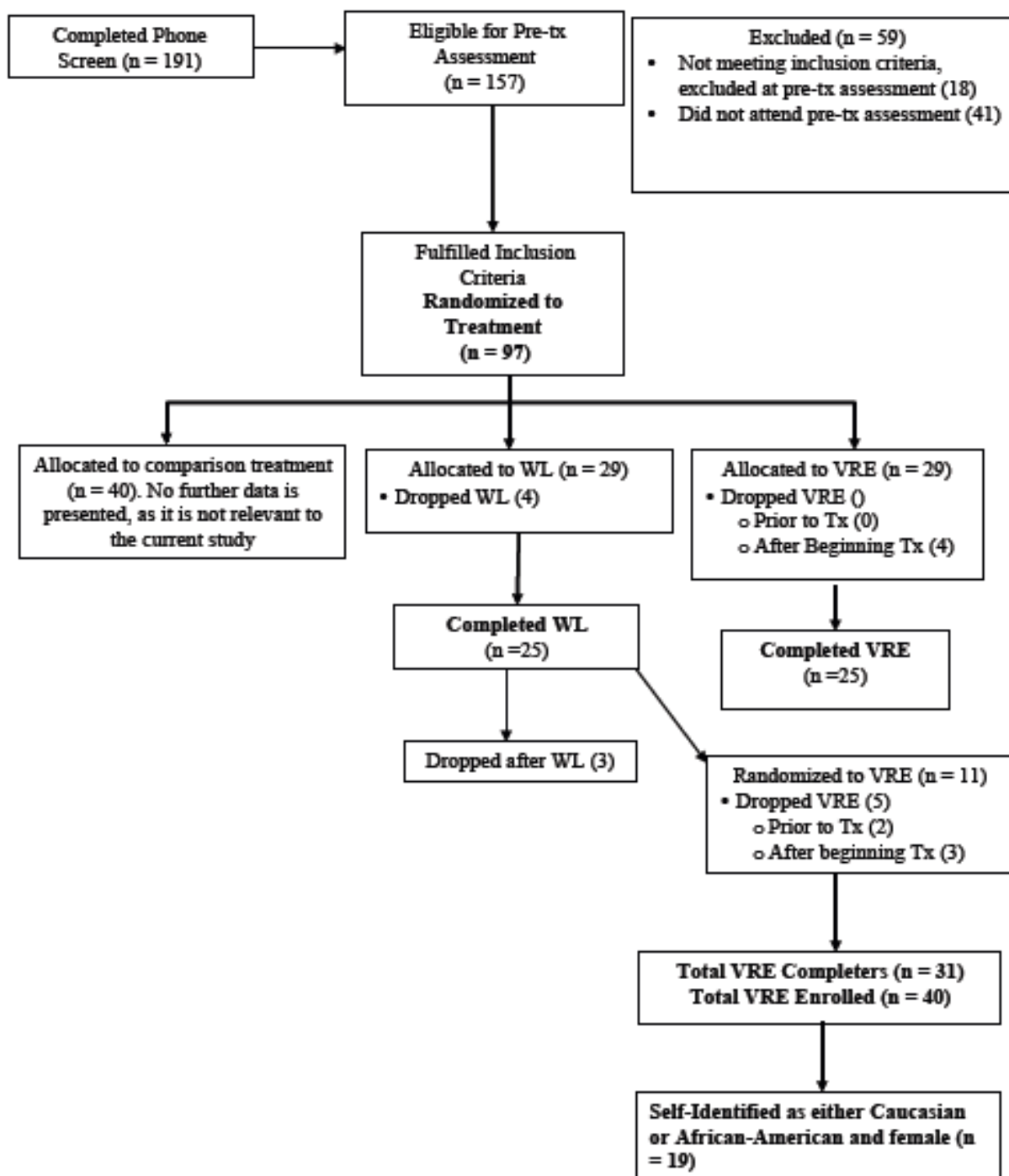


Figure 1. Flow of participants through Study 1.

