

Running head: ETHNIC DIFFERENCES IN DEPRESSION OUTCOMES

ADOLESCENT DEPRESSION PREVENTION: ETHNIC DIFFERENCES IN

DEPRESSION OUTCOMES

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Abstract

Depression prevention programs have small to moderate effects, with larger effects for selective and indicated programs. While there is growing interest in examining whether demographic variables moderate outcomes, few studies have examined ethnicity as a moderator. Interpersonal Psychotherapy-Adolescent Skills Training (IPT-AST) is an effective depression prevention program. The current study compared IPT-AST's efficacy to that of group counseling (GC) for White ($n = 71$), Latino ($n = 71$), and Black ($n = 26$) adolescents with elevated depressive symptomatology. The study examined ethnic differences in initial symptom levels, and patterns of recovery, measured by scores on the Center for Epidemiological Studies Depression Scale (CES-D). There were no significant differences in mean depression scores across ethnicities at screening or baseline. From baseline to post-intervention, intervention condition did not have a significant main effect, nor was there a significant interaction of intervention condition and ethnicity on CES-D scores. However, CES-D scores varied significantly as a function of ethnicity from mid- to post-group ($F = 6.20, p < .01, \eta^2 = .07$), regardless of intervention condition. Post-hoc analyses examined the effect of ethnicity and found that at mid-group, Latino participants' mean CES-D score was significantly higher than that of White participants. At post-group, Latino and Black participants had mean CES-D scores that were significantly higher than White participants. Thus, there was preliminary evidence that depression prevention programs may be less effective for minority youth, in particular in the GC condition. Additional research is needed on the effects of prevention programs for different ethnic groups.

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Introduction

Depression is among the most commonly diagnosed mental illnesses in adolescents. In fact, it is so common that at any given moment, 3-8% of teenagers meet criteria for a depressive disorder (Merry, McDowell, Hetrick, Bir & Muller, 2004; Sawyer et al., 2010) and an estimated 28% of individuals will experience a depressive episode over the course of adolescence (Lewinsohn, Rohde & Seeley, 1998). Furthermore, experiencing one depressive episode places individuals at heightened risk for subsequent episodes (Costello, Mustillo, Erkanli, Keeler & Angold, 2003; Kessler, Avenevoli & Ries Merikangas, 2001; Lewinsohn, Rohde, Klein & Seeley, 1999). The effects of adolescent depression can be seen in poorer functioning across a variety of domains, such as school, peer interactions, and family relationships (Kessler et al., 2001; Merry et al., 2004). Additionally, depression is highly correlated with anxiety disorders, substance abuse, and externalizing disorders (Kessler et al., 2001).

Perhaps as a result of the aforementioned findings, there is a growing interest in preventing the initial development of depression and other mental health problems (e.g., President's New Freedom Commission on Mental Health, 2003; Weist & Paternite, 2006), as doing so would decrease the amount of impairment and disability caused by mental illness (Horowitz & Garber, 2006). Given that the onset for depression is most common in adolescence (Hankin, Abramson, Moffitt, Silva, McGee & Angell, 1998; Kessler et al., 2001; Newman, Moffitt, Caspi, Magdol, Silva & Stanton, 1996), many programs have been developed targeting late childhood and early adolescence. Considering that schools are the main providers of mental health services for children (Burns et al., 1995; Hoagwood & Erwin, 1997), there has also been an effort to adapt

some of these programs for use within the schools. Providing prevention programs in schools has several advantages (President's New Freedom Commission on Mental Health, 2003), including the ability to provide help to students who might not otherwise receive services due to their parents' unwillingness or inability to seek or pay for their treatment (Hoagwood & Olin, 2002). Given the impairments associated with depression and the fact that many depressed youth do not receive mental health services until they reach adulthood (Kessler et al., 2001), there is a clear need for depression prevention programs, particularly ones that can be delivered in schools.

There are three types of prevention programs: universal, selective, and indicated (Gordon, 1983). Universal programs are those that are aimed at decreasing the undesirable outcome in every member of the population, regardless of their risk. Selective programs are those that focus on preventing disorders in individuals at a heightened risk for developing them, for instance youth who are at risk for depression because they have a parent who has been depressed. Finally, indicated programs focus on preventing the worsening of the symptoms in people already symptomatic of a disease but not fulfilling the criteria required to be diagnosed.

