



## A Meta-Analysis of Cultural Adaptations of Psychological Interventions

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Forehand and Kotchick (1996) issued a wake-up call to the field to develop culturally responsive interventions. Since that time, 11 meta-analyses on culturally adapted interventions have been conducted. To reconcile the differences of the previous meta-analyses, a new meta-analysis was conducted that included 13,998 participants, 95% of whom were non-European American, in 78 studies evaluating culturally adapted interventions with psychopathology outcomes. Using a random effects multilevel regression model, the overall effect size ( $g = 0.67$ ,  $p < .001$ ) favored the effectiveness of culturally adapted interventions over other conditions (no intervention, other interventions). There was a medium effect size favoring the effectiveness of culturally adapted interventions over unadapted versions of the same intervention ( $g = .52$ ). The overall effect size was moderated by whether the study involved treatment ( $g = .76$ ) vs. prevention ( $g = .25$ ,  $p = .03$ ) and whether the study involved specific measures of mood or anxiety symptoms ( $g = .76$ ) vs. general measures of psychopathology ( $g = .48$ ,  $p = .02$ ). Culturally adapted interventions had 4.68 times greater odds than other conditions to produce remission from psychopathology ( $p < .001$ ) in 16 studies that reported

remission. There were greater effects in no intervention control designs (marginal odds ratio = 9.80) than in manualized intervention (marginal odds ratio = 3.47,  $p = .03$ ) or another active, nonmanualized intervention (marginal odds ratio = 3.38,  $p = .04$ ) comparison designs in remission studies. Research has yet to adequately investigate whether culturally adapted or unadapted interventions impact culture-specific psychopathology. These findings indicate a continuing need for rigor in the conceptualization and measurement of culture-specific psychopathology and in developing culturally responsive interventions.

*Keywords:* cultural adaptations; meta-analysis; ethnic minorities; psychotherapy; psychopathology

TWENTY YEARS AGO, Forehand and Kotchick (1996), in a landmark *Behavior Therapy* article, called for parent training to become more culturally responsive. They contended that all parenting occurs within a cultural context and that associations between parent behaviors and child behaviors observed in European American contexts do not necessarily apply in other cultural contexts. Forehand and Kotchick recommended a three-step process of identifying cultural contexts of behaviors, measuring cultural constructs, and then considering how such knowledge can guide research. Cultural adaptation is warranted when there are community-specific cultural contexts of risk and resilience that influence disorders (Forehand & Kotchick, 1996; Lau, 2006).

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Concomitantly, Bernal and colleagues (1995) proposed a conceptual model to enhance the ecological validity of psychological interventions via cultural adaptations. Eight dimensions along which interventions could be culturally adapted were identified: language, people, metaphors, content, concepts, goals, methods, and context. This conceptual model was successfully implemented to culturally adapt evidence-based interventions for depression to enhance their effectiveness with Puerto Rican adolescents (Rossello & Bernal, 1999; Rossello, Bernal, & Rivera-Medina, 2008). Bernal and colleagues' initial efforts spawned the development and evaluation of multiple cultural adaptation models (Bernal & Rodriguez, 2012).

The cultural adaptation of an existing evidence-based intervention is "top-down," in which an intervention developed for one group is modified for application to other groups. However, this is not the only approach to developing culturally responsive interventions. Critics of this approach contend that top-down approaches to psychological interventions do not comprehensively address important components of specific cultural contexts of psychopathology, such as cultural identity or group-based discrimination (Hwang, 2006). Such critics might advocate "bottom-up" approaches that are developed within a particular cultural context and address culture-specific concerns, rather than being imported. Unlike the top-down approach, the reference group is not another group on which an intervention was previously developed, but the particular cultural group being studied (Hall, Yip, & Zárate, 2016).

Cultural adaptations are not without their drawbacks, however. Although there is evidence that culturally adapted interventions are superior to unadapted interventions when used with diverse ethnic groups (Benish et al., 2011; Cabral & Smith, 2011; Chowdhary et al., 2014; Griner & Smith, 2006; Hodge et al., 2010; Hodge et al., 2012; Jackson, Hodge, & Vaughn, 2010; Smith, Rodriguez, & Bernal, 2011; Smith & Trimble, 2016; van Loon et al., 2013), there is not evidence that nonadapted interventions are ineffective with diverse ethnic groups. It has been contended that the inclusion of members of diverse ethnic groups in clinical trials is sufficient evidence that the evidence-based interventions are as effective, if not more effective, for these persons than they are for European Americans (Ortiz & Del Vecchio, 2013). However, simply including diverse ethnic groups in clinical trials without testing possible group differences in response to an intervention is inadequate. For instance, a selective obesity prevention program was found to produce significantly greater reductions in body mass index versus a control condition for the full sample, but moderation

analyses revealed that the prevention program only produced significant weight loss effects for Latina Americans; it was ineffective for European American and African American participants (Spieker, Herbozo, Cheng, & Stice, 2016).

A related argument is that if generic interventions are sufficiently effective among people of color, then adapting interventions to boost cultural fit for individual groups comes at an unnecessary cost. Adapted interventions risk losing their connection to the evidence base that was originally established for the intervention (Castro et al., 2004). Modifications can decrease intervention fidelity and hence intervention effectiveness (Elliott & Mihalic, 2004). Balancing fit with fidelity is a key challenge for cultural adaptation development. The most useful intervention manuals should be grounded empirically, and still allow for flexibility to fit the client's context (Kendall & Beidas, 2007). Over the past 20 years an empirical base has accumulated to allow the evaluation of the benefits of cultural adaptations relative to unadapted interventions.

Eleven meta-analyses have examined the effectiveness of culturally adapted vs. unadapted psychological interventions on clinical outcomes (Benish et al., 2011; Cabral & Smith, 2011; Chowdhary et al., 2014; Griner & Smith, 2006; Hodge et al., 2010; Hodge et al., 2012; Huey & Polo, 2008; Jackson et al., 2010; Smith et al., 2011; Smith & Trimble, 2016; van Loon et al., 2013). Effect sizes in these studies vary widely from near zero (Huey & Polo, 2008) to large effect sizes favoring culturally adapted psychological interventions (Chowdhary et al., 2014; van Loon et al., 2013). Effect sizes from previous meta-analyses of culturally adapted interventions have been found to be heterogeneous and moderated by variables including client age, client/therapist ethnic match, language of intervention (i.e., English vs. non-English), client acculturation, psychopathology outcome, and study design (e.g., culturally adapted intervention vs. no intervention, culturally adapted intervention vs. another intervention) but support for these moderators has been inconsistent, because of the different sets of studies sampled and because the effect sizes of some of the moderators have been small.

In addition to inconsistent findings, study design limitations of previous meta-analyses include consideration of post-intervention psychopathology without controlling for pre-intervention psychopathology and the use of a single effect size per study without considering all study psychopathology outcomes or aggregating study effect sizes which may attenuate outlier effects. Another design limitation is that previous meta-analyses have not isolated the effects of cultural adaptation by comparing culturally adapted interventions with unadapted versions of

the same intervention. Any incremental effects of the culturally adapted intervention can be attributed to the adaptation because this comparison condition controls for a host of possible confounds that are operating in studies that used alternative comparison conditions, such as demand characteristics and expectancy effects, as well as the potential that different interventions are differentially effective. For instance, it is likely that cognitive-behavioral therapy (CBT) is more effective than applied muscle relaxation for treating posttraumatic stress disorder, whether CBT is culturally adapted or not. However, separate analyses of the effects of culturally adapted vs. unadapted forms of the same intervention have not been conducted in previous meta-analyses. Stringent study designs are likely to produce smaller effect sizes than less stringent designs (cf. Benish et al., 2011).

