

Culturally Adapted Versus Standard Exposure Treatment for Phobic Asian Americans: Treatment Efficacy, Moderators, and Predictors

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This study is a 6-month follow-up of a randomized pilot evaluation of *standard* one-session treatment (OST-S) versus *culturally adapted* OST (OST-CA) with phobic Asian Americans. OST-CA included seven cultural adaptations drawn from prior research with East Asians and Asian Americans. Results from 1-week and 6-month follow-up show that both OST-S and OST-CA were effective at reducing phobic symptoms compared with self-help control. Moreover, OST-CA was superior to OST-S for several outcomes. For catastrophic thinking and general fear, moderator analyses indicated that low-acculturation Asian Americans benefitted more from OST-CA than OST-S, whereas both treatments were equally effective for high-acculturation participants. Although cultural process factors (e.g., facilitating emotional control, exploiting the vertical therapist-client relationship) and working alliance were predictive of positive outcomes, they did not mediate treatment effects. This study offers a potential model for evaluating cultural adaptation effects, as well as the mechanisms that account for such effects.

Keywords: cultural adaptation, cultural sensitivity, Asians, treatment outcomes, exposure therapy

Conducting evidence-based treatments (EBTs) with ethnic minority individuals presents unique challenges for clinicians and clinical researchers. Because most EBTs are validated with European Americans (APA Presidential Task Force on Evidence-Based Practice, 2006), manualized treatments may fail to account for ethnic minority beliefs and customs that affect therapy process. Thus, cultural mismatch could dilute the efficacy of EBTs when applied to differing ethnic minority groups (Leong, Wagner, & Tata, 1995). Yet, incorporating cultural dimensions into clinical practice might prove equally perilous given limited research and diverse perspectives on cultural competence in psychotherapy.

Though cultural adaptations are often recommended when working with minority populations (Hall, 2001; Hwang, 2006; Zane, Enomoto, & Chun, 1994), there are no consensus guidelines for adapting interventions with any particular ethnic group (Fuertes & Gretchen, 2001). Moreover, meta-analytic research is equivocal as to whether cultural adaptations actually benefit ethnic minorities (Huey & Polo, 2008; Smith, Constantine, Dunn, Dine-

hart, & Montoya, 2006). As a result, the treatment outcome literature says little about the efficacy of treatment-related cultural enhancements and even less about the mechanisms through which cultural factors might operate.

To address this gap, we compared *standard* one-session treatment (OST-S) to *culturally adapted* OST (OST-CA) in a pilot study with phobic Asian Americans (Huey & Pan, 2006). OST is a manualized (Öst, 1997), *in vivo* exposure-based treatment that occurs within a single 2- to 3-hr session. OST is highly effective in treating a variety of phobias (Öst, 1989, 1997), and many consider it the treatment of choice for specific phobias (Barlow, Lawton, & Vitali, 1998; Choy, Fyer, & Lipsitz, 2007). Despite the high levels of specific fears and phobias among Asians (Davey et al., 1998; Shore & Rapport, 1998; Zhang & Snowden, 1999), no randomized trials have evaluated the effectiveness of any phobia treatments with East Asian samples.

In this pilot trial, initial results with the first 15 participants showed that both OST-S and OST-CA were more effective than self-help and that OST-CA was superior to OST-S for several outcomes (Huey & Pan, 2006). However, the sample size in this earlier study was not sufficient to discern *why* cultural adaptations improved outcomes or whether client characteristics influenced treatment effects. Also, long-term treatment efficacy was not assessed in this earlier evaluation. Thus, the current study included 15 additional participants, involved a 6-month follow-up assessment, and assessed potential moderators and mediators of treatment effects.

Our model for cultural adaptation effects assumes that when culture is ignored in the treatment context, miscommunication and value conflicts arise, leading to client discomfort, low therapeutic engagement, and subsequent treatment failure (Huey & Pan, 2010). Thus, consistent with other cultural competence perspectives (Fuertes & Gretchen, 2001), we argue that our cultural enhancements might work by increasing client comfort and cultural/therapeutic engagement, which should lead to greater fear

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processing (Foa & Kozak, 1986) as exposure becomes more tolerable to the client. In turn, increased fear processing should lead to lower posttreatment symptomatology.

Given our earlier findings and current theoretical model, we hypothesize that OST-S and OST-CA will be superior to self-help control and that cultural adaptation will enhance the efficacy of OST. We also hypothesize that acculturation level will moderate treatment effects such that OST-CA will be most effective for less acculturated participants. Finally, our theory of change (Huey & Pan, 2010) suggests that therapy process factors (e.g., cultural engagement, therapist-client working alliance, fear habituation) will be predictive of treatment effects, and possibly mediate the effects of OST-CA (vs. OST-S) on fear outcomes.

Method

Participants and Design

Participants were recruited via e-mail and flyers at a private 4-year university on the West coast. Forty respondents were screened for eligibility, with 30 meeting the following inclusion criteria: (1) East Asian ethnicity, (2) response of 5 or higher on fear (0 = *no fear*, 8 =

very severe fear) and phobic avoidance (0 = *never avoids*, 8 = *always avoids*) based on the Anxiety Disorders Interview Schedule for Diagnostic and Statistical Manual for Mental Disorders, Fourth Edition (*DSM-IV*) (ADIS-IV; Brown, Di Nardo, & Barlow, 1994), (3) fluency in English, (4) 18 years of age or older, (5) no history of fainting, heart disease, or cardiac arrhythmia, and (6) unable to reach the final step of a behavioral approach test (BAT) conducted during the pretreatment assessment (T1).

Figure 1 displays a flowchart of the study's recruitment, allocation, follow-up, and analysis. At T1, 40 potential participants were assessed for eligibility. The study included 30 primarily female (67%) undergraduate (80%) participants with an average age of 22.1 years that were randomized to treatment conditions. Based on the ADIS-IV, 33% of the sample met all seven *DSM-IV* diagnostic criteria for specific phobia, and 100% met at least five of seven criteria. Ninety percent reported a primary fear of spiders. The remaining participants were fearful of crickets, worms, or dead fish.