To date, a number of depression prevention programs have been developed and tested. These programs have largely been based on cognitive-behavioral models and have varied in their target population (i.e., whether they have been universal, selective, or indicated). Meta-analyses suggest that these depression prevention programs have small to moderate effects, with larger effects demonstrated for selective and indicated programs. For instance, Horowitz and Garber (2006) examined the effects of 30 depression prevention programs. Selective prevention programs ($r = .30$) had a

significantly larger mean effect size than universal prevention programs ($r = .12$) at post-intervention. Although, at post-intervention, indicated programs ($r = .23$) did not produce outcomes that were significantly greater than those of universal programs, they trended towards such a pattern. At the follow-up, both selective ($r = .34$) and indicated programs ($r = .31$) had larger mean effect sizes than universal programs ($r = .02$). In 2009, Stice, Shaw, Bohon, Marti and Rohde published another depression prevention meta-analysis. Similar to Horowitz and Garber's findings, overall effect sizes were small; indicated and selective prevention programs had larger effect sizes than universal programs both at posttest ($r = .23$) and at follow-up ($r = .14$). Based on these meta-analyses, it appears that, as a whole, depression prevention programs have small effects, with programs focused on participants at higher levels of risk or symptomatology producing larger and more sustained effects.

An important question for the depression prevention field is whether the effects of these interventions vary as a function of different youth characteristics, such as gender, age or ethnicity. This has implications for the generalizability of study findings and also for deciding which program may be more or less effective for a given individual. Recent meta-analytic studies of depression prevention interventions (e.g., Horowitz & Garber, 2006; Stice et al., 2009) have examined demographic factors such as age and gender as potential moderators of outcomes. Findings were mixed; Stice et al. (2009) found that older participant age and samples with higher percentages of female participants were both associated with larger effect sizes. While Horowitz and Garber (2006) initially had similar findings to those of Stice et al. (2009), upon removing two studies that had been conducted on college-aged students from their sample, the effects of age and gender were

no longer significant. The disappearance of moderating effects may partially be explained by the restricted range of ages in the remaining studies and the reduction in power associated with removing two out of the thirty studies.

Fewer studies have analyzed whether the effects of programs vary based upon minority or non-minority status. This is particularly concerning given evidence which suggests that minority youth may be at a heightened risk for developing depression (Plant & Sachs-Ericsson, 2004), coupled with the fact that these groups may also be less likely to access treatment for mental illness (Cuffe, Waller, Cuccaro, Pumariega & Garrison, 1995; Cummings & Druss, 2011). The lack of studies regarding the potentially moderating effect of ethnicity upon outcomes following depression prevention programs may result in a misrepresentation of the utility of these programs for ethnic minority populations. Only one meta-analysis has examined ethnicity as it relates to participants' outcomes following the intervention. Specifically, Stice et al. (2009) examined whether ethnicity of participants moderated intervention outcomes. "Ethnicity" for each sample was quantified by determining the percentage of White and non-White participants. Utilizing tertile splits, the authors found moderate post-intervention effect sizes for studies with less than 55% White participants ($r = .24$) and those with between 55 and 83% White participants ($r = .25$), whereas in samples comprised of more than 83% of White participants, effect sizes were not significant ($r = .04$). This suggests that depression prevention programs may be particularly effective for ethnic minorities.

Some individual studies have had a large enough percentage of minority participants to examine whether race or ethnicity moderates intervention outcome, although not all have examined this important moderator (e.g., Stice, Burton, Bearman &

Rohde, 2007). Of those that did, the findings were mixed. For example Cardemil, Reivich, Beevers, Seligman, and James (2007) compared the effects of the Penn Resiliency Program (PRP), a school-based cognitive-behavioral universal prevention program that teaches children problem-solving skills, that was tailored for low socioeconomic status and minority groups, to a no-intervention control group. With their sample of 168 African American and Latino children, researchers found that the program was effective in decreasing depressive symptomatology at post-group ($p < 0.01$, $r = 0.12$), one-year ($p < 0.01$, $r = .31$) and two-year follow-up for the 53 Latino children in the study ($p < 0.01$, $r = .29$). However, there were no significant differences for the 115 African American participants who were randomly assigned to the PRP group and the no-intervention control group. This was due to the fact that both the African American children who participated in the PRP group and those who did not receive an intervention showed a similar statistically significant decline in symptomatology.