An additional limitation of previous meta-analyses of culturally adapted interventions is that prevention studies have often been excluded (Benish et al., 2011; Chowdhary et al., 2014; van Loon et al., 2013). Culturally adapted interventions have increasingly been implemented in prevention research (Castro et al., 2004). Studies of treatment interventions typically produce larger reductions in outcomes because participants have higher symptom levels than do participants in studies of prevention programs. Meta-analyses that have included prevention studies have not separately considered the effects of treatment studies and prevention studies.

In sum, the issues of previous meta-analyses of culturally adapted interventions include: (a) inconsistent moderator effects; (b) data analytic and design limitations; and (c) failure to identify the specific effects of prevention studies. The purpose of the current meta-analysis is to attempt to reconcile the differences of previous meta-analyses by including studies from each of the previous meta-analyses and also analyzing studies that have been conducted since then. We examine potential moderators of intervention effectiveness, including study characteristics, study design, and cultural adaptations, that have been evaluated in previous meta-analyses. We also address the limitations of previous meta-analyses by controlling for pre-intervention psychopathology when possible, considering multiple psychopathology outcomes per study when available, and separately examining the effects of intervention vs. prevention studies. We hypothesize that culturally adapted interventions will result in greater reductions of psychopathology relative to another intervention or no intervention. Based on previous evidence (Benish et al., 2011), we hypothesize that studies with more stringent designs (i.e., comparisons of culturally adapted interventions with another non-adapted

intervention) will yield smaller effects than studies with less stringent designs (i.e., no intervention controls). We also hypothesize that culturally adapted interventions will have smaller effects in prevention studies, in which psychopathology may be relatively less severe, than in intervention studies involving existing psychopathology, which tends to be relatively more severe.

## Method

### SEARCH STRATEGIES

Eleven meta-analyses that have examined the effectiveness of culturally adapted vs. nonadapted psychological interventions on clinical outcomes were identified through a systematic literature review (Benish et al., 2011; Cabral & Smith, 2011; Chowdhary et al., 2014; Griner & Smith, 2006; Hodge et al., 2010; Hodge et al., 2012; Huey & Polo, 2008; Jackson et al., 2010; Smith et al., 2011; Smith & Trimble, 2016; van Loon et al., 2013). All published studies and dissertations determined by the authors of these meta-analyses to include a culturally adapted intervention were considered for inclusion in the present meta-analysis. We then contacted the authors of each of these meta-analyses for any supplemental information on the studies included in their meta-analyses.

Smith's most recent meta-analysis (Smith & Trimble, 2016) included the studies in all the previous Smith meta-analyses (Cabral & Smith, 2011; Griner & Smith, 2006; Smith et al., 2011) except for those with inadequate methodology (e.g., no control group). Smith and Trimble (2016) also included cultural adaptation studies that were conducted after the 2011 meta-analyses. We used the list of studies included in the Smith and Trimble (2016) meta-analysis provided by Smith to represent all the studies in the following meta-analyses (Cabral & Smith, 2011; Griner & Smith, 2006; Smith et al., 2011; Smith & Trimble, 2016).

We conducted another literature review using the search terms *cultural adaptation*, *culturally adapted therapy*, and *culture and therapy* on PsycINFO, PubMed, and Google Scholar to locate dissertations and studies that were published between 2012 and 2015.

Cultural adaptations in countries outside the United States included language translation or intervention content modifications or both. We posted requests for unpublished studies and dissertations on relevant listservs, and directly contacted authors who had previously conducted research in the field to inquire about any additional unpublished studies or works in progress. All studies included in the current meta-analysis were reported in English. Full texts of studies and dissertations were examined.

## INCLUSION AND EXCLUSION CRITERIA

One hundred thirty-six published studies from the previous meta-analyses, and from our independent search 12 additional published studies and 14 dissertations were considered for inclusion. Exclusion criteria were studies that did not include a cultural adaptation ( $N = 12$ ; e.g., studies that applied an unadapted intervention to ethnic minorities); studies without a control condition ( $N = 15$ ; e.g., pre-post design, two culturally adapted interventions without a control or nonadapted condition); studies that did not include a psychopathology outcome ( $N = 18$ ; e.g., outcome measure was well-being); and studies that did not provide adequate information to code effect sizes ( $N = 39$ ; e.g., missing means, standard deviations, or sample size per condition). We included 12 studies that provided post-intervention means but did not provide baseline means for all their outcomes (Cabiya et al., 2008; Henggeller, Melton, & Smith, 1992; Henggeller, Pickrel, & Brondino, 1999; Johnson & Breckenridge, 1982; McCabe & Yeh, 2009; Naem et al., 2011; Pan, 2011; Patel et al., 2011; Patterson et al., 2005; Perez, 2006; Rojas et al., 2007; Rowland et al., 2005). These 12 studies used random assignment to groups, so the baseline group means should have been roughly equivalent on average. A flow chart of the inclusion/exclusion process is in Figure 1.

Seventy-eight studies were included in the current meta-analysis. This includes 53% of the articles from the Benish et al. (2011) meta-analysis ( $N = 10$ ); 100% of the articles from Chowdhary et al. (2014;  $N = 16$ ); 29% of the articles from Hodge et al. (2010;  $N = 2$ ); 20% of the articles from Hodge et al. (2012;  $N = 2$ ); 50% of the articles from Huey and Polo (2008;

$N = 10$ ); 43% of the articles from Jackson et al. (2010;  $N = 3$ ); 42% of the articles from Smith and Trimble (2016;  $N = 33$ ); and 78% of the articles from van Loon et al. (2013;  $N = 7$ ). A relatively large number of studies included in this meta-analysis were also included by Smith and Trimble (2016), which is the most recent and comprehensive meta-analysis to date, but 58% of the studies in the current meta-analysis were not included by Smith and Trimble (2016).

## CODING

Two undergraduate research assistants were trained to code the studies by a graduate student who had 4 years of experience coding both qualitative and quantitative data. All studies were independently coded by at least two of the three coders. The two research assistants' initial intercoder reliability with the graduate student was 89.7%, while their initial intercoder reliability with each other was 91.9%; however, all coding was discussed and coded to consensus.

## MODERATORS

*Study Characteristics*

Study characteristics that were considered as potential moderators were: whether the study was conducted in the United States or abroad; participant age (children and adolescents up to the age of 18, adults aged 18 and over, or a combination of adults and children/adolescents); the target of intervention in child studies (parent, child/adolescent, or both); and whether the study included follow-up data. We attempted to code the acculturation status of the samples, but could not reliably do so. Only a few studies provided reasonable

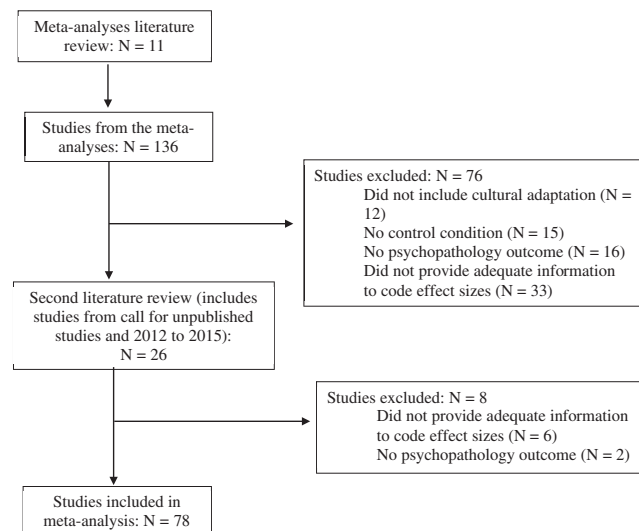


FIGURE 1 Flow Chart of the Search and Inclusion/Exclusion Process.



proxies of acculturation, such as the participants' country of birth or their primary language spoken. Even fewer studies included data from a validated measure of acculturation.

### *Study Design*

Study design variables that were considered as potential moderators were: randomization (randomized vs. quasi-experimental); treatment vs. prevention studies; and study comparison conditions. Study comparison conditions were coded as: (a) no intervention (assessment only or wait list control); (b) another type of active, nonmanualized intervention (i.e., treatment as usual that was not standardized); (c) another unadapted manualized intervention (e.g., applied muscle relaxation); or (d) a direct comparison of the nonadapted form of the culturally adapted intervention (e.g., culturally adapted CBT vs. CBT).