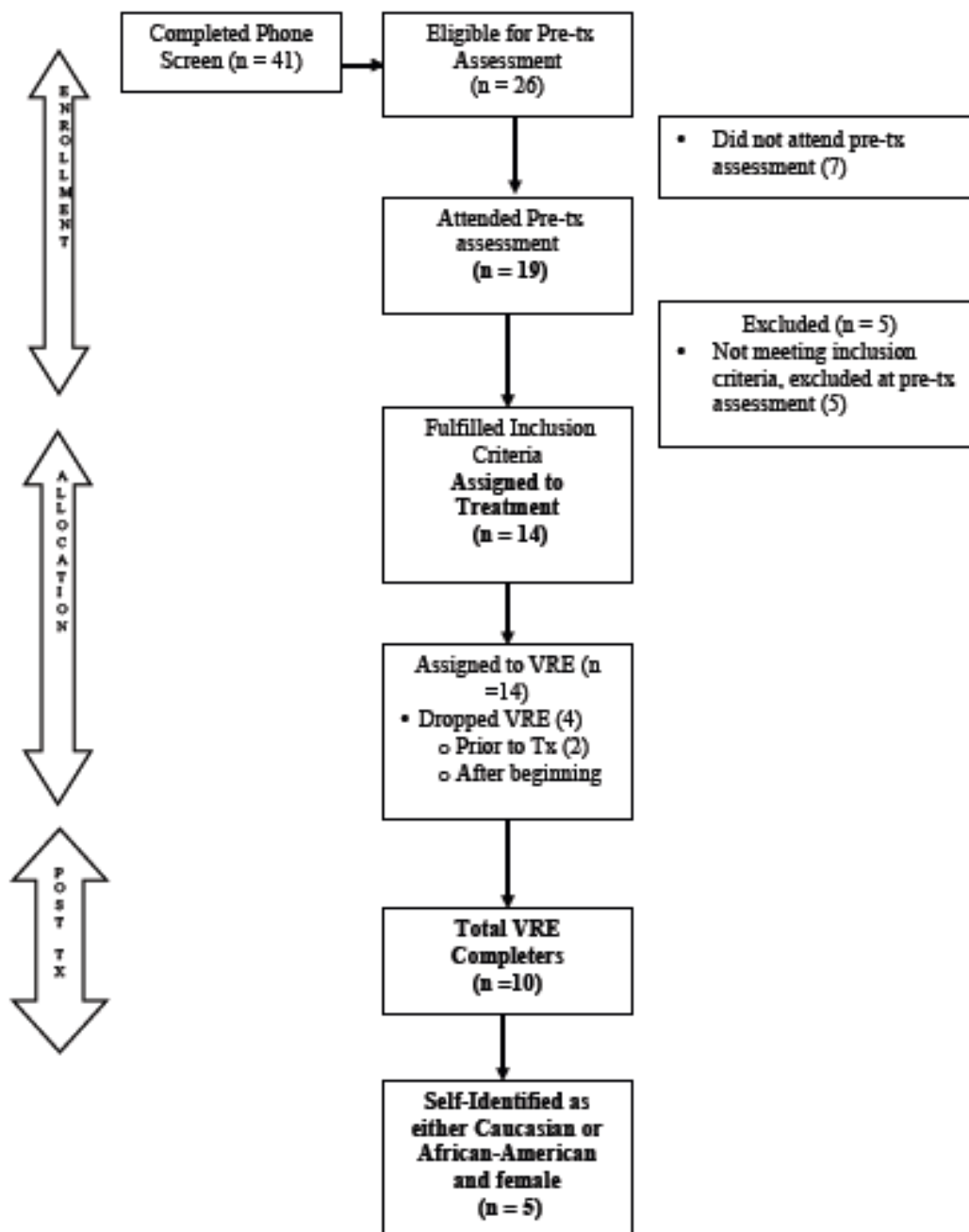


Figure 2. Flow of participants through Study 2, fMRI clinical trial.