Other studies did not find that results differed as a function of ethnicity (e.g., Bearman, Stice & Chase, 2003). Most recently, Marchand, Ng, Rohde and Stice (2010) combined data from two efficacy studies of their indicated cognitive-behavioral prevention program to examine whether intervention effects differed by race or ethnicity. Although the larger studies included a number of different intervention arms, the focus of this paper was on the differences between the cognitive-behavioral prevention group and an assessment-only control group. The samples from these two studies consisted of European Americans, Latinos, Asian Americans, African Americans and those who identified as more than one ethnicity. Across both studies, there were enough European American and Latinos to have sufficient power so that medium or large effect sizes could

be detected. Utilizing a multivariate Analysis of Variance (ANOVA), the authors found that while there was a significant reduction in depressive symptoms for participants in the intervention group compared to the control ($p < .01$), this effect did not differ for Latinos or European participants. Their findings suggest that indicated cognitive-behavioral depression prevention programming may be equally effective in reducing depressive symptomatology in both minority and non-minority participants.

While the majority of prevention programs that have been developed are cognitive-behavioral programs, another depression prevention program that has received empirical support is Interpersonal Psychotherapy-Adolescent Skills Training (IPT-AST) (Young, Mufson & Davies, 2006). IPT-AST is an adaptation of Interpersonal Psychotherapy for Depressed Adolescents (IPT-A). IPT-A is an intervention that has been shown to be effective in treating depression, in largely Hispanic populations in the United States (Mufson, Weissman, Moreau & Garfinkel, 1999; Mufson, et al., 2004) and Puerto Rican adolescents (Rosselló & Bernal, 1999; Rosselló, Bernal & Rivera-Medina, 2012). Rosselló et al. (2012) proposed that IPT-A's focus upon decreasing conflict present in one's relationships, aligns strongly with the ideas of *familismo* and *personalismo*, two important concepts in many Latino cultures that place great value upon cultivating and maintaining positive relationships with one's family, peers, and community. Given IPT-A's effectiveness in treating depression, the decision was made to adapt it and create a prevention program focusing more explicitly on teaching adolescents communication strategies and interpersonal problem-solving skills to help prevent the occurrence of depressive episodes.

In 2006, Young and colleagues reported findings from their first study of the prevention program, which compared the effects of IPT-AST to those of usual school counseling (SC). Their sample included 41 students from three Catholic schools in grades 7 through 10. Their sample was overwhelmingly comprised of youth who identified as Hispanic, with this ethnic group characterizing over 90% of the sample. The children's outcomes on the Center for Epidemiologic Studies Depression Scale (CES-D) and their scores on the Children's Global Assessment Scale (CGAS) were analyzed. An Analysis of Covariance (ANCOVA) controlling for baseline scores on the CES-D was performed to compare the results for each intervention group at post-group, and then during the 3- and 6- month follow-up evaluations. The teenagers who participated in the IPT-AST groups had significantly lower CES-D scores, which indicates lower levels of depressive symptomatology, and higher CGAS scores, which corresponds to better levels of functioning. These differences, while smaller in magnitude, remained statistically significant at both the 3- and 6-month time points.

Young, Mufson and Gallop (2010) conducted a second study which once again compared IPT-AST to SC; however, this sample was comprised of 57 students in the 9th and 10th grades, 73.7% of whom self-identified as Hispanic. The researchers not only examined changes in CES-D and CGAS scores in their analyses, they also utilized scores from the Children's Depression Rating Scale-Revised (CDRS-R) to ascertain the effects of the different programs. Following the intervention, hierarchical linear modeling indicated that the IPT-AST group showed faster improvements on all three measures ($p \leq .01$), although the effects dissipated over time. Youth in IPT-AST had significantly lower scores on all three measures than did the controls at post-intervention and 6-month

follow-up, but the differences were no longer significant at the 12- and 18-month follow-up assessments.