### *Cultural Adaptations*

The following types of cultural adaptations were coded: language of intervention (intervention conducted in English vs. another language); therapist ethnicity (attempt to ethnically match therapists and clients versus no attempt to ethnically match but non-European or non-European American therapists involved); and whether the adaptation was top-down or bottom-up based on Hwang's (2006) definitions.

### OUTCOME VARIABLES

All psychopathology-related outcome measures in each study were included, regardless of whether the outcome was directly targeted by the intervention (e.g., alcohol abuse outcomes in a depression intervention). Doing so allowed us to provide the most comprehensive analysis of the effects of the interventions and to eliminate any bias that might be involved in selecting specific outcomes (e.g., selecting outcomes that supported the hypotheses). Continuous measures (e.g., depression inventory scores) of psychopathology outcomes and remission/non-remission, which was the most common dichotomous outcome measure across studies, were included. Remission/non-remission data were reported in 16 intervention studies and were not applicable in prevention studies, in which onset of disorder was the outcome.

Behavioral measures (e.g., past month's substance use) were selected over attitudinal measures (e.g., intentions to quit substance use) because behaviors are central to the diagnostic criteria for most forms of psychopathology. Composite scores were used when a composite score and subscale scores of a measure were provided. Subscale scores were used if a composite score was not provided.

Using these inclusion criteria, within each study, effect sizes were coded for all psychopathology outcome measures.

Psychopathology outcomes were coded as: (a) mood/anxiety symptoms; (b) psychotic symptoms; (c) externalizing symptoms (e.g., substance use, impulse control); or (d) general measures of psychopathology. The first three categories were the most common psychopathology outcomes across studies.

Post-intervention data immediately following the completion of the intervention or after the same time frame of the intervention for no intervention conditions were coded for each study and were the basis of the omnibus effect size. Although the Araya et al. (2003), Ell et al. (2010), Miranda et al. (2003), and Patel et al. (2011) studies did not report all these descriptive statistics, all had depression as a post-intervention outcome and we found these data in the Chowdhary et al. (2014) meta-analysis. Any follow-up assessment data were also coded for each study.

### ANALYSIS OF EFFECT SIZES

We implemented procedures from Morris and DeShon (2002) for computing standardized mean difference (i.e., equivalent to Cohen's *d*) for meta-analyses in which effects sizes are obtained from studies that present both pre- and post-intervention data for control and treatment groups and studies that present only post-intervention data. All effect sizes and effect size variances were computed in a raw-score metric (i.e., effects were based on raw scores rather than change scores). Effect sizes were adjusted with a bias-correction function (Morris & DeShon, 2002) that corrects for a slight bias in standardized mean differences that is present when sample sizes are smaller than 20 (Hedges & Olkin, 1985). Thirteen percent of our studies had samples with 20 participants or fewer. For studies with remission outcomes, odds ratios were computed and, following recommendations from Lipsey and Wilson (2001), analyses were performed on the natural log of the odds ratio which is approximately normal unlike the odds ratio. If a study compared a culturally adapted intervention to more than one comparison group, separate effect sizes were computed for each comparison condition (e.g., culturally adapted CBT compared to medication, culturally adapted CBT compared to wait list control).

All models were fit using multilevel regression models with maximum likelihood estimation implemented using the meta3 function from the metaSEM R package (Cheung, 2015b). The random effects multilevel regression model accounts for nonindependence of effect size that is due to multiple effect sizes obtained from a single sample. The ability to consider multiple individual effect sizes is an advantage over

previous meta-analyses in which single effect sizes were considered per study or multiple effect sizes were aggregated per study, which may attenuate outlier effects. In this model, variance is decomposed into three levels: level-1 variance, which is the sampling variance ( $e_{ij}$ ), level-2 variance, which represents effect size variance within studies ( $u_{(2)ij}$ ), and level-3 variance, which represents between-study variance ( $u_{(3)ij}$ ) (Cheung, 2015a; Hox, 2010; Konstantopoulos & Hedges, 2004). In the first step of the meta-analysis, an unconditional model was fit to estimate the average effect size and the homogeneity of the unconditional effect size was evaluated using the  $Q$  statistic (Cochran, 1954), which tests the null hypotheses that effect size variance is zero. The proportion of the total effect size variance attributable to level-2 and level-3 variance was quantified with  $I^2$  (Higgins & Thompson, 2002), which is decomposed into variance at level-2 ( $I^2_{(2)}$ ) and level-3 ( $I^2_{(3)}$ ) that represent variability attributable to the use of multiple measures and between-study variability, respectively. After establishing significant heterogeneity of effect size, a series of moderator models were fit.

Follow-up examination of significant effects used model marginal means (i.e., the means predicted from the moderator regression equation) to interpret effects. We computed marginal means using the coefficients from the moderator models. Marginal means were computed for each level of the moderator. The same procedures were implemented for remission analyses conducted on the natural log of the odds ratio but marginal effects are presented as odds ratios (i.e., the exponent of the predicted value in the logged metric).

## Results

### DESCRIPTION OF STUDIES

Study characteristics are reported in Table 1. There were 13,998 participants in the 78 studies that were selected for the meta-analysis. Fifty-one percent of the participants in the studies were girls or women. Twenty-four studies were conducted in countries outside the United States. Twenty-nine percent of the participants were African American or African, 30% Asian American or Asian (e.g., India, Pakistan), 26% Latino/Hispanic American or Latino/Hispanic, 4% Native American/American Indian/First Nations Canadian, 1% Arab ancestry (e.g., Egypt, Jordan), 5% other groups of color, and 5% White/European ancestry.

Cultural adaptations of CBT were the most common intervention, utilized in nearly 30% of the studies. Thirty-six percent of the studies had a no intervention comparison condition, 35% had another active, nonmanualized intervention comparison condition, 13% had a comparison condition of

nonadapted manualized intervention different from the cultural adaptation, and 13% of the studies directly compared culturally adapted interventions to unadapted versions of the same intervention. Fifty percent of the studies conducted in the United States included therapy conducted in a non-English language. Therapist-client ethnic matching occurred in 28% of the studies. Twelve percent of the studies made no attempt at therapist-client ethnic matching, but included non-European American therapists. Five percent of the studies included only European American therapists and 26% of the studies did not specify if therapist-client ethnic matching was attempted. Five percent of the studies utilized a bottom-up adaptation.

### OVERALL EFFECT SIZE

Three hundred seven effect sizes were analyzed. Fifty-four percent of the effect sizes were for mood or anxiety symptoms, 32% were for externalizing symptoms, 2% were for psychotic symptoms, and 13% were for general psychopathology. The average effect size obtained from the unconditional model was  $g = 0.67$ , meaning that, overall, culturally adapted interventions produced better outcomes than comparison conditions.

We conducted a funnel plot analysis to assess the impact of publication bias on the results (Figure 2). A meta-analysis that does not show evidence of publication bias should have a funnel plot that is symmetrically distributed, whereas a funnel plot that is asymmetric, particularly missing data in the lower left quadrant, suggests bias. A visual inspection of the funnel plot suggests the presence of publication bias. Given the existence of publication bias, a fail-safe  $N$  (Orwin, 1983) was calculated for the overall analysis. The fail-safe  $N$  indicates the number of nonsignificant (presumably unpublished) studies that would have to be added to the analysis to nullify the results. Using the cutoff point of .10 as an overall nonsignificant finding, it would require 1,055 studies with an effect size of 0.00 to bring the current analysis to a nonsignificant level, implying that the odds that the true effect size is zero would be very low.