Participants were randomly assigned to OST-CA, OST-S, or self-help control. Participants randomized to an active treatment condition (OST-S or OST-CA) were scheduled for the treatment session 1 week after the T1 assessment. A posttreatment assess-

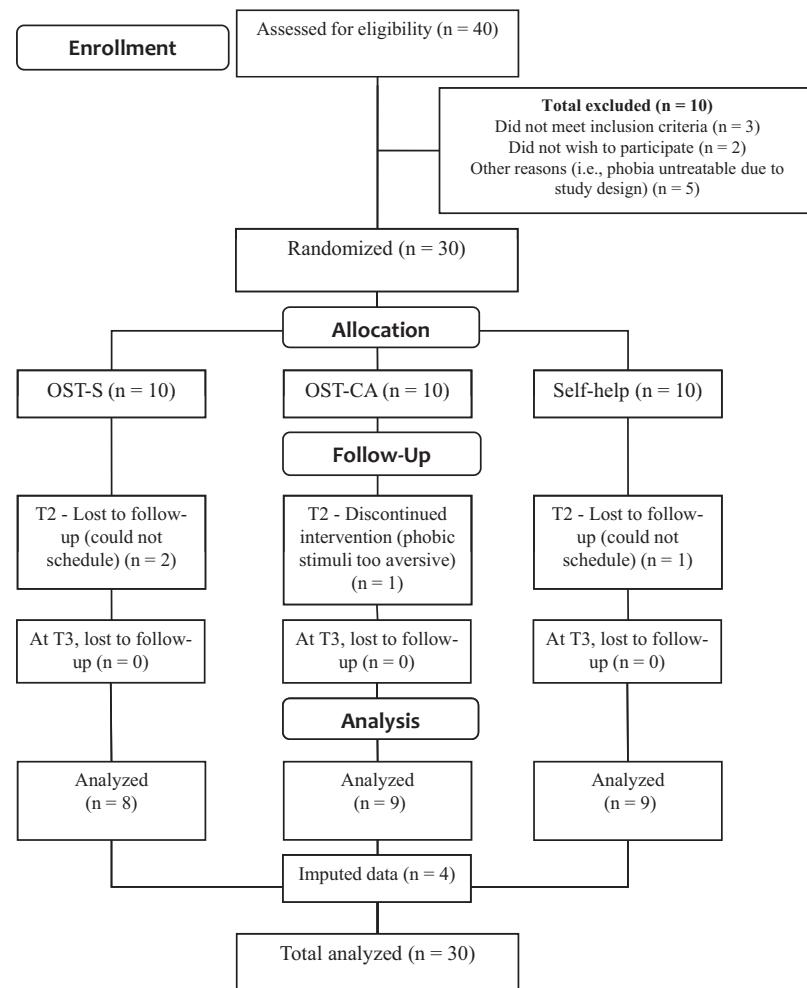


Figure 1. Flowchart of study's recruitment, allocation, follow-up, and analysis.

ment was scheduled 1 week later (T2). T2 for control participants was scheduled 1 week following T1. All participants were contacted again 6 months later for a final follow-up assessment (T3). To compensate for their time, participants were paid \$25 for each completed assessment.

Measures

Unless otherwise noted, the following measures were taken during each assessment.

Behavioral assessment. The BAT assessed participants' avoidance of phobic stimuli and associated anxiety (Öst, 1989; Öst, Svensson, Hellström, & Lindwall, 2001). Using spiders as an example, participants were asked to attempt 13 increasingly anxiety-provoking steps (e.g., 12 = *participant holds spider for at least 20 seconds*). When participants would not continue to a higher step or successfully complete the final step, they were asked for their final subjective units of distress (SUDs) rating on a scale of 0 to 100. Finally, the therapist rated the severity of fear response during the BAT on a 0–8 scale. The BAT is a well-established measure of behavioral avoidance used in numerous studies on treatment of phobias (Hellström & Öst, 1995; Steketee, Chambless, Tran, & Worden, 1996).

Self-report measures. The Fear Survey Schedule III (FSS; Wolpe & Lang, 1964) was used to assess general fear. Participants were asked to rate their fear of 108 objects and situations on a 5-point scale ($\alpha = .98$). The 8-item Fearful Thoughts Questionnaire (FTQ; Antony, Craske, & Barlow, 1995) assessed participants' anticipated catastrophic thoughts when encountering the feared stimuli ($\alpha = .86$). DSM symptom count was assessed by summing responses to five core criteria for specific phobia from the ADIS-IV: (1) marked or persistent fear, (2) exposure provokes immediate anxiety response, (3) recognition that fear is excessive or unreasonable, (4) avoidance of phobic situation, and (5) situation causes significant distress and interference. The specific phobia section of the ADIS-IV has good reliability (Brown, Di Nardo, Lehman, & Campbell, 2001). At T1 only, acculturation level was measured using the Asian Values Scale (AVS-R; Kim & Hong, 2004), which assesses participants' adherence to traditional Asian cultural values (e.g., "One should not be boastful"). The AVS-R uses a 5-point scale, with higher scores being indicative of greater adherence to Asian values ($\alpha = .74$). Finally, at T1 only, demographic information was obtained using a questionnaire developed for this study.

Treatment Description

OST-S. As noted earlier, OST-S is a brief *in vivo* exposure treatment (Öst, 1997). At T1, a functional assessment is conducted to construct an individualized fear hierarchy. During the treatment session, the therapist models nonphobic responses to phobic stimuli which participants are then asked to mimic. Throughout treatment, the therapist asks participants to periodically report their SUDs ratings. When SUDs ratings drop below 30 during an exposure step, the therapist then moves to the next step on the hierarchy. The session concludes once the final step on the fear hierarchy is completed or when 3 hrs have elapsed.

OST-CA. OST-CA is identical to OST-S except for the inclusion of seven research-based, cultural adaptations (Huey &

Pan, 2005) integrated into the T1 functional assessment and treatment session. Because Asian Americans underutilize mental health services and terminate treatment earlier than European Americans (U.S. Department of Health & Human Services, 2001; Zhang, Snowden, & Sue, 1998), these adaptations were primarily designed to better engage Asian Americans in the treatment process. The adaptations resulted from a multistep process that involved (1) reviewing psychological research with implications for treatment with East Asian populations and developing broad criteria for Asian-focused cultural adaptation; (2) reviewing the OST treatment protocol and identifying procedures and practices that were amenable to adaptation without altering the length, intensity, or "character" of OST; (3) developing an initial set of general and OST-specific adaptations for Asian Americans based on the literature review; (4) testing the viability of these adaptations in a small pilot sample then refining; and (5) selecting a final set of 7 adaptations that complemented but did not conflict with standard OST practices. Although the adaptations were based primarily on research evidence, most were also consistent with clinical recommendations made by Asian American scholars (Chen, 1995; Chen & Davenport, 2005; Lin, 2002).