ceptions of lack of emotional control, rumination, and realistic goal setting for social situations. The first four sessions targeted these processes via use of cognitive restructuring and videotape feedback exercises. Sessions 5-8 consisted of exposure to various virtual environments. These scenarios were presented via a head-mounted display (HMD) that consisted of a helmet with headphones, goggles, and a tracker that allowed the virtual environment to move naturally with the participant. The virtual reality (VR) scenarios included 1) a conference room (approximately 5 audience members), 2) a classroom (approximately 35 audience members), and 3) a large auditorium (approximately 100 audience members). VRE therapists could manipulate audience reactions (e.g., making them appear interested/bored, supportive/hostile, distracted), as well the difficulty of questions posed by audience members, according to each client's treatment goals. For Trial 1, independent ratings of adherence and competence in delivering the treatment was provided by a developer of the treatment for a randomly selected subset of videotaped sessions (14%) using a measure identifying essential elements for each session as well as protocol violations. Adherence was indicated by the proportion of essential elements completed by the therapist, and competence in delivering each element was rated using a 7 point scale (1- very poor to 7-excellent). Across these sessions, therapists completed 92% of the essential elements with a mean quality rating of 6.1. One protocol violation was identified.

2.4 Participants (Qualitative)

Participants were 4 African-American women that participated in the previous randomized-controlled treatment study (Trial 1, described above), as well as a follow-up study. Qualitative data was collected as a part of the follow-up study. To be included in the follow-up study, participants a) self-identified as African American and b) were eligible for the previous treatment study.

2.5 Measures (Qualitative)

Culturally Relevant Interventions for Social Phobia Interview (CRISP): This semi-structured interview was developed by the researchers specifically in order to explore African-American participants' experiences with social anxiety, the therapy process and research processes, and to gather feedback about the utility of a culturally adapted treatment for SAD. Interview sections and questions focused on racial identity and anxiety (e.g., Do you think your experiences as an African American impact your public speaking anxiety?), as well as participation in the study (e.g., What was the research process like for you? What was the therapy process like for you?).

2.6 Procedure (Qualitative)

The study was created as a follow-up project to the larger treatment study in order to further explore participants' experiences with social anxiety and their participation in the treatment study. All participants ($N = 34$) who self-identified as African American and were eligible to participate in the first treatment study, including participants who had withdrawn prior to study to completion, were mailed pamphlets inviting their participation in a follow-up interview. Background rationale and study procedure information was provided in the pamphlet, as well as a number to call for further information. A total of 12 participants contacted the lab and were screened for participation; 9 completed the study. Assessments took place at GSU; participants first completed a packet of questionnaires and then the interview. Trained researchers adhering to the semi-structured interview script conducted interviews with participants either in person or via telephone. The participants were given the opportunity to request a male or female, African-American or non African-American interviewer. Interview length ranged from 70 to 150 minutes and participants received \$50 for their participation. Of the 9 participants, 4 women had received VRE treatment, which comprises the current study's sample.

2.7 Data Analysis

Quantitative. A series of t-tests were conducted to examine group differences across African-American and Caucasian women on the total scale of the IPQ and the spatial presence, involvement, and realness subscales.