### MODERATOR ANALYSES

#### *Continuous Psychopathology Outcomes*

Assessment of effect size homogeneity in the unconditional model indicated that there was significant heterogeneity,  $Q(306) = 2126.2$ ,  $p < .001$ . Both the level-2 variance and level-3 variance were significantly different from zero ( $u_{(2)ij} z = 5.57$ ,  $p < .001$ , and  $u_{(3)ij} z = 4.81$ ,  $p < .001$ ), indicating that there was both variability in effect sizes within studies as well as between-study variability.

$I^2_{(2)} = .21$  and  $I^2_{(3)} = .72$ , indicating that 21% of effect size heterogeneity was attributable to the use of multiple measures and 72% of effect size heterogeneity, was due to between-study variation.

After establishing that there was significant variability in effect sizes for the continuous psychopathology measures, moderator models were fit. Moderator effect sizes are reported in Table 2. A summary of the models is displayed in Table 3. Effect sizes from treatment studies (marginal mean effect size = 0.76) were significantly larger ( $z = 2.16, p = .031, R^2 = .07$ ) than prevention studies (marginal mean effect size = 0.25). Type of psychopathology outcome was a significant moderator of the overall effect (Model  $R^2 = .04$ ). The model used studies with mood/anxiety outcomes as the reference group and contained effects for psychotic, externalizing, and general or other outcomes. Effect sizes from studies with psychotic outcomes (marginal mean effect size = 0.27) did not differ ( $z = -1.21, p = .227$ ) from studies with mood/anxiety outcomes (marginal mean effect size = 0.76). Effect sizes from studies with externalizing outcomes (marginal mean effect size = 0.59) did not differ ( $z = -1.50, p = .134$ ) from studies with mood/anxiety outcomes. Effect sizes from studies with general measures of psychopathology or other outcomes (marginal mean effect size = 0.48) were significantly smaller ( $z = -2.28, p = .023$ ) than effect sizes from studies with mood/anxiety outcomes.

#### *Dichotomous Psychopathology Outcomes*

Dichotomous psychopathology remission data (i.e., remission vs. non-remission of symptoms) were available in 16 studies, from which 26 unique effect sizes were obtained. Assessment of effect size homogeneity in the unconditional model indicated that there was significant heterogeneity ( $Q [25] = 69.5, p < .001$ ). Both the level-2 variance and level-3 variance were not significantly different from zero ( $u_{(2)ij} z = 0.57, p = .566$  and  $u_{(3)ij} z = 1.23, p = .220^1$ ), indicating that there was not significant variability in effect sizes within studies or between-study variability.  $I^2_{(2)} = .16$  and  $I^2_{(3)} = .43$ , indicating that 16% of effect size heterogeneity was attributable to the use of multiple measures and

43% of effect size heterogeneity was due to between-study variation.

Moderator effect sizes for dichotomous psychopathology measures are reported in Table 4. A summary of the models is displayed in Table 5. The beta weight in the unconditional model is 1.54 (or 4.68 as an odds ratio), which means that culturally adapted interventions had 4.68 times greater odds than other conditions to produce remission from psychopathology. The study design moderator model used studies with culturally adapted vs. no intervention control conditions as the reference group and contained effects for culturally adapted studies vs. other manualized interventions, same unadapted interventions, and other active interventions ( $R^2 = .54$ ). The largest effect size was for culturally adapted vs. no intervention control conditions (marginal OR = 9.80). Effect sizes based on culturally adapted vs. other manualized interventions (marginal OR = 3.47) were significantly ( $z = -2.15, p = .032$ ) smaller than effect sizes based on culturally adapted vs. no intervention control conditions. Effect sizes based on culturally adapted vs. same unadapted interventions (marginal OR = 3.27) did not differ significantly ( $z = -1.63, p = .104$ ) from effect sizes based on culturally adapted vs. control conditions. Effect sizes based on culturally adapted vs. other active interventions (marginal OR = 3.38) produced significantly ( $z = -2.04, p = .042$ ) smaller effect sizes than effect sizes based on culturally adapted vs. no intervention control conditions.

#### Discussion

The 78 studies reviewed in this meta-analysis are evidence that the field has attended to Forehand and Kotchick's (1996) call for the development of culturally responsive interventions, but additional development is necessary. Studies from each previous meta-analysis on cultural adaptations were represented in this meta-analysis, as well as new studies completed since the earlier meta-analyses. Our hypothesis that culturally adapted interventions would produce greater reductions in psychopathology than another intervention or no intervention was supported. The overall effect size of  $g = 0.67$  indicates that culturally adapted interventions produced substantially better outcomes than other conditions and a fail-safe statistic suggests that this finding is robust.

The effect sizes for culturally adapted interventions in this study, which ranged from .45 to .81, depending on comparison condition, are comparable to effect sizes in other meta-analyses of culturally unadapted interventions for anxiety (Hofmann et al., 2010; Siev & Chambless, 2007), mood disorders (Cuijpers et al., 2008; Hofmann et

<sup>1</sup>We fit an alternative model that did not account for study and the variance term in that model was significant ( $u_i z = 2.07, p = .038$ ). Thus, it is not the case that there is not significant variance in the effect size residual, but that effect becomes nonsignificant when accounting for variability attributable to effects nested within studies.

Table 1  
Study Characteristics

Study	Population	Culturally- adapted intervention	Comparison condition	Therapist- Client Ethnic Match?	Bottom-up adaptation
Afuwape et al. (2010)	Black adults in England	Cognitive-behavioral therapy	No intervention	Not applicable; international study	No
Araya et al. (2003)	Women in Chile	Stepped care	Another active intervention	Not applicable; international study	No
Banks et al. (1996)	African American youth	Social skills training	Same unadapted intervention	Attempt to match made	No
Banks (1998)*	African American and Latino adults	Psychosocial competence intervention	No intervention	No information given	No
Batra (2013)*	European American and Asian American	Cognitive-behavioral therapy	No intervention	Not applicable; international study	No
Beeber et al. (2010)	Latina American mothers	Interpersonal therapy	Another active intervention	No information given	No
Bella-Awusah et al. (2015)	African youth in South West Nigeria	Cognitive-behavioral therapy	Wait-list control	Not applicable; international study	No
Bolton et al. (2003)	Black adults in Uganda	Group interpersonal therapy	No intervention	Not applicable; international study	No
Bradley et al. (2006)	Vietnamese Australian adults	Group psychoeducation	Another active intervention	Not applicable; international study	No
Brody et al. (2006)	African American youth	Strong African American Families Program	Another active intervention	Attempt to match made	No
Cabiya et al. (2008)	Puerto Rican youth	Cognitive-behavioral group therapy	No intervention	Attempt to match made	No
Carter et al. (2003)	African American women	Cognitive-behavioral group therapy	No intervention	No attempt to match, but included non-white therapists	No
Damra et al. (2014)	Jordanian children	Trauma-focused cognitive-behavioral therapy	No intervention	Not applicable; international study	No
Dwight-Johnson et al. (2011)	Latino/a American adults	Cognitive-behavioral therapy	Another active intervention	Attempt to match made	No
Ell et al. (2010)	Latino/a American and European American adults	Problem-solving therapy	Another active intervention	No information given	No
Feske (2008)	African American and European American women	Prolonged exposure	Another active intervention	No attempt to match, but included non-white therapists	No
Flay et al. (2004)	African American youth	School/ community social development curriculum	Another active intervention	No information given	No
Flicker et al. (2008)	Latino/a youth	Functional family therapy	Same unadapted intervention	Attempt to match made	No
Fung (2015)*	Latino/a children	Early Pathways program	Wait-list control	No attempt to match, but included non-white therapists	No
Gallagher-Thompson et al. (2010)	Chinese American adults	Behavior management DVD	Another active intervention	No information given	No
Garza & Bratton (2005)	Latino/a American children	Child-centered play therapy	Another active intervention	Attempt to match made	No
Gater et al. (2010)	Pakistani women in England	Social group intervention	Another manualized intervention	Not applicable; international study	No
Ginsburg & Drake (2002)	African American adolescents	Cognitive-behavioral therapy	Another active intervention	No attempt to match, but included non-white therapists	No
Groditzky (1993)*	Puerto Rican and European American youth	Hero modeling	Same unadapted intervention	No information given	Yes