Briefly, the 7 adaptations involved: (1) assessing and addressing the participant's cultural background and acculturation status (*acculturation focus*); (2) evaluating and addressing the participant's explanatory model of the target problem (*explanatory model*); (3) normalizing the target problem (*normalization*); (4) emphasizing confidentiality (*confidentiality*); (5) emphasizing and facilitating emotional control (*emotional control*); (6) exploiting the vertical nature of the therapeutic relationship (*vertical relationship*); and (7) providing extensive psychoeducation (*psychoeducation*). For example, *vertical relationship* draws on research showing that Asian Americans are more likely than European Americans to endorse the legitimacy of authority and social hierarchy (Kim, Atkinson, & Yang, 1999; Wink, Gao, Jones, & Chao, 1997); that Asian Americans prefer directive, solution-oriented counseling (Atkinson & Matsushita, 1991; Exum & Lau, 1988; Li & Kim, 2004); that Asian Americans who work with more directive therapists report a greater working alliance with those therapists (Kim, Li, & Liang, 2002); and that Asian Americans show higher levels of intrinsic motivation and performance in problem-solving when decisions are made by trusted authority figures (Iyengar & Lepper, 1999). Therefore for OST-CA, the therapist adopted an authoritative stance by making *directive* statements to clients (e.g., "Let's have you try that step now"), rather than *nondirective queries* (e.g., "Would you like to try this step?") that were typical of OST-S.

Similarly, our *emotional control* adaptation derives from research showing that Asian Americans are more likely to value calmness, to conceal "disruptive" thoughts and feelings, and to consider emotional disclosure as inappropriate and less likely to disclose traumatic experiences to others and be emotionally expressive compared with other ethnic groups (Soto, Levenson, & Ebling, 2005; Tsai & Levenson, 1997; Tsai, Levenson, & McCoy, 2006). Verbal expression of negative emotions may be perceived by Asians as a counterproductive response that triggers social discomfort, whereas stoicism may help maintain harmony by avoiding the imposition of one's feelings on others (Ino & Glick, 1999; Kim, Atkinson, & Umemoto, 2001). OST was therefore modified in two ways to better address potential concerns over inadequate emotional control. First, early in the OST-CA session,

the therapist explicitly described OST as a self-control method that helps participants better control their emotional reactions in fearful situations. The second change required the therapist to reframe anxiety reporting as a cognitive activity. In standard OST, clients were periodically asked to report their SUDs to evaluate how anxious they felt in response to feared situations. However, with OST-CA, we implemented a simple semantic change that reframed SUDs reporting from an affective to a cognitive task. Specifically, subjects in the culturally adapted condition were told to report their "SUDs thoughts" over the course of treatment. A supplemental treatment manual (Huey & Pan, 2005) describes all seven cultural adaptations in greater detail.

The adaptations were designed to be particularly salient for Asians Americans but not overtly specific to this ethnic group. Thus, we surmised that our adaptations would be particularly relevant for less acculturated Asian Americans without appearing awkward or irrelevant to highly acculturated Asians. To assess the subtleness of our cultural adaptations, OST participants were asked at treatment termination to "guess" whether they had been assigned to "standard treatment" or "culturally adapted treatment." Consistent with our prediction, *all* participants in *both* conditions believed they had been assigned to standard treatment.

Self-help control. Participants in the self-help condition were given a manual titled *Mastery of Your Specific Phobia* (Antony et al., 1995) and instructed to read it and follow all appropriate steps given their phobia.

Therapy Process

All videotaped OST sessions were coded for protocol adherence and treatment differentiation using a 46-item coding scale.¹ Some items were designed to represent elements that are common to both OST-S and OST-CA (e.g., exposure, modeling). For example, the item "Therapist exposed client to things he or she was afraid of" represents *exposure*, a central component of both OST-S and OST-CA. Additional items assessed therapy elements representing the cultural adaptations (e.g., vertical relationship, emotional control). For example, the item "Therapist took control of the session" reflects the *vertical relationship* adaptation.

Two coders blind to treatment condition individually viewed all treatment sessions and used the coding scale to rate the therapy elements. Each session was divided into three segments of equal length, which produced 51 segments to code. Codes for each therapy element were then averaged across segments to produce scores for each treatment session. The average of both coders' scores was then calculated, resulting in the final therapy element codes. Coding of the segments showed good interrater reliability (mean intraclass correlation = .91).

Additional therapy process variables included within-session habituation (i.e., level of decrease in fear during exposure), duration of in-session exposure, and therapeutic working alliance. To measure within-session habituation, the final SUDs level was subtracted from the highest SUDs level reported during the session (Jaycox, Foa, & Morral, 1998). Duration of exposure was taken as the time between the first SUDS rating and the final SUDS rating. Finally, to assess therapeutic working alliance, the 12-item Working Alliance Inventory (WAI; Horvath & Greenberg, 1989) was completed by the participant ($\alpha = .75$) and therapist ($\alpha = .74$)

immediately following treatment, and by a blind observer ($\alpha = .76$) after viewing a videotape of the session.

Results

Attrition

Of the 30 participants recruited, 87% completed both the T2 and T3 assessments. Two dropped out from OST-S, one from OST-CA, and one from self-help. There were no significant differences between treatment completers and dropouts on age, gender, or level of acculturation. For all intent to treat analyses except those involving the treatment process variables, missing values were generated using multiple regression imputation.

Pretreatment Differences

T1 dependent variables were analyzed using one-way analysis of variance (ANOVA) tests and no significant group differences were found. In addition, no group differences were found by age, gender, or level of acculturation.

Behavioral Assessment

Analyses were conducted to determine whether OST-S and OST-CA were more effective than control at reducing behavioral avoidance and whether the cultural adaptations provided unique treatment benefits. To compare outcomes for the three conditions, a series of analysis of covariance (ANCOVA) tests were conducted using pretreatment scores as covariates. For all ANCOVA analyses, adjusted means are reported.