Qualitative. Interviews from the culturally relevant study were transcribed and analyzed for content to identify emerging themes of factors that participants' described influence their experience of exposure therapy. A thematic analysis was conducted following three procedures that are established iterative techniques for aggregation and synthesis of qualitative data (Morgan, 1998). First, the transcripts were repeatedly read to search for meanings and patterns in the data that highlight experiences of exposure therapy. This thematic analysis approach was based on grounded theory, which aims to systematically develop a theory derived directly from the data, rather than seeking out data to verify a pre-conceived theory (Strauss & Corbin, 1998). Second, open coding procedures were employed, noting and extracting factors or categories that could influence exposure therapy (Strauss & Corbin, 1998). In qualitative research, coding provides a way of exploring information in the data, looking for similarities and differences. Related concepts were then clustered to identify latent constructs using a comparative approach. This method is an iterative process that organizes data in a way that allows for constructing themes, descriptions, and theories. Finally, an independent coder examined concept clusters and identified a label that depicts the common theme. This was to enhance objective analyses and ensure coder credibility. Independent coding comparison analyses revealed a 98% agreement; remaining discrepancies were resolved through discussion.

Power Analysis. For the quantitative analysis, an a priori power analysis (G*Power, Germany) indicated that in order to detect a medium effect ($d = 0.5$) with a power of .8 and a significance level of 0.05, a sample size of $n = 21$ would be needed, suggesting that the current study had an adequate sample size ($n = 24$) to detect a medium effect or larger.

3. RESULTS

3.1 Quantitative

A series of t-tests were conducted to examine differences between African-American and Caucasian participants' scores on the total scale of the IPQ and the spatial presence, involvement, and realness subscales (Table 1). Scores were calculated by averaging individual scores across all four exposure sessions. African Americans reported significantly higher scores on the IPQ total scale, $t(22) = -2.66, p < 0.05, \text{Cohen's } d = 1.11$. African Americans also reported significantly higher scores on the realness subscale, $t(22) = -3.05, p < 0.01, \text{Cohen's } d = 1.24$. Differences on the involvement subscale approached significance and had a comparable effect size to that observed for realness, $t(22) = -1.84, p = 0.08, \text{Cohen's } d = 0.81$. Finally, there were no significant group differences on the spatial presence subscale, $t(32) = -0.18, p = 0.86, \text{Cohen's } d = 0.07$.

Additionally, although the sample size may limit the power to conduct regression analyses, multiple linear regressions were conducted to examine the potential effect of pre-treatment anxiety levels on reported levels of presence. Thus, pre-treatment anxiety score on the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987) was entered as a covariate in the models. Results were consistent with t-test analyses, with ethnic group significantly predicting total IPQ scale scores ($B = 10.292, p < .05$) and the realness subscale scores ($B = 3.622, p < .05$), controlling for pre-treatment anxiety.

3.2 Qualitative

Interviews from the culturally relevant study were transcribed and analyzed for content related to how African-American women talk about their experience of exposure. Two meta-themes emerged related to participants' experience of exposure therapy: (1) benefits of the exposure therapy (2) areas for improvement of exposure therapy. Within these meta-themes, individual thematic factors were identified, which are discussed below.

Table 1: Descriptive Statistics and Ethnic Differences in Presence

Note: * = $p < .05$, ** = $p < .01$. + = $p < 0.08$. IPQ = Igroup Presence. IPQ scores represent an average score across all four exposure sessions.

	<u>African-American</u>	<u>Caucasian</u>		Effect Size
	<i>M</i> (SD)	<i>M</i> (SD)	<i>t</i> (1, 32)	(d)
IPQ	63.87 (8.82)	54.24 (8.47)	-2.66*	1.11
Spatial Presence	20.67 (2.28)	20.52 (1.68)	-0.18	.07
Involvement	19.01 (3.19)	15.93 (4.34)	-1.84 ⁺	.81
Realness	18.43 (4.50)	13.46 (3.45)	-3.05**	1.24

Under the meta-theme of the benefits of exposure therapy, two themes emerged: (1a) the therapeutic alliance and (1b) the therapist's race. Within areas for improvement of exposure therapy, participants identified (2a) wanting longer treatment or more exposures, (2b) wanting real-audience exposures in addition to virtual reality exposure and (2c) wanting evaluative feedback. (Figure 3).