Grote et al. (2009)	African American, Latino American, European American, Biracial American women	Brief interpersonal therapy	Another active intervention	No information given	No
Hamdan-Mansour et al. (2009)	Arab adults in Jordan	Cognitive-behavioral therapy	No intervention	Not applicable; international study	No
Henggeler et al. (1992)	African American, European American, Latino/a American youth	Multi-systemic therapy	Another active intervention	No attempt to match, but included non-white therapists	No
Henggeler et al. (1999)	African American, European American, Asian American, Latino/a American youth	Multi-systemic therapy	Another active intervention	No attempt to match, but included non-white therapists	No
Hinton et al. (2004)	Vietnamese American adults	Cognitive-behavioral therapy	No intervention	Only white therapist	No
Hinton et al. (2005)	Cambodian American adults	Cognitive-behavioral therapy	No intervention	Only white therapist	No
Hinton et al. (2009)	Cambodian American adults	Cognitive-behavioral therapy	No intervention	Only white therapist	No
Hinton et al. (2011)	Latina American women	Cognitive-behavioral therapy	Another manualized intervention	Only white therapist	No
Hogue et al. (2002)	African American, Latino/a American youth	Multi-dimensional family prevention	No intervention	No attempt to match, but included non-white therapists	No
Huey et al. (2004)	African American, European American youth	Multi-systemic therapy	Another active intervention	No information given	No
Husain et al. (2014)	Pakistani adults	Manual-assisted problem-solving training	Another manualized intervention	Not applicable; international study	No
Imamura et al. (2014)	Japanese adults	Cognitive-behavioral therapy	Another active intervention	Not applicable; international study	No
Jackson (1997)*	African American youth	Group intervention	No intervention	No information given	No
Johnson & Breckenridge (1982)	Mexican American children	Parent education program	No intervention	No information given	No
Jones (2008)	African American women	Claiming Your Connections group intervention	No intervention	Attempt to match made	No
Jones & Warner (2011)	African American women	Claiming Your Connections group intervention	No intervention	Attempt to match made	No
Kaslow et al. (2010)	African American women	Nia psychoeducational group intervention	Another active intervention	No attempt to match, but included non-white therapists	Yes
Kataoka et al. (2003)	Latino/a American children	Cognitive-behavioral therapy group	No intervention	No information given	No
Komro et al. (2006)	African American, Latino/a American, European American youth	Home-Based Program for Alcohol Use Prevention	No intervention	No information given	No
Kopelowicz et al. (2003)	Latino/a American adults	Skills training	No intervention	Attempt to match made	No
La Fromboise & Howard-Pitney (1995)	Zuni youth	Zuni Life Skills Development curriculum	No intervention	Attempt to match made	Yes
Lau et al. (2011)	Chinese American children	Incredible Years	No intervention	Attempt to match made	No
Le et al. (2011)	Latina American mothers	Cognitive-behavioral therapy group	Another active intervention	Attempt to match made	No
Liddle et al. (2004)	Latino/a American, African American, Haitian American, Jamaican American, European American youth	Multi-dimensional family therapy	Another active intervention	No attempt to match, but included non-white therapists	No

(continued on next page)

Table 1 (continued)

Study	Population	Culturally- adapted intervention	Comparison condition	Therapist- Client Ethnic Match?	Bottom-up adaptation
Margolis (2013)*	Spanish youth and parents	Family-centered, evidence-based program	Wait-list control	Not applicable; international study	No
Martinez & Eddy (2005)	Latino/a American youth	Parent Management Training	No intervention	No information given	No
Matos et al. (2009)	Puerto Rican children	Parent-Child Interaction Therapy	No intervention	Attempt to match made	No
Mausbach et al. (2008)	Latino/a American adults	Skills training	Same unadapted intervention/ another active intervention	Attempt to match made	No
McCabe & Yeh (2009)	Mexican American children	Parent Child Interaction Therapy	Same unadapted intervention/ another active intervention	Attempt to match made	No
Meffert et al. (2014)	Sudanese adults	Interpersonal psychotherapy	Wait-list control	Not applicable; international study	No
Mejia et al. (2015)	Latino/a parents in Panama City	Triple P Positive Parenting Program	No intervention	Not applicable; international study	No
Miller et al. (2011)	Aboriginal Canadian, European Canadian children	School-based cognitive-behavioral therapy	No intervention	Not applicable; international study	No
Miranda et al. (2003)	Latino/a American, African American, European American adults	Cognitive-behavioral therapy	Same unadapted intervention	Attempt to match made	No
Naeem et al. (2011)	Pakistani adults	Cognitive-behavioral therapy	Another manualized intervention	Not applicable; international study	No
Naeem et al. (2014)	Pakistani adults	Cognitive-behavioral therapy	Another manualized intervention	Not applicable; international study	No
Pan et al. (2011)	East Asian American adults	Exposure therapy	Same unadapted intervention/ another manualized intervention	No information given	No
Pan (2011)	Asian and European American adults	Directive intervention	Same unadapted intervention	Attempt to match made	No
Patel et al. (2003)	Asian Indian adults	Behavior therapy	Another manualized intervention/ another active intervention	Not applicable; international study	No

Patel et al. (2011)	Asian Indian adults	Collaborative stepped care	Another active intervention	Not applicable; international study	No
Patterson et al. (2005)	Latino/a American adults	Cognitive-behavioral therapy	Another active intervention	Attempt to match made	No
Perez (2006)*	Mexican descent adults	Video feedback	Same unadapted intervention	No information given	No
Rahman et al. (2008)	Pakistani women Adults	Cognitive-behavioral therapy	Another active intervention	Not applicable; international study	No
Ramirez et al. (2009)	Mexican American children	Cuento therapy	No intervention	Attempt to match made	Yes
Rojas et al. (2007)	Chilean mothers	Psychoeducational group	Another manualized intervention	Not applicable; international study	No
Rossello & Bernal (1999)	Puerto Rican Youth	Interpersonal therapy	Another manualized intervention/ No intervention	No information given	No
Rowland et al. (2005)	Native Hawaiian Youth	Multisystemic therapy	Another active intervention	Attempt to match made	No
Santisteban et al. (2003)	Latino/a youth	Brief Strategic Family Therapy	Another active intervention	Attempt to match made	No
Santisteban et al. (2011)	Hispanic youth	Family-based intervention	Another manualized intervention	No information given	No
Shin & Lukens (2002)	Korean American adults	Psychoeducational group + supportive therapy	Another active intervention	Attempt to match made	No
Silverman et al. (1999)	Latino/a American, European American children	Cognitive-behavioral therapy group	No intervention	No information given	No
Villarreal (2008)*	Hispanic parents	Child-Parent relationship therapy	Wait-list control	No information given	No
Wong (2008)	Chinese adults	Cognitive-behavioral therapy	No intervention	Not applicable; international study	No
Yoo et al. (2014)	Korean youths	Program for the Education and Enrichment of Relational Skills	Wait-list control	Not applicable; international study	No
Zhang (2013)*	African American women	Mindfulness-based intervention	Another manualized intervention	No information given	No

\*Dissertation.