Results from the three behavioral assessment outcomes are displayed in Figure 2. Partial eta-squared (η_p^2) was selected as the index of effect size: 0.01–0.06 = small effect, 0.06–0.14 = moderate effect, and >0.14 = large effect (Cohen, 1973). Significant treatment effects were found for the BAT at T2, $\eta_p^2 = .71$, $F(2, 26) = 31.20$, $p < .001$, and T3, $\eta_p^2 = .72$, $F(2, 26) = 33.15$, $p < .001$. Tukey's least significant difference (LSD) comparisons showed that at T2 and T3, both OST-S (T2: $M = 10.62$, $SE = .38$; T3: $M = 10.85$, $SE = .39$) and OST-CA (T2: $M = 11.40$, $SE = .38$; T3: $M = 11.57$, $SE = .39$) participants were able to complete more steps on the BAT than controls (T2: $M = 7.32$, $SE = .38$; T3: $M = 7.24$, $SE = .40$).

Significant effects were found for final SUDs at T2, $\eta_p^2 = .42$, $F(2, 26) = 9.33$, $p < .01$, and T3, $\eta_p^2 = .30$, $F(2, 26) = 5.50$, $p < .05$. Tukey's LSD comparisons showed that at T2, both OST-S ($M = 41.24$, $SE = 6.73$) and OST-CA ($M = 18.69$, $SE = 6.77$) were effective at reducing final SUDs compared with control ($M = 60.31$, $SE = 6.78$). At T3, only OST-CA ($M = 22.81$, $SE = 8.39$) was effective at reducing final SUDs when compared with control ($M = 62.35$, $SE = 8.39$).

Significant effects were found for therapist-rated fear at T2, $\eta_p^2 = .64$, $F(2, 26) = 22.67$, $p < .001$, and T3, $\eta_p^2 = .47$, $F(2, 26) = 10.88$, $p < .001$. Tukey's LSD comparisons showed that at T2, only OST-CA ($M = 1.45$, $SE = .43$) was effective at

¹ For coding purposes, only OST treatment sessions were viewed and coded. The T1 functional assessment contained many of the cultural adaptations, but were not coded or included for this study.

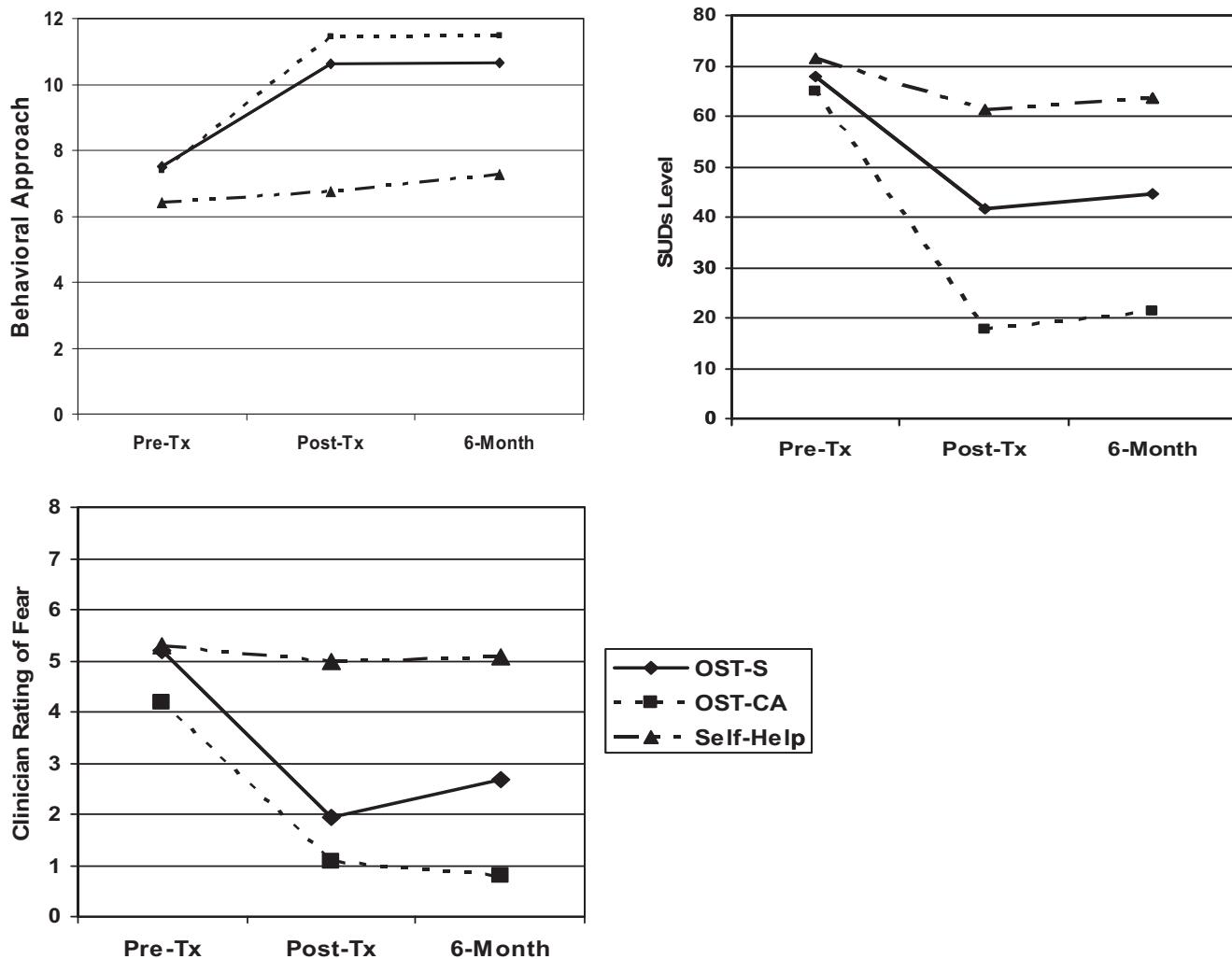


Figure 2. Steps completed on behavioral approach test (BAT) (top left), final subjective units of distress (SUDs) during the BAT (top right panel), and therapist-rated fear during the BAT (bottom left), by treatment condition.

improving the therapist's ratings of participant fear compared with control ($M = 4.94$, $SE = .42$), while at T3, both OST-S ($M = 2.32$, $SE = .60$) and OST-CA ($M = .99$, $SE = .62$) were effective compared with control ($M = 4.99$, $SE = .60$). OST-CA and OST-S were not significantly different from one another for any of the behavioral assessment outcomes.