1a. Benefits: The Therapeutic Alliance. According to participants, a benefit of their experience of exposure therapy was a positive therapeutic alliance. In fact, having a therapist that clearly and supportively guided participants through treatment was identified by three participants (75%). For instance, Mary² (age 54), noted that her therapist was particularly insightful – *“She was very kind, very attentive, and asked thought-provoking questions...she was very supportive and helped me see things that I had never really thought about,”* Mary said. Another participant, Tanya (age 37), indicated that her therapist was particularly good at preparing her and clearly outlining the process so that she felt comfortable and informed about the things she was asked to do (e.g., use the virtual reality equipment, being videotaped). *“I was coached along the whole process. Early on we established the things that I was most comfortable with and the things that I was not comfortable with, and she made it a point to keep me prepped along the way what to expect from week to week,”* Tanya stated.

1b. Benefits: Therapists' Race and Ethnicity. Another identified benefit of the experience of therapy was whether the therapist was of the same racial or ethnic background as the participant (2 participants; 50%). Mary (age 54) noted her therapist's ethnic identity as a positive factor in her experience – *“She was really, really wonderful... she was South African...some people feel better talking to another African-American [to remain in their] their comfort zone,”* Mary said.

2a. Improvement: Longer Treatment/Exposures. In terms of areas for improvement, having longer treatment or more exposure exercises was identified by two participants (50%). Angela (age

² Participants have been given pseudonyms different than their actual names.