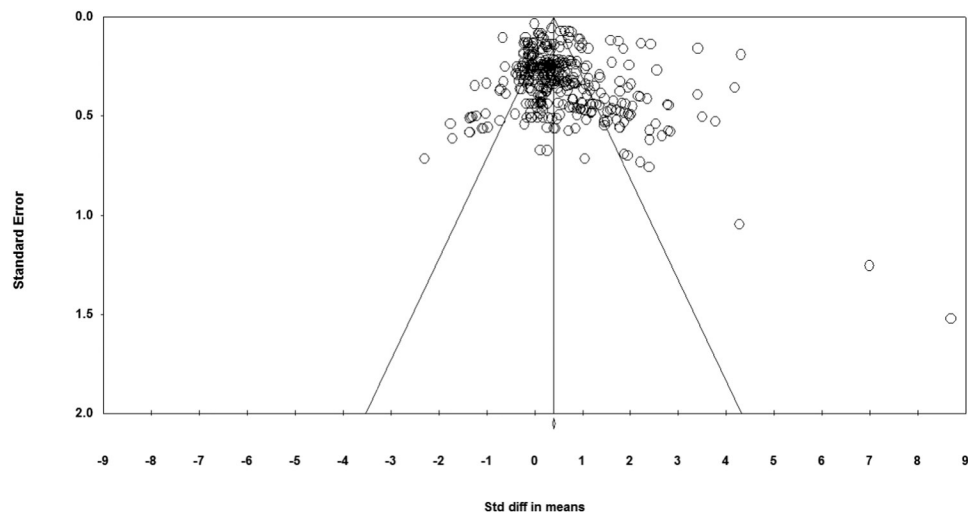


FIGURE 2 Funnel Plot of Standard Error by Standard Differences in Means.

al., 2010), psychosis (Turner et al., 2014), and substance use (Dutra et al., 2008). Unfortunately, the ethnic composition of the samples in these

meta-analyses was not reported and there are differences in terms of the populations, measures, methods, and interventions between the studies in

Table 2  
Moderator Effect Sizes

Model	Moderator value	Marginal mean (95%CI)
International	Domestic ( $N=55$ )	0.63 (0.42,0.85)
	International ( $N=23$ )	0.76 (0.43,1.09)
Age group	Child/adolescent ( $N=32$ )	0.57 (0.29,0.84)
	Adult ( $N=40$ )	0.79 (0.54,1.03)
	Mixed ( $N=6$ )	0.47 (-0.18,1.12)
Parent-Child	Adults ( $N= 40$ )	0.79 (0.54,1.03)
	Parent ( $N=8$ )	0.50 (-0.04,1.04)
	Child ( $N=28$ )	0.57 (0.27,0.86)
	Parent and Child ( $N=2$ )	0.61 (-0.48,1.69)
Follow-up	No follow-up ( $N=51$ )	0.61 (0.39,0.82)
	Follow-up ( $N=27$ )	0.78 (0.50,1.05)
Randomized	Quasi-experimental ( $N=4$ )	0.58 (-0.20,1.36)
	Randomized ( $N=74$ )	0.67 (0.49,0.86)
Study Design	No intervention control ( $N=34$ )	0.81 (0.56,1.05)
	Other manualized interventions ( $N=10$ )	0.45 (0.01,0.90)
	Same unadapted intervention ( $N=9$ )	0.52 (0.15,0.90)
	Other active intervention ( $N=25$ )	0.60 (0.32,0.89)
Treatment	Prevention ( $N=14$ )	0.25 (-0.17,0.67)
	Treatment ( $N=64$ )	0.76 (0.56,0.95)
Client-therapist ethnic match <sup>1</sup>	Not-matched, non-European American therapists ( $N=9$ )	0.65 (0.26,1.05)
	Matched ( $N=22$ )	0.63 (0.38,0.88)
Top-Down	Bottom-up ( $N=4$ )	0.34 (-0.42,1.10)
	Top-down ( $N=74$ )	0.69 (0.50,0.87)
Psychopathology Outcome	Mood/anxiety ( $N=57$ )	0.76 (0.57,0.96)
	Psychotic ( $N=4$ )	0.27 (-0.51,1.05)
	Addiction ( $N=30$ )	0.59 (0.36,0.83)
	General or Other ( $N=19$ )	0.48 (0.21,0.75)

<sup>1</sup> Only included domestic studies.



Table 3  
Model Summaries for the Average Effect Size and Each Individual Moderator Model

Model	Parameter	<i>B</i>	<i>SE</i>	<i>z</i>	<i>p</i>
Average Effect Size	Intercept	0.670	0.092	7.293	<.001
	$u_{(2)ij}$	0.157	0.028	5.570	<.001
	$u_{(3)ij}$	0.535	0.111	4.811	<.001
International	Intercept	0.633	0.109	5.799	<.001
	International	0.123	0.201	0.611	.541
	$u_{(2)ij}$	0.157	0.028	5.570	<.001
Age group (reference = child/adolescent)	$u_{(3)ij}$	0.534	0.111	4.820	<.001
	Intercept	0.566	0.139	4.066	<.001
	Adult	0.220	0.189	1.165	.244
Parent-Child (reference =adult)	Mixed	-0.094	0.360	-0.262	.793
	$u_{(2)ij}$	0.158	0.028	5.567	<.001
	$u_{(3)ij}$	0.514	0.109	4.725	<.001
Follow-up	Intercept	0.785	0.127	6.170	<.001
	Parent	-0.285	0.305	-0.934	.351
	Child	-0.223	0.197	-1.134	.257
Parent and Child	Parent and Child	-0.177	0.568	-0.311	.756
	$u_{(2)ij}$	0.157	0.028	5.567	<.001
	$u_{(3)ij}$	0.514	0.109	4.723	<.001
Randomized	Intercept	0.606	0.110	5.496	<.001
	Follow-up	0.171	0.168	1.017	.309
	$u_{(2)ij}$	0.158	0.028	5.582	<.001
Study Design (reference = no intervention controls)	$u_{(3)ij}$	0.519	0.109	4.776	<.001
	Intercept	0.580	0.398	1.456	.145
	Randomized	0.095	0.409	0.232	.816
Treatment/prevention	$u_{(2)ij}$	0.157	0.028	5.570	<.001
	$u_{(3)ij}$	0.535	0.111	4.812	<.001
	Intercept	0.806	0.124	6.506	<.001
Client-therapist ethnic match <sup>1</sup>	Other manualized intervention	-0.351	0.244	-1.439	.150
	Same unadapted intervention	-0.283	0.211	-1.342	.180
	Other active intervention	-0.204	0.187	-1.091	.275
Top-Down	$u_{(2)ij}$	0.157	0.028	5.540	<.001
	$u_{(3)ij}$	0.504	0.108	4.674	<.001
	Intercept	0.249	0.214	1.160	.246
Psychopathology Outcome (reference = mood/anxiety)	Treatment	0.509	0.236	2.157	.031
	$u_{(2)ij}$	0.156	0.028	5.571	<.001
	$u_{(3)ij}$	0.500	0.105	4.772	<.001
Client-therapist ethnic match <sup>1</sup>	Intercept	0.652	0.201	3.237	.001
	Client-therapist ethnic match	-0.021	0.239	-0.089	.929
	$u_{(2)ij}$	0.094	0.034	2.753	.006
Top-Down	$u_{(3)ij}$	0.278	0.094	2.963	.003
	Intercept	0.342	0.388	0.882	.378
	Top-Down	0.346	0.399	0.867	.386
Psychopathology Outcome (reference = mood/anxiety)	$u_{(2)ij}$	0.157	0.028	5.570	<.001
	$u_{(3)ij}$	0.528	0.110	4.794	<.001
	Intercept	0.764	0.099	7.676	<.001
Psychopathology Outcome (reference = mood/anxiety)	Psychotic	-0.491	0.407	-1.207	.227
	Externalizing	-0.170	0.113	-1.499	.134
	General or Other	-0.286	0.125	-2.281	.023
Psychopathology Outcome (reference = mood/anxiety)	$u_{(2)ij}$	0.151	0.028	5.411	<.001
	$u_{(3)ij}$	0.512	0.108	4.729	<.001

Note. Model intercepts represent the average effect size at the model's intercept (i.e., the point where all independent variables are zero), moderator parameters (e.g., language of intervention) represents the change per unit, and  $u_{(2)ij}$  represents effect size variability and  $u_{(3)ij}$  represents between-study variability.

<sup>1</sup> Only included domestic studies.