Self-Report Measures

Significant treatment effects were found for general fear, catastrophic thinking, and DSM symptom count. Table 1 shows the adjusted means and summaries of group differences. At T2, OST-CA was more effective at reducing general fear and catastrophic thinking compared with both OST-S and control. At T3, both OST-S and OST-CA were more effective than control at reducing general fear and catastrophic thinking. OST-S and OST-CA were also more effective than control at reducing DSM

symptoms at T2. However, at T3, only OST-S was effective at reducing DSM symptoms compared with control.

Treatment Moderators

The mean score for participants on the AVS was 2.46 ($SD = .26$), which can be interpreted as a medium level of acculturation (Kim & Hong, 2004). No significant acculturation differences were found between conditions.

To assess whether treatment effects differed by acculturation level, moderator analyses were conducted using hierarchical linear regression (Holmbeck, 1997). Because we were interested in moderation effects for the active treatment conditions, only OST-S and OST-CA were included in the following analyses. Pretreatment outcome scores were entered first in Step 1 of the model, followed by treatment condition and acculturation as main effects in Step 2, and finally the interaction between treatment condition and acculturation in Step 3.

Table 1

Multiple Comparison Tests on Adjusted Means and SE for Self-Report Anxiety at 1-Week (T2) and 6-Month Follow-Up (T3)

Variable and time point	OST-S	OST-CA	Self-help	Effect size (η_p^2)	Group differences ^a
General fear					
T2	117.66 (12.3)	78.94 (12.3)	123.37 (12.4)	.23	OST-CA < OST-S, OST-CA < Self-help
T3	108.51 (16.22)	83.70 (16.25)	170.22 (16.28)	.36	OST-S < Self-help, OST-CA < Self-help
Catastrophic thinking					
T2	2.86 (.44)	0.99 (.44)	3.34 (.44)	.38	OST-CA < OST-S, OST-CA < Self-help
T3	1.74 (.40)	1.60 (.40)	3.35 (.40)	.32	OST-S < Self-help, OST-CA < Self-help
DSM symptom count					
T2	0.90 (.35)	1.00 (.36)	3.56 (.35)	.58	OST-S < Self-help, OST-CA < Self-help
T3	1.03 (.45)	1.57 (.46)	2.78 (.45)	.23	OST-S < Self-help

Note. T2 = Time 2; T3 = Time 3; OST-CA = culturally-adapted one-session treatment; OST-S = standard one-session treatment; DSM = *Diagnostic and Statistical Manual*. The means are adjusted on the basis of Analysis of Covariance tests using pretreatment scores as covariates.

^a Unless otherwise noted, all differences are significant at $p < .05$, using Tukey's Least Significant Difference tests.

We tested 12 interactions, which reflect analyses of each time point (T2 and T3) and the six outcome measures, three of which were significant or marginally significant. Table 2 summarizes the three moderation models that yielded significant or marginally significant

effects. Marginally significant interaction effects were found for T2 catastrophic thinking and T2 general fear. For post hoc analyses, separate regression lines were plotted for low- and high-acculturation participants determined by a median split (Holmbeck, 2002). The

Table 2
Results From Multiple Regression Testing Acculturation as Moderator of Treatment Outcomes

Step and variable	B	SE B	β
T2 catastrophic thinking			
Step 1			
Pretreatment catastrophic thinking	.22	.15	.32
Step 2			
Pretreatment catastrophic thinking	.26	.13	.37 ⁺
Treatment condition (OST-S vs. OST-CA)	-.95	.34	-.55*
Acculturation	-.11	.34	-.07
Step 3			
Pretreatment catastrophic thinking	.24	.12	.35 ⁺
Treatment condition	-.94	.31	-.55**
Acculturation	-.14	.31	-.08
Treatment condition \times acculturation	-.65	.31	-.36 ⁺
T2 general fear			
Step 1			
Pretreatment general fear	1.00	.16	.83***
Step 2			
Pretreatment general fear	.99	.15	.82***
Treatment condition (OST-S vs. OST-CA)	-20.05	8.35	-.29*
Acculturation	2.12	8.36	.03
Step 3			
Pretreatment general fear	.99	.13	.82***
Treatment condition	-19.97	7.66	-.29*
Acculturation	1.60	7.68	.02
Treatment condition \times acculturation	-15.73	7.86	-.22 ⁺
T3 general fear			
Step 1			
Pretreatment general fear	.93	.14	.85***
Step 2			
Pretreatment general fear	.92	.13	.84***
Treatment condition (OST-S vs. OST-CA)	-12.47	7.65	-.20
Acculturation	-2.00	7.67	-.03
Step 3			
Pretreatment general fear	.92	.12	.84***
Treatment condition	-12.39	6.71	-.20 ⁺
Acculturation	-2.56	6.73	-.04
Treatment condition \times acculturation	-16.61	6.89	-.26*

Note. OST-CA = culturally-adapted one-session treatment; OST-S = standard one-session treatment.

⁺ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .01$.