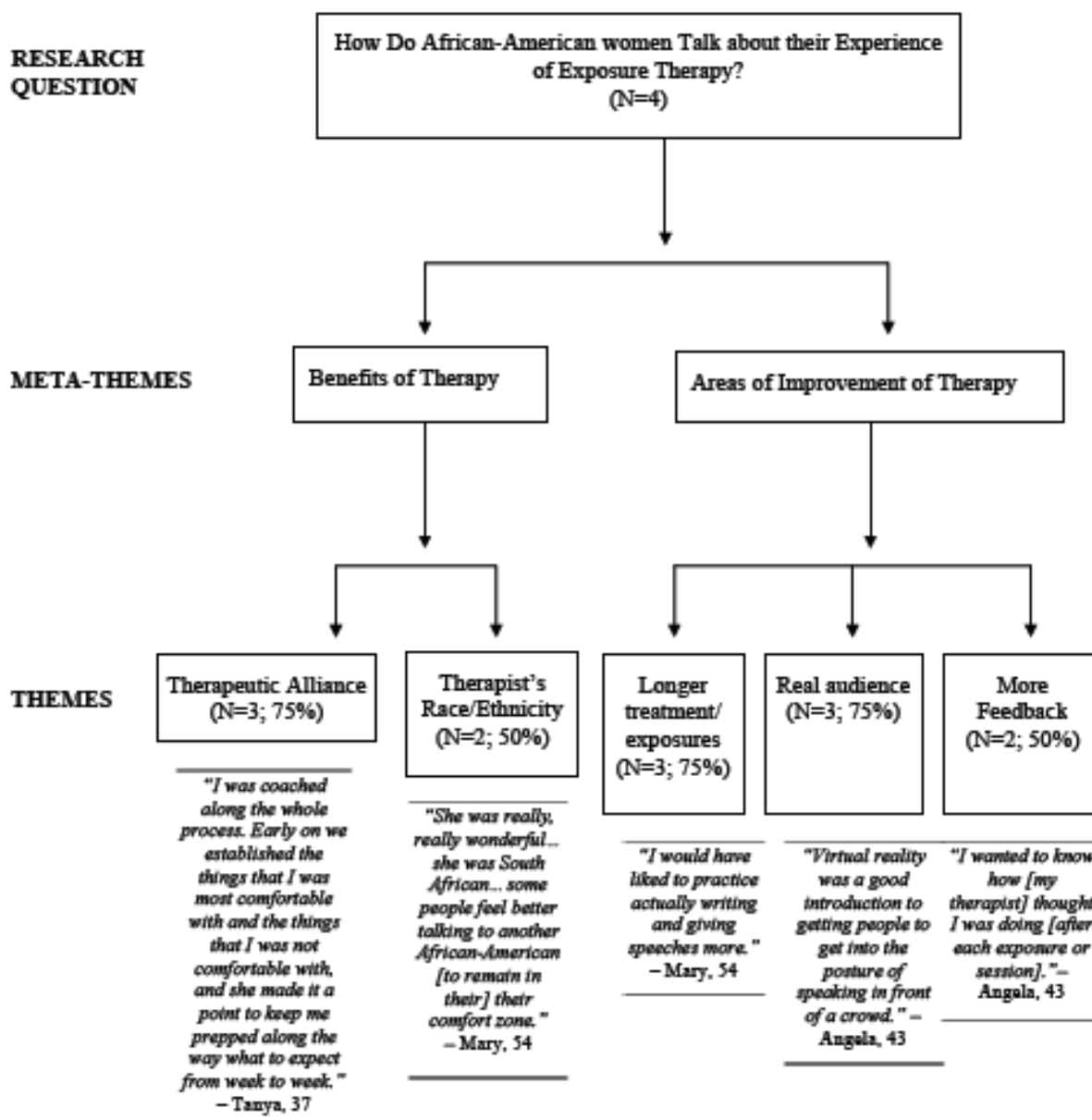


Figure 3: A pictorial representation of qualitative meta-themes and themes. Names used in the graph are not the real names of participants.

43) said that she would have liked treatment to have been twice as long (16 weeks). Mary (age 54) said, *“I would have liked to practice actually writing and giving speeches more.”*

2b. Improvement: Real Audience. Another identified area for improvement was the amount of real-audience exposures. Of the three participants (75%) that indicated wanting real-audience practice, all noted that they would want real audiences in addition to virtual reality. Angela (age 43) said that *“Virtual reality was a good introduction to getting people to get into the posture of speaking in front of a crowd.”*

2c. Improvement: Feedback. The amount of feedback given during therapy was another identified area for improvement. Two participants (50%) reported wanting more evaluative feedback. In particular, Angela stated that, *“I wanted to know how [my therapist] thought I was doing [after each exposure or session].”*

4. DISCUSSION

The findings from the current study suggest that there are both differences and similarities in engagement in VRE - as operationalized by presence - between African-American and Caucasian women treated for social phobia. Where group differences emerged (on the total IPQ scale and the realness subscale), African-American participants scored higher than Caucasian participants. Group differences on the involvement subscale also approached significance, with higher scores among African Americans than Caucasians.

The finding that African Americans reported higher levels of presence than Caucasians contrasts with much of the previous literature comparing African Americans to other ethnic and racial groups on their engagement in and responses to various psychotherapies. Indeed, findings from past research tend to portray African Americans within a deficit framework (Kohn, Oden, Muñoz, Robinson, & Leavitt, 2002; Organista et al., 1994; Whaley & Davis, 2007) and tend to emphasize high attrition rates for African-American participants (Organista et al., 1994; Sue et al., 1991). For the current study, the bulk of the drop outs occurred in Trial 2, which included not only 8 sessions of VRE, but also a pre-treatment and post-treatment fMRI scan. However, for Trial 1, there were *no* dropouts for those participants originally assigned to VRE. This alludes to another area in need of further research, treatment acceptability. Additional research examining treatment acceptability for exposure therapy in general, and virtual reality exposure therapy in particular, with addition to potential group differences is clearly needed.

Future research may also examine whether group differences in presence are associated with better treatment outcomes. In the current study, we were unable to investigate treatment outcome due to power limitations. Empirical research suggests that presence is related to self-reported levels of anxiety among clinical samples while encountering a virtual environment (Price & Anderson, 2007; Regenbrecht et al., 1998; Robillard et al., 2003). Furthermore, recent research suggests that presence is a predictor of positive treatment response to virtual reality exposure therapy (Price et al., 2011). Thus, it is plausible that the higher levels of presence

among African Americans observed in the current study might also be associated with better treatment response, which is a logical avenue for future work.