Table 4  
Moderator Effect Sizes (in odds ratio metric)

Model	Moderator value	Marginal OR (95%CI)
International	Domestic ( $N=11$ )	4.66 (2.61,8.31)
	International ( $N=5$ )	4.73 (2.34,9.53)
Age group	Child/adolescent ( $N=6$ )	6.34 (2.95,13.64)
	Adult ( $N=10$ )	4.05 (2.40,6.81)
Parent-Child	Adults ( $N=10$ )	4.03 (2.43,6.65)
	Parent ( $N=1$ )	13.25 (2.69,65.25)
	Child ( $N=5$ )	5.15 (2.21,12.02)
Follow-up	No follow-up ( $N=9$ )	5.74 (3.35,9.81)
	Follow-up ( $N=7$ )	3.39 (1.73,6.65)
Study Design	No intervention control ( $N=5$ )	9.80 (4.83,19.88)
	Other manualized intervention ( $N=3$ )	3.47 (1.82,6.61)
	Same unadapted intervention ( $N=1$ )	3.27 (1.04,10.24)
	Other active intervention ( $N=7$ )	3.38 (1.59,7.15)
Language (English v. non- English)	English ( $N=5$ )	3.99 (1.88,8.48)
	Non-English in U.S. ( $N=6$ )	5.35 (1.53,18.66)
Client-therapist ethnic match <sup>1</sup>	Not-matched, non- European	
	American therapists ( $N=2$ )	7.22 (2.02,25.73)
	Matched ( $N=4$ )	4.32 (2.22,8.43)
Psychopathology Outcome	Mood/anxiety ( $N=11$ )	4.10 (2.46,6.82)
	Psychotic ( $N=1$ )	4.14 (0.58,29.65)
	Addiction ( $N=4$ )	6.98 (2.90,16.77)

<sup>1</sup> Only included domestic studies.

these meta-analyses and those in the current one. Nevertheless, cultural adaptations in the current meta-analysis with a sample that was 95% people of color produced results on par with the general literature on interventions for psychopathology.

Nearly all the studies in the current meta-analysis involved top-down cultural adaptations of an existing unadapted treatment developed for other groups, which is probably why the effect sizes in this meta-analysis are comparable to the other meta-analyses of culturally unadapted interventions. However, bottom-up interventions are the most responsive to cultural context and culture-specific concerns about psychopathology, yet only four studies in the current meta-analysis involved bottom-up interventions. The effect size difference between top-down and bottom-up studies was not significant, but the effect size of bottom-up interventions was small and not statistically significant. There are too few studies for conclusions about the effects of bottom-up studies.

A related issue is that very few of the studies in the current meta-analysis included bottom-up culture-specific psychopathology outcome measures, which might be expected to be the most sensitive to the effects of culturally adapted

interventions. Cardemil (2015) recently contended that the universalist conception of mental disorders is limited, that evidence has been established that the prevalence of disorders varies across cultural groups, and that the expression of distress and symptom presentation is culture-specific in many instances. For example, prevalence rates of depression may differ because persons of Chinese ancestry express depression via somatic symptoms. These somatic symptoms are not well captured in standard depression inventories (e.g., Beck Depression Inventory) developed with and normed on predominantly European-Americans, who tend to express more affective symptoms of depression (Ryder et al., 2008). The current results are primarily based on standard measures of psychopathology, which do not capture culture-specificity (Sue, Cheng, Saad, & Chu, 2012). The only studies in the current meta-analysis to include culture-specific measures of psychopathology were by Hinton and colleagues (Hinton et al., 2004, 2005, 2009, 2011) in samples of Cambodian refugees (neck-induced panic, orthostatic panic) and Latino/as (*nervios*, *ataque de nervios*). The large effects in the Hinton et al. studies suggest the sensitivity of these measures to culturally adapted interventions, but these effects may have been partially attributable to the therapist's cultural

Table 5  
Model Summaries for the Average Effect Size and Each Individual Moderator Model

Model	Parameter	<i>B</i>	<i>SE</i>	<i>z</i>	<i>p</i>
Average Effect Size	Intercept	1.544	0.228	6.774	<.001
	$u_{(2)ij}$	0.137	0.239	0.575	.565
	$u_{(3)ij}$	0.369	0.301	1.227	.220
International	Intercept	1.539	0.295	5.209	<.001
	International	0.014	0.464	0.030	.976
	$u_{(2)ij}$	0.137	0.238	0.574	.566
Age group (reference = child/adolescent)	$u_{(3)ij}$	0.368	0.301	1.224	.221
	Intercept	1.847	0.391	4.726	<.001
	Adult	-0.449	0.472	-0.951	.342
	$u_{(2)ij}$	0.144	0.249	0.577	.564
	$u_{(3)ij}$	0.322	0.292	1.103	.270
	Intercept	1.393	0.256	5.429	<.001
Parent-Child (reference = adult)	Parent	1.191	0.853	1.396	.163
	Child	0.247	0.501	0.494	.622
	$u_{(2)ij}$	0.193	0.317	0.608	.543
	$u_{(3)ij}$	0.247	0.320	0.769	.442
	Intercept	1.747	0.274	6.377	<.001
	Follow-up	-0.526	0.448	-1.175	.240
Follow-up	$u_{(2)ij}$	0.201	0.339	0.594	.553
	$u_{(3)ij}$	0.215	0.372	0.576	.564
	Intercept	2.283	0.361	6.326	<.001
Study Design (reference = nointervention controls)	Other manualized intervention	-1.038	0.483	-2.148	.032
	Same unadapted intervention	-1.099	0.675	-1.627	.104
	Other active intervention	-1.066	0.523	-2.038	.042
	$u_{(2)ij}$	0.143	0.237	0.605	.545
	$u_{(3)ij}$	0.171	0.210	0.815	.415
	Intercept	1.384	0.384	3.602	<.001
Language (English v. non-English)	Non-English	0.292	0.858	0.341	.733
	$u_{(2)ij}$	0.386	1.100	0.351	.726
	$u_{(3)ij}$	0.000	0.959	0.000	1.00
Client-therapist ethnic match <sup>1</sup>	Intercept	1.976	0.649	3.047	.002
	Client-therapist ethnic match	-0.513	0.789	-0.650	.516
	$u_{(2)ij}$	0.000	0.759	0.000	1.00
	$u_{(3)ij}$	0.063	0.299	0.210	.834
	Intercept	1.411	0.260	5.432	<.001
	Psychotic	0.009	1.038	0.008	.993
Psychopathology Outcome (reference = mood/anxiety)	Addiction	0.531	0.517	1.028	.304
	$u_{(2)ij}$	0.141	0.245	0.575	.565
	$u_{(3)ij}$	0.319	0.288	1.107	.268

Note. Model intercepts represent the average effect size at the model's intercept (i.e., the point where all independent variables are zero), moderator parameters (e.g., language of intervention) represents the change per unit, and  $u_{(2)ij}$  represents effect size variability and  $u_{(3)ij}$  represents between-study variability.

<sup>1</sup> Only included domestic studies.

competence (e.g., multilingual, multicultural expertise; the same therapist was the sole therapist in all four studies) and the no intervention control design in these studies. Thus, it is unknown if existing interventions, both those that are culturally adapted and unadapted, are effective in addressing culture-specific patterns of psychopathology that may be of vital importance in the contexts in which

they occur (A. Fingerhut, personal communication, February 2016).

There were several moderators of the overall effect size in the current results. Consistent with our study design moderation hypothesis, in the remission studies a manualized intervention or another active, non-manualized intervention as a comparison condition produced smaller effects than study designs in which

the comparison condition was no intervention. This finding that more stringent study designs resulted in smaller effects is consistent with the results of a previous meta-analysis (Benish et al., 2011). Nevertheless, in the current results the odds ratios for the studies with more stringent designs were above three in the remission studies and in the studies of continuous psychopathology outcomes the effect sizes for more stringent designs were medium, which indicates the greater effectiveness of culturally adapted interventions. Moreover, in the studies with continuous psychopathology outcomes, there was a medium effect size favoring culturally adapted interventions over unadapted versions of the same intervention and the effects in studies with this comparison design did not significantly differ from the effects in studies with a no intervention comparison. However, this direct evidence of incremental effects of cultural adaptations over unadapted versions of the same intervention is based on only nine studies.