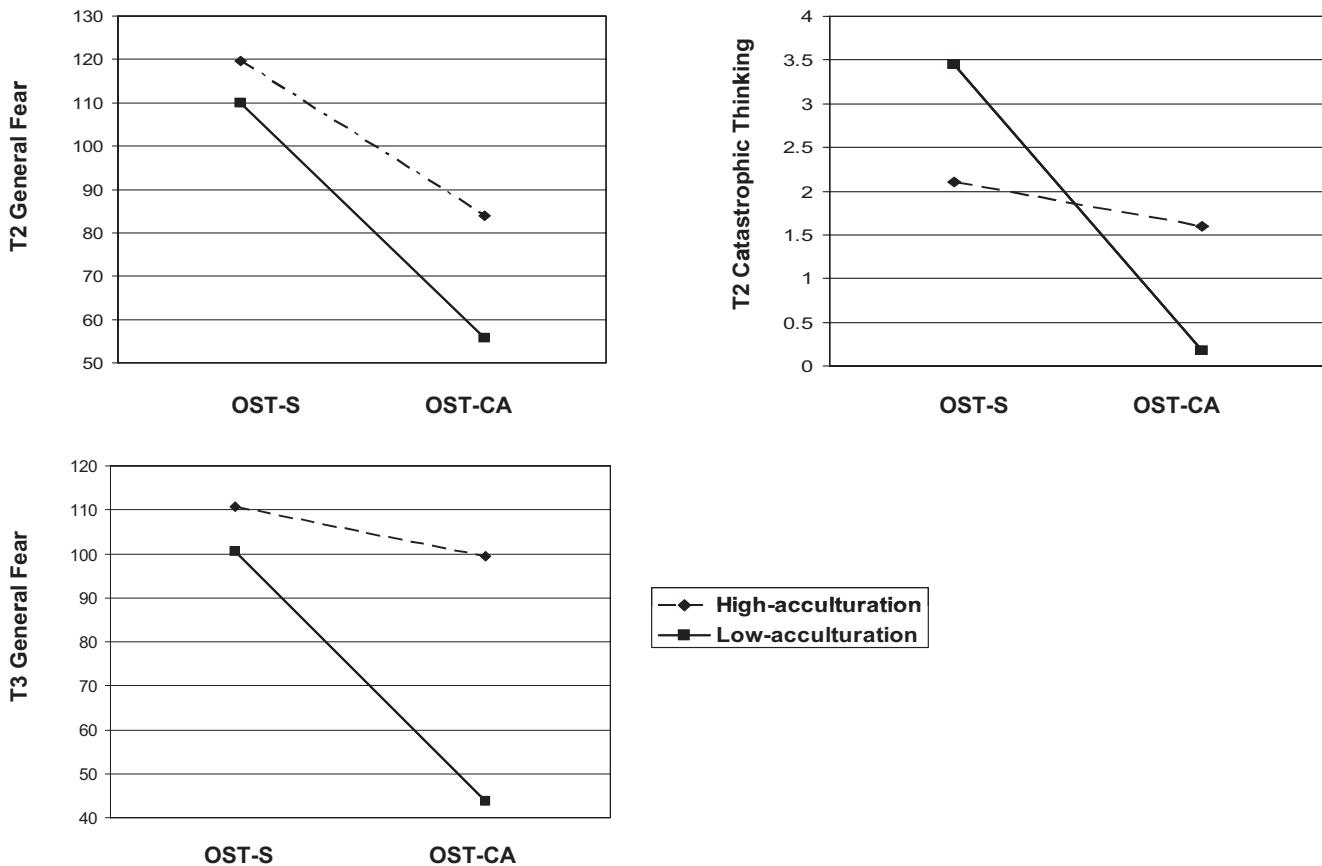


Figure 3. Moderation of T2 general fear by acculturation level, median split (top left), moderation of T2 catastrophic thinking by acculturation level, median split (top right), and moderation of T3 general fear by acculturation level, median split (bottom left).

slopes for low-acculturation Asian Americans were negative and significant for T2 catastrophic thinking, $\beta = -.92$, $p < .01$, and T2 general fear, $\beta = -.52$, $p < .01$. However, for high-acculturation participants, the slopes for T2 general fear and T2 catastrophic thinking were not significant. A significant interaction was found between treatment condition and acculturation for T3 general fear. Post hoc analyses showed that the slope for low-acculturation Asian Americans was negative and significant for T3 general fear, $\beta = -.47$, $p < .01$, while the slope for high-acculturation Asian Americans was nonsignificant. Overall, these results indicate that for less acculturated Asian Americans, reductions in catastrophic thinking and general fear are greatest when they participate in OST-CA. Graphical representations of these moderator relationships are shown in Figure 3.

Therapy Process and Outcome Predictors

ANOVA analyses showed significant group differences for three cultural content variables: normalization, $\eta_p^2 = .27$, $F(1, 16) = 5.64$, $p < .05$; vertical relationship, $\eta_p^2 = .59$, $F(1, 16) = 21.74$, $p < .001$; and emotional control, $\eta_p^2 = .93$, $F(1, 16) = 192.14$, $p < .001$ (Figure 4).² As expected, cultural content was greater for OST-CA (normalization: $M = 1.91$, $SD = .53$; vertical relationship: $M = 2.02$, $SD = .52$; emotional control: $M = 2.84$, $SD = .33$) compared with OST-S (normalization: $M = 1.41$, $SD =$

.29; vertical relationship: $M = 1.15$, $SD = .11$; emotional control: $M = 1.14$, $SD = .12$). Next, a composite “cultural engagement” score was created by averaging scores from the three cultural adaptations that significantly differentiated OST-CA from OST-S. This variable was used in subsequent predictor and mediator analyses.

No between-groups differences were found for any of the common OST therapy elements (i.e., exposure, modeling, reinforcement, and relapse prevention; Figure 4). Also, no group effects were found for habituation, exposure duration, working alliance-client, working alliance-therapist, or working alliance-observer.

To assess whether treatment process factors predicted posttreatment and follow-up outcomes, we conducted multiple regression analyses using only participants in the two OST conditions. Separate regressions were run with each posttreatment and follow-up outcome variable as dependent variables. For each regression, pretreatment measures of the dependent variable were entered first as covariates followed by the treatment process variables. Results

² Of the seven cultural adaptations, only six were included here. *Acculturation focus* was not included because variation in ratings across participants was minimal during the OST session. This adaptation was focused on primarily during the T1 functional assessment.