Both of the aforementioned studies of IPT-AST demonstrate its promise as a preventive program. The findings suggest that IPT-AST, at least in the short-term, may produce greater changes than the types of counseling services that are currently available in schools. The adolescents in these studies were inner city youth, who were typically Hispanic or African American. While this is a strength of these studies, as compared to other prevention studies that have been conducted with primarily White youth, it is not known whether similar effects would be found in other ethnic and racial groups. As noted earlier, Cardemil et al. (2007) found large effects for Hispanic youth but not African American youth. Thus, it may be that prevention programs may be particularly effective for Hispanic adolescents. The prior IPT-AST studies were not large or diverse enough to examine the important question of whether ethnicity or race moderated intervention outcomes.

Current Study

The current study utilized data gathered as a part of the Depression Prevention Initiative study, a recently completed randomized controlled trial that compared IPT-AST to Group Counseling (GC) as delivered by school counselors for adolescents with elevated symptoms of depression. To date, Young and colleagues have reported on the main outcomes from the study (Young, Benas, Schueler, Gallop, Gillham & Mufson, 2016). They found that students who participated in the IPT-AST groups had significantly greater decreases in their CES-D scores compared to those in the GC intervention ($p < .05$). Minority status was examined as a potential moderator of rates of

change in depression. Although minority status did not moderate intervention outcomes, this was coded as White vs. non-White, which may have masked ethnic differences. The current study is exploratory in nature and sought to determine if differences emerged between students from three ethnic groups, White, Black, and Latino, beginning with the time that they were screened to participate in the project and ending following their participation in either IPT-AST or counseling groups (GC) in their schools. The current study focused on participants' depression scores at screening, baseline, mid-group, and post-group and examined whether there were mean-level differences between Black, Latino, and White participants. Thus, the current study differed from the larger study by Young et al. (2016), in that mean scores at the aforementioned time points were analyzed, rather than examining rates of change. Additionally, the current study looked at differences between the three main ethnic groups represented in the study's sample, rather than grouping participants as minorities and non-minorities, which fails to account for potentially differential effects within the ethnic groups previously analyzed as one "minority" group. Based on the findings of Cardemil and colleagues (2007) where African American participants showed similar rates of improvement in depressive symptoms, regardless of whether they were assigned to the experimental or control group, which differed from findings for Latino participants, it would be informative to determine whether there are differences between outcomes at the specified time points for White, Latino, and Black participants.

Methods

Participants

The participants were originally gathered as a part of a study comparing the efficacy of school-based IPT-AST groups to that of group counseling led by school counselors (GC) (Young et al., 2016). The 186 participants were in the 7th to 10th grade and between the ages of 12 to 16 ($M = 14.01$, $SD = 1.22$), and were recruited from middle and high schools that agreed to participate in the study. Roughly two-thirds of the sample (66.7%) was comprised of female students. Seventy-one participants (38.1%) identified themselves ethnically as Hispanic or Latino. Of the 71 Latino participants, 11 racially identified as Black, 55 as White, and 5 indicated that they were more than one race. For the purposes of the current study, all participants who identified as Hispanic or Latino, regardless of their race, were coded as Latino. This decision was based in large part on the fact that due to data collection requirements, participants had to identify both an ethnicity (Latino or Non-Latino) and a race. Thus, every Latino participant fell within a racial classification. Therefore, in order to analyze the data with Latinos as an ethnic category, their identification as a Latino became the classifying variable. Furthermore, while gathering demographic data, anecdotal evidence suggested that many of the Latino participants readily identified themselves as such or as having familial origins in a Latin American country, but then struggled when asked to choose a racial classification. For these reasons, coding all participants who identified as Latino as the classifying variable was the most appropriate way to address how most of the participants self-identified, along with enabling researchers to analyze Latinos as an ethnic group within the current study.