The qualitative analysis highlighted benefits of the experience of VRE for social anxiety in a sample of African-American women. The first benefit for the majority of the women was positive aspects of the therapeutic alliance, particularly feeling support and guidance from the therapist. This identified theme may support the body of research that delineates the advantages that cognitive-behavioral therapy (CBT) offers for women of color. For example, the collaborative nature of defining problems, problem-solving and formulating exposures together in CBT demonstrates respect for the client and acknowledges her ability to be in control of her life and to make necessary changes (Lewis, 1994). The client is not subjugated by the authority of the therapist. Although the importance of the therapeutic rapport is highlighted across theoretical orientations (Williams & Chambless, 1990), the dynamic of respect and equality inherent in CBT may be key for women of color, who may often experience subordination due to race and gender (Comas-Diaz & Greene, 1994). Furthermore, this may be particularly salient in the treatment of African-American women with social phobia, given the inherent fears of negative evaluation in social phobics.

In addition, participants highlighted having a therapist from a similar ethnic or racial background as a benefit to their experience. As suggested by previous research, which has identified therapist characteristics as predictors of treatment outcome (Williams & Chambless, 1990), ethnic or racial background may be one characteristic that is particularly salient to African-American women. This emerging theme is consistent with the SBW paradigm, which suggests that given that African-American women are less likely to disclose distress to healthcare providers, a context of a trusting relationship is an important facilitator of the therapy process (Romero, 2000). Indeed, in a meta-analytic review of preferences, perceptions and outcomes of therapist racial/ethnic matching in mental health services, Cabral & Smith (2011) found that, unlike other ethnic groups (e.g. European American, Asian), African Americans on average very

strongly preferred to be matched with African-American therapists, tended to evaluate African-American therapists more positively than other therapists, and displayed mildly better outcomes when matched with African-American therapists. The researchers posited that strong racial/ethnic identification and bias concerns about White therapists likely contributed to these findings. Having a therapist of a similar background may facilitate trust building for African-American women, in that they may feel better understood by their therapist, as suggested by participant responses. Noteworthy, when asked their preference for the gender and race of their interviewer, seventy-five percent of the participants in the qualitative study requested an African-American female interviewer. Future research should further explore the effects of racial and ethnic therapist matching, particularly for African American clients.

The qualitative analysis also highlighted areas of improvement in the experience of VRE for African-American women. The majority of women reported that they would have liked real-audience exposures in addition to the virtual environments. Although previous research has shown that VRE is effective for social anxiety (Anderson et al., 2005; Anderson et al., 2007), the current study is the first to date that has conducted follow-up qualitative research on VRE. It may be that even though VRE is effective at significantly reducing symptoms of social anxiety on self-report measures and behavioral avoidance tasks, VRE alone may not be sufficient enough for the client, particularly an African-American female client, to feel as though she received the most from her therapy. Similarly, given that social phobia involves a fear of interaction with a human stimulus (e.g. conversation, speech) versus a fear of the stimulus alone (e.g. spider), VRE may not feel like a sufficient enough exposure for social phobics to feel confident about the generalizability to the real world.

Additionally, African-American female participants reported that they would have liked more feedback after exposures. This similarly suggests that perhaps VRE may not be a sufficient enough exposure for some clients, because clients are unable to get feedback from the audience in virtual environments as they might in an in vivo confederate exposure. Further-

more, perhaps African-American women participants were interested in specific post-speech or post-session feedback because in the context of the SBW construct, the SBW should not show vulnerability, but instead appear composed and in control (Romero, 2000). This may be particularly relevant for socially anxious African-American women, who have a fear of poor performance and negative evaluation in social situations, yet strive to embody a culturally idealistic appearance of strength.