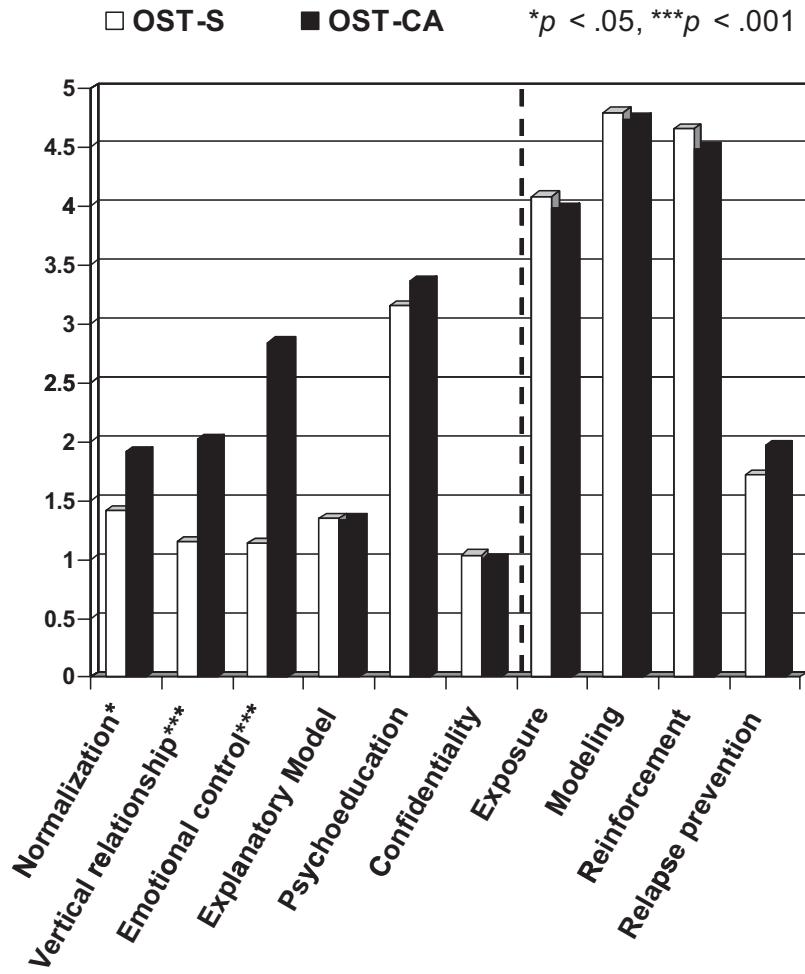


Figure 4. Independent coder ratings of culture-related and common therapy elements, by treatment condition.

are presented in Table 3, but only for process variables that predicted one or more treatment outcomes at the marginally significant ($p < .10$) level or greater.

Four cultural process factors and working alliance (client and therapist ratings) were associated with outcomes in the expected direction. Emotional control was associated with decreases in posttreatment SUDs, general fear, and catastrophic thinking. Vertical relationship was associated with decreases in general fear at posttreatment and follow-up. Psychoeducation was associated with decreases in catastrophic thinking at posttreatment and increases in behavioral approach at follow-up. The cultural engagement variable was associated with decreases in SUDs, general fear, and catastrophic thinking at posttreatment. Client-rated working alliance was associated with increased behavioral approach, and decreased SUDs and therapist-rated fear at both time periods. Therapist-rated working alliance was associated with decreases in SUDS and therapist-rated fear at follow-up, and decreases in symptom count at both time points.

Notably, there were several counterintuitive findings involving exposure-related therapy process. Specifically, the OST exposure factor was associated with an *increase* in therapist-rated fear at

posttreatment and SUDs at both time points. Similarly, exposure duration was associated with an *increase* in SUDs at posttreatment.

Treatment Mediation

Regression analyses were conducted to determine whether cultural engagement mediated treatment effects. Holmbeck (1997) draws from Baron and Kenny's (1986) four conditions that must be met for a variable to be considered a mediator: (A) the independent variable (IV; i.e., treatment condition) must be significantly associated with the mediator variable (i.e., cultural engagement), (B) the IV is significantly associated with the dependent variable (DV; i.e., treatment outcome variables), (C) the mediator variable is significantly associated with the DV, and (D) the impact of the IV on the DV is less when controlling for the mediator. According to Holmbeck (1997), these criteria can be tested with multiple regression analyses.

As expected, results indicated that treatment condition was significantly associated with cultural engagement, $\beta = .89$, $p < .001$ (i.e., test of Condition A), and with several outcomes: T2 final SUDs, $\beta = -.57$, $p < .05$, T2 catastrophic thinking, $\beta = -.56$,

Table 3

Standardized Regression Coefficients From Multiple Regression Analyses Linking Therapy Process Variables to One-Session Treatment (OST) Outcomes

	OST cultural engagement variables			Other therapy process variables				
	Emotional control	Vertical relationship	Psychoeducation	Cultural engagement composite	Working alliance-Client	Working alliance-Therapist	OST exposure	Exposure duration
Behavioral approach T1-T2	.28	.33	.36	.31	.58*	.44	-.27	-.06
Behavioral approach T1-T3	.28	.30	.42 ⁺	.37	.45 ⁺	.23	-.16	.00
SUDS T1-T2	-.49 ⁺	-.40	-.33	-.43 ⁺	-.62*	-.37	.47 ⁺	.45 ⁺
SUDS T1-T3	-.33	-.27	-.42	-.32	-.67*	-.44 ⁺	.50 [*]	.32
Therapist-rated fear T1-T2	-.18	.00	-.04	-.02	-.42 ⁺	-.22	.49*	.22
Therapist-rated fear T1-T3	-.24	-.26	-.23	-.17	-.45 ⁺	-.45 ⁺	.36	.20
General fear T1-T2	-.20*	-.23*	-.10	-.22*	-.06	-.12	.16	.09
General fear T1-T3	-.10	-.24**	-.14	-.16	-.12	-.12	.08	-.03
Catastrophic thinking T1-T2	-.57*	-.35	-.41 ⁺	-.48*	-.06	-.39	.32	.25
Catastrophic thinking T1-T3	-.02	.01	.12	.07	-.06	-.19	.08	-.06
Symptom count T1-T2	.00	.06	-.04	.07	-.46	-.74***	.21	.25
Symptom count T1-T3	.13	.08	.07	.19	-.20	-.48*	.14	.09

Note. T1 = Time 1; T2 = Time 2; T3 = Time 3; SUDs = subjective units of distress.

⁺*p* < .10. **p* < .05. ***p* < .01. ****p* < 0.001.

p < .01, and T2 general fear, $\beta = -.29$, *p* < .05 (i.e., test of Condition B). However, when treatment outcomes were simultaneously regressed on both the IV and mediating variable, no significant effects were found (i.e., tests of Condition C and D). Thus, the criteria for mediation were not met (Holmbeck, 1997).