The 115 non-Latino participants fell into the following racial classifications: one American Indian participant (<1%), eight Asian participants (4.3%), 26 Black participants (14.0%), 71 White participants (38.1%), and nine bi- or multi-racial participants (4.8%). Due to limited numbers of participants from other ethnic groups, the current study's analyses will be limited to participants who identified as White ($n = 71$), Latino ($n = 71$), or Black ($n = 26$), for a total sample size of 168 adolescents. The sample was also diverse in regards to household income levels; households with gross annual incomes of over \$90,000 comprised 44.3% of the sample, with the next most represented income range being between \$25,000 and \$90,000 (38.4% of participants), and 17.3% of the sample earned less than \$25,000 per year.

Procedure

Participants were initially identified from middle and high school students whose scores on a screening measure, the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), were equal to or exceeded 16, which indicated the presence of elevated symptoms of depressive symptomatology ($n = 593$). After receiving parental consent and participants' assent to participate in the study, parents provided demographic information regarding themselves and their children. The potential participants then completed an eligibility evaluation, to determine if they met the study's inclusion criteria, which included endorsing at least two subthreshold or threshold depressive symptoms on the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS-PL; Kaufman et al., 1997), with one of them being depressed mood, anhedonia, or irritability. Exclusion criteria were high levels of suicidal ideation or self-injurious behaviors, severe cognitive or language delays, and/or current diagnoses of major

depressive disorder, dysthymia, psychosis, bipolar disorder, conduct disorder, or substance use disorder.

The 186 participants who met the inclusion criteria then completed a baseline assessment, which included the completion of a second CES-D, in addition to a variety of other measures. Following the baseline evaluation, adolescents were randomly assigned to either receive group counseling (GC) provided by their schools' counselors or IPT-AST delivered by members of the study's research team. The structure of the IPT-AST intervention included two individual sessions prior to the beginning of the groups, weekly group sessions for eight weeks, one individual session after the fourth group session which parents were invited to attend, and four individual "booster" sessions spread out over the course of six months following the final group session. The GC groups followed a similar schedule, in that they met weekly for eight weeks, had an individual mid-group session, and four individual booster sessions; however, GC group leaders only conducted one individual pre-group session with participants.

In addition to the previously mentioned screening and baseline evaluations, participants also participated in mid-group and post-group evaluations when they completed the CES-D, as well as other measures. The current study analyzed outcomes for White, Black and Latino participants in the sample as they relate to depressive symptomatology measured by the CES-D.

Measures

The current study focused on the CES-D, a 20-item self-report measure that examines the extent to which individuals have experienced various depressive symptoms during the past week (Roberts, Andrews, Lewinsohn, & Hops, 1990; Stockings, et al.,

2015). Items are rated on a scale of 0 to 3, with 0 signifying “rarely or none of the time” and 3 signifying “most or all of the time”. Thus, scores on the measure can range from 0 to 60, with a score of 16 or higher being thought to indicate the presence of elevated depressive symptomatology. While the creators of the measure described the cutoff score as being selected without any statistical calculations or reasoning, it has become a standard cutoff used across studies and populations (e.g. Dojka, Górkiewicz & Pajak, 2003). The CES-D is a commonly used tool to assess depressive symptomatology in adolescents. Stockings et al.’s (2015) meta-analysis of the CES-D’s use with children and adolescents evaluated the measure’s internal reliability, and found that Cronbach alphas ranged from 0.80 to 0.93 resulting in a pooled estimate of 0.88. Thus their findings indicate that the CES-D has good internal reliability when used with children and adolescents. Similarly, in their study of the psychometrics of the CES-D when used with adolescents, Roberts et al. (1990) found that it had good internal consistency, with alphas being 0.87 or higher, for both male and female participants.

Study Hypotheses

The current study examined the following questions. First, group differences in initial levels of depressive symptoms were evaluated by examining whether there were mean differences in screening CES-D scores between White, Latino, and Black participants. Given findings that minority youth may be at increased risk for depression, it was hypothesized that Latino and Black participants may have had higher screening CES-D scores than White participants. Differences between mean baseline CES-D scores were also examined, to determine whether these differences persisted or became more pronounced before the prevention programs began. This was done to determine whether

certain ethnic groups were more likely to show spontaneous improvements in depressive symptoms from screening to baseline prior to the initiation of the prevention programs.