In support of our prevention moderation hypothesis, effect sizes were significantly larger in treatment studies than in prevention studies. The relatively restricted range of psychopathology in prevention studies limits the ability to demonstrate the superiority of culturally adapted interventions over unadapted interventions, which may leave prevention science critics unconvinced that the benefits of cultural adaptation outweigh its costs (Elliott & Mihalic, 2004). Moreover, the effects of culturally adapted interventions on psychopathology are likely to have been underestimated in previous meta-analyses that did not disaggregate treatment and prevention effects.

Another significant moderator was type of psychopathology outcome with larger effects in studies of depression or anxiety vs. studies with general psychopathology outcomes. Most interventions target specific outcomes (e.g., depression, anxiety) and may have less of an impact on more general forms of psychopathology. Nevertheless, the overall effect size in studies with general psychopathology outcomes was medium, which indicates the effectiveness of culturally adapted interventions.

The failure to replicate other moderator effects found in previous meta-analyses is likely a combination of the different sets of studies sampled and the relatively small effects of moderators in previous meta-analyses. Some of the notable variables that did not significantly moderate the overall effect size in the current meta-analysis included whether the therapy was conducted in a non-English language and international studies vs. studies in the United States. These findings suggest that evidence-based interventions can be effectively delivered in non-English languages. However, this general finding does not imply that the language translation process is

uncomplicated. For example, in a recent review of culturally adapted interventions for depression, Kalibatseva and Leong (2014) concluded that simple translations are inadequate to make an intervention culturally responsive. A literal translation of an intervention manual may not have the same meaning in another language as it does in English (Kagawa-Singer, Dressler, George, & Ellwood, 2015). Adequate translation involves a process of both translation and back translation (Alegria et al., 2004). Even when the same term exists across cultural contexts (e.g., “good patient”), its meaning is not necessarily equivalent (Kagawa-Singer et al., 2015). Moreover, some concepts cannot be literally translated, and may not be equally valued and desired from one cultural context to another. For example, there is no Chinese term for “assertiveness,” which is typically a component of cognitive-behavioral interventions.

Another notable variable that did not significantly moderate the overall effect was therapist-client ethnic matching, for which there have been mixed results in past meta-analyses. Studies that included therapists of color yielded medium effect sizes when there was deliberate ethnic matching between therapists and clients as well as when there was not. Therapist ethnicity may be particularly salient in the initial stages of therapy and therapist-client ethnic matching may prevent premature termination in some cases (Ibaraki & Hall, 2014). However, the importance of therapist-client ethnic matching may subside in importance as a client begins to fully understand the deep components of psychotherapy, such as therapeutic alliance.

Several other methodological variables we analyzed did not moderate the overall effect of culturally adapted interventions. These included no follow-up vs. follow-up assessment and randomized vs. quasi-experimental design. This lack of moderation suggests that the effects of culturally adapted interventions are robust across the levels of these variables.

A strength of this meta-analysis was the use of the random effects multilevel regression model which accounts for nonindependence of effect size due to multiple effect sizes obtained from a single sample. This model allows for consideration of multiple effect sizes per study without violating assumptions of independence and provides a more comprehensive picture of the effects of interventions than reliance on single or aggregated measures. A second strength of this meta-analysis was controlling for pre-intervention psychopathology, which has not been implemented in previous meta-analyses of culturally adapted interventions. In addition, the use of all psychopathology outcome measures in studies eliminated potential biases involved in selecting outcomes for analyses.



It is also important to consider the limitations of this study when interpreting the findings. The focus of this meta-analysis is on psychopathology as the outcome. Over 60% of the studies involved mood or anxiety symptoms and 29% involved externalizing symptoms. The effectiveness of culturally adapted interventions with symptoms other than these is unknown, as there were few studies of other symptoms. Moreover, not all levels of all moderators were well populated (e.g., interventions that were adapted using a bottom-up process), which limited sensitivity to detecting effects of those moderators. There were only 16 studies that reported remission outcomes, which is only one-fifth of the studies in the overall analyses. Thus, the results of the analyses of continuous psychopathology outcomes are likely more reliable than the remission outcome results. We also did not focus on positive outcomes, such as coping skills and well-being, because there are relatively few studies of the effects of culturally adapted intervention in this area. Although reduction of psychopathology is critical, building and enhancing prosocial behavior is also an important aspect of psychological health.

### Conclusions

Forehand and Kotchick (1996) recommended that cultural adaptations of interventions follow the identification of cultural contexts of behaviors and the development of constructs relevant to these cultural contexts. The development of cultural adaptations of interventions has far outpaced the identification of cultural contexts and the measurement of relevant cultural constructs. The cultural adaptations movement has proceeded largely independently of efforts to conceptualize and measure culture-specific psychopathology.

Most of the studies in this meta-analysis were top-down, in which fidelity was emphasized, sometimes more than cultural fit. However, an insistence on fidelity without flexibility can perpetuate health disparities by impeding the development of effective interventions for people of color (N. Zane, personal communication, May, 2015). On the other end of the fidelity-fit spectrum, there were very few bottom-up cultural adaptation studies. Moreover, cultural adaptations might be expected to most strongly impact culture-specific forms of psychopathology, yet there were very few studies that included culture-specific psychopathology outcomes.

These gaps in the literature suggest directions for future research:

1. It is crucial to identify and measure community-specific cultural contexts of risk and resilience that influence disorders because this compo-

ment of cultural adaptation has been largely neglected. These risk and resilience contexts should guide efforts to design and evaluate culturally adapted interventions (Forehand & Kotchick, 1996; Lau, 2006).

2. The effects of top-down cultural adaptations on both mainstream and culture-specific psychopathology outcomes need to be further evaluated in comparisons of culturally adapted vs. unadapted forms of the same intervention. Incremental effects of culturally adapted interventions were identified in this meta-analysis but there were only nine studies using the culturally adapted vs. unadapted forms of the same intervention design. An adequate evaluation of cultural adaptations should focus on substantive modifications that are likely to produce differences (e.g., cultural content and values) rather than on relatively minor variations (e.g., therapist-client ethnic match, language translation) that are not.
3. The effects of bottom-up interventions vs. evidence-based interventions on both mainstream and culture-specific psychopathology outcomes need to be evaluated. Bottom-up interventions may already exist in community settings but have not been evaluated. Rather than reinvent the wheel, researchers should increase partnerships with community mental health organizations to empirically evaluate community-specific, bottom-up approaches.
4. Careful examination of potential moderators of intervention effects associated with therapists (e.g., cultural competence) and clients (e.g., racial/ethnic identity) is needed (cf. Tao, Owen, Pace, & Imel, 2015). It is likely that therapist and client personal characteristics account for moderation of intervention effects more than surface variables, such as therapist ethnicity or language in which the intervention is conducted.
5. Ethnic/race-related disparities in mental health service utilization have been well-documented and persistent (López, Barrio, Kopelowicz, & Vega, 2012; Snowden, 2012; Sue et al., 2012). Research on how cultural adaptations affect participant engagement in interventions is necessary.

A recent National Institutes of Health report concludes that culture informs all behavior (Kagawa-Singer et al., 2015). The cultures that inform behavior are becoming increasingly non-European American, as 38% of the United States population is non-European American and a majority of United States children under 5 years of

age is non-European American (U.S. Census Bureau, 2014). Forehand and Kotchick (1996) were prescient when they called for conceptualizations, measurements, and interventions to become more culturally competent. The field has partially responded to Forehand and Kotchick's wake-up call and needs to continue to devote attention and resources to the rigorous development of culture-specific conceptualization and measurement of psychopathology, and culturally responsive interventions.

#### Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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