Discussion

The number of ethnic minorities in the United States continues to grow rapidly (U.S. Census Bureau, 2008), and with this growth comes a need for increased mental health services research with diverse populations (U.S. Department of Health and Human Services, 2001). This study addressed several major gaps in the literature concerning psychotherapy outcome and process with ethnic minority populations, particularly for Asian Americans who comprise the second fastest growing ethnic group in the United States (U.S. Census Bureau, 2008).

Given the limited treatment outcome research with Asians (Leong & Lau, 2001), the most basic question concerns whether established therapies actually work with this population. As expected, both active treatments outperformed self-help at posttreatment and follow-up. These results are in line with previous research showing the efficacy of in vivo exposure for specific phobias (Choy et al., 2007; Öst, 1997) and with recent randomized trials showing that evidence-based treatments can work with Asian Americans (Otto et al., 2003; Shin, 2004). Despite the modest sample size and sample homogeneity, our findings suggest that OST is an efficacious treatment for Asian Americans.

We also found that OST-CA was more effective than OST-S for two phobia-related outcomes: general fear and catastrophic thinking. These findings are notable because while it was expected that both versions of OST would be effective at reducing phobic symptoms, the superiority of OST-CA for several outcomes suggests that our cultural adaptations provide benefits that extend beyond the standard course of treatment.

It is important to note that OST-CA effects were not uniform across participants. As expected acculturation level moderated therapy outcomes, with low-acculturation Asian Americans benefiting most from culturally adapted treatment. To date, there is minimal treatment outcome research examining the moderating effects of acculturation with ethnic minorities (Martinez & Eddy, 2005; Telles et al., 1995) and none that include Asian American populations. Among Asian Americans, acculturation level appears to affect many therapeutic variables such as working alliance (Kim et al., 2002; Kim & Omizo, 2003), attitudes toward seeking mental health services (Liao, Rounds, & Klein, 2005), and perceived therapist credibility and competence (Gim, Atkinson, & Kim, 1991). It is possible that the cultural adaptations better addressed concerns that low-acculturation individuals held regarding the utility of therapy more broadly and exposure more specifically. Although not assessed in this study, these participants may have perceived OST-CA as more comfortable and credible, thus leading to greater treatment benefits.

Of course, one critical question pertains to *why* cultural adaptations might enhance treatment effects for ethnic minorities. Although theories of multicultural counseling tend to agree that matching therapy context with the minority client's worldview enhances treatment effectiveness (Fuentes & Gretchen, 2001), they say little about potential mechanisms of action. In this study, we tested several possible mechanisms derived from therapist and participant report and observer ratings of therapy process. We found that working alliance and cultural process factors were predictive of positive therapy outcomes. Although none of these factors mediated treatment effects, previous research shows that working alliance is consistently associated with treatment outcomes (Horvath, 2006). Moreover, a small number of studies report that cultural process may predict treatment outcomes for minority participants (Gil, Wagner, & Tubman, 2004; Jackson-Gilfort, Liddle, Tejeda, & Dakof, 2001).

Notably, exposure and exposure duration were associated with increases in SUDs and therapist-rated fear over time. This finding was unexpected given that exposure is a core element of our treatment and that major theories (e.g., Foa & Kozak, 1986) place a heavy emphasis on exposure as a primary component of anxiety-focused interventions. However, rather than suggesting that therapist-directed exposure increases phobic anxiety, we argue that treatment refractory cases may have required significantly more exposure time. Thus, one possibility is that poorer responders were more reticent to approach the phobic stimuli, thus extending the amount of time spent in session trying to engage participants. By contrast, those who were more willing to engage early in treatment may have habituated more easily, advanced through the steps of their fear hierarchy more quickly, and therefore exhibited less posttreatment fear.

In addition, these findings suggest that properly designed and integrated cultural adaptations can be very subtle, yet still effective. A manipulation check was conducted after each OST session that asked participants to report whether they thought they had completed the standard or culturally adapted intervention. Every participant, regardless of OST condition, thought that they had participated in the standard course of OST. Thus, despite the understated nature of our cultural adaptations, participants appeared to benefit nonetheless. Another advantage is that the cultural adaptations did not appear to lead to an increase in treatment load (i.e., sessions were *not* longer for OST-CA participants) nor interfere with important treatment processes such as working alliance.

Though this study has many strengths, it also has several limitations, the first relating to sample size. The modest number of participants may not have provided the requisite power to detect significant effects for mediation analyses, a common problem with randomized trials (Kraemer, Frank, & Kupfer, 2006). Though full mediation analyses could not be conducted, it is encouraging that many of the conditions for mediation testing were met despite the limited sample size. Additionally, some of the moderation analyses reported were marginally significant ($p < .10$) and should be interpreted with caution. However, given the pilot nature of this study and the dearth of research on this topic, we thought it important to report these marginally significant trends to inform future research.

Other limitations include the restricted sample of undergraduate Asian Americans with specific phobias. Thus, our cultural adaptation findings may not be readily generalized to populations who differ with respect to age, ethnicity, or diagnostic status. In addition, all assessments and treatment sessions were conducted by one individual, the first author, which may have contributed to unintentional cross-contamination. However, this may be less of a concern given that the adaptations were found to be subtle and not discernible by participants, but identifiable by trained independent coders. Finally, it remains unclear which of the cultural adaptations work optimally, although therapy process analyses suggest that emphasizing emotional control and the vertical nature of the therapist-client relationship were most important.

Despite these limitations, this study might serve as a one model for how to design and evaluate treatment adaptations for diverse minority groups. Notably, our cultural adaptations were theory-driven yet derived exclusively from empirical research, an approach congruent with recent calls to action regarding interven-

tions for minorities (Bernal, 2006; Hwang, 2006; Lau, 2006). Also, prior research focused primarily on comparisons of culturally adapted treatments to no treatment or placebo control (e.g., Hinton et al., 2004; Otto et al., 2003; Rosselló & Bernal, 1999), which leaves lingering questions concerning the unique contribution of cultural enhancements. This study is one of the few to isolate cultural process effects in a clinically indicated sample (also see McCabe & Yeh, 2009; Szapocznik et al., 1986), and may be the first to show that treatment gains are attributable to culturally oriented modifications of a well-established intervention.

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