Second, the study examined the efficacy of IPT-AST compared to GC for Black, Latino, and White participants. Based upon previous research, there were two main hypotheses. First, given the finding from Young et al.'s (2016) larger study, in which IPT-AST resulted in significantly greater improvements in depressive symptomatology, compared to GC, it was hypothesized that IPT-AST would have significantly larger effects (from baseline through post-intervention) across ethnic groups than GC. However, given the theoretical underpinnings of IPT-AST, coupled with past research (e.g. Young, Mufson & Gallop 2010; Young, Mufson & Davies, 2006) that has shown it to be effective with Latino youth, it was hypothesized that the effect size for IPT-AST would be larger for Latino participants compared to White and Black participants. Similarly, based upon Cardemil et al.'s findings in 2007 where Black participants showed similar rates in improvement regardless of their treatment condition, it was hypothesized that effect sizes for IPT-AST would be smallest for Black participants.

Data Analytic Strategy

Preliminary data analysis consisted of constructing line graphs for each of the three ethnic groups in the sample; each graph displayed the two experimental groups' CES-D mean scores at each measurement time point, with separate lines to indicate outcomes for those in the IPT-AST groups and GC groups. Then to examine any differences in CES-D scores prior to randomization, which included the screening and baseline evaluations, amongst the three ethnic groups, the following analyses were conducted. First, an ANOVA was conducted where the independent variable was

ethnicity, coded as Black, White, or Latino, and the dependent variable was the screening CES-D outcomes. Second, an ANCOVA was then conducted on baseline CES-D scores, controlling for screening CES-D outcomes, where the independent variable was again ethnicity. An ANCOVA was selected as the statistical technique due to its ability to analyze outcomes while controlling for the initial screening score.

Next, to ascertain if there were differences in scores on the CES-D at mid-group and post-group as a function of intervention condition and ethnicity, a mixed ANCOVA, controlling for the screening CES-D scores, was implemented. Using the ANCOVA, mid-group and post-group outcomes were analyzed to determine if the outcomes varied based upon the type of intervention received or participants' ethnicities. More specifically, intervention condition (IPT-AST or GC) and ethnicity (coded as Black, White, or Latino) were entered as independent variables and then the interaction of intervention condition and ethnicity were entered into the statistical model to examine whether ethnicity moderated intervention outcomes. Thus the split-plot or mixed ANCOVA included the two between-subjects variables of ethnicity and intervention condition along with the one dichotomous within-subjects variable of evaluation time point (mid-group versus post-group). Thus, the mixed ANCOVA included a three-way interaction term of intervention condition, ethnicity, and evaluation time point. Any significant effects were explored through post-hoc analyses.

Results

Preliminary Analyses

Table 1 presents actual mean CES-D scores at each time point, separated by ethnicity and intervention condition. Figures 1, 2, and 3 display the actual CES-D mean

scores at each measurement point for White, Black, and Latino participants (respectively), with separate lines to indicate outcomes for those in the IPT-AST groups and GC groups. Figure 4 displays the mean CES-D scores at screening and baseline for each ethnic group.

Regarding any ethnic differences pre-randomization, a one-way ANOVA showed that there were no significant differences in depressive symptomatology between the three ethnic groups at screening ($F = 2.30, p = .10$). Next, an ANCOVA was performed to determine if differences between mean CES-D scores became apparent, after controlling for screening scores, at the baseline time point, which occurred prior to the participants receiving any intervention. Differences among the ethnic groups were not significant ($F = 1.24, p = .29$), yet, descriptively, Latino participants trended toward smaller reductions in their CES-D scores from screening to baseline (7.66 points) than Black (8.77 points) or White (8.63 participants). Thus, although Black participants had slightly higher scores at screening, visual analysis suggests that their symptoms improved to a level similar to Latino participants at baseline (Black: $m = 16.46, sd = 7.24$; Latino: $m = 16.07, sd = 8.94$). Although the baseline CES-D scores across these three ethnic groups were not statistically significant, descriptively, White participants scores were lower than the other two ethnic groups ($m = 13.62, sd = 8.10$).

Intervention Effects for Primary Outcomes

To test if there were differences in CES-D scores at mid- and post-group as a function of intervention condition and ethnicity, a mixed ANCOVA was utilized which again controlled for screening scores