Finally, participants indicated wanting longer treatment as an area of improvement in their experience of VRE. Post-treatment outcome research indicates that even after treatment many individuals have symptoms that persist or remit after time (Antony, Ledley, & Heimberg, 2005). Furthermore, patients who complete CBT still have poorer quality of life than those without a psychological disorder (Eng, Coles, Heimberg, & Safren, 2001). It is likely that although effective at reducing self-reported anxiety symptoms, VRE 8-session (4 exposure) treatment packages may not feel sufficient for some clients, particularly African-American women, to feel confident in their success. Thus future research is needed to further examine factors that influence individuals' experiences of therapy in order to improve self-efficacy and treatment acceptability.

In the current study African-American women reported higher levels of presence during VRE than Caucasian women and in a qualitative analysis of their experience of exposure therapy African-American women indicated that positive aspects of the therapeutic alliance and therapist characteristics benefited their treatment experience. Thus, it is possible that good rapport and the therapists' ethnic identity, at least for African-American women contribute to a greater "buy in" or commitment to the treatment, thus resulting in more engagement or presence in the process. Conversely, it may be that since VRE involves less interaction with real people (e.g. the therapist, the exposure environments), rapport and building trust were not as necessary. However, African-American participants also reported that they would have liked more real-audience exposures and feedback from their therapists. Future research is needed to ex-

amine not only engagement or the experience of exposure therapy for African-American women and other minority populations, but specific factors that might influence the experience of treatment and provide avenues to target treatment under utilization in underrepresented populations.

There are some limitations of the current study. First, the research question comparing African Americans to Caucasians could inadvertently reinforce the notions of a “white standard” in research (Jones, 1991). Future research should consider within-group differences (e.g., Are levels of presence different among African Americans with varying levels of computer experience?). Second, the current study assessed race/ethnicity using a forced-choice, self-report item on a demographic questionnaire. Other researchers have criticized this approach on the grounds that it yields little contextual data and thus provides very limited information about within-group heterogeneity. Future research should include measures that better capture contextual data. For example, the use of the Multidimensional Inventory of Black Identity, would allow for assessment of how racial identity might influence VRE. For example, African-American participants with low levels of public regard – a MIBI subscale assessing how well one believes others’ view African Americans as a group – may be associated with engagement in exposure therapy or even willingness to participate in treatment. A third limitation relates to the IPQ as a measure of presence, as it is relatively novel and validation data are still sparse (Schubert et al., 2001). However, the measure is an integration of reliable and validated measures of presence (Witmer & Singer, 1998) that captures both the subjective experiences of presence as well as reported evaluations of the technology of VRE.

A final limitation of both the quantitative and qualitative and qualitative components of the study had a relatively small sample size ($N = 34$ and 4 , respectively), with a higher proportion of Caucasian than African-American women in the quantitative sample. Thus, the generalizability of the results and their application to theory is limited. Although this is one of the largest samples of individuals with social phobia to receive VRE in the literature, and the only study

to include qualitative data on VRE, the novelty of the present findings and the small sample sizes warrant replication in larger and more diverse populations.

Despite these limitations, this study has notable strengths, including being the first to examine the experience of exposure among women across two racial groups, as assessed by presence within the context of virtual reality exposure therapy, and the first to conduct a follow-up qualitative analysis of the experience of VRE for African-American women. The results suggest that differences in presence can be identified between groups. Specifically, results showed that African-American women reported equal or higher levels of presence than their Caucasian counterparts. Furthermore, qualitative results highlighted salient benefits and areas of improvement of exposure therapy for African-American women. Future research is needed to better understand differences in exposure therapy both within and amongst groups, to examine whether such differences impact treatment outcome, and to explore salient factors that influence groups' experience of exposure. The use of VRE and qualitative interviews offer several methodological advantages to answer such questions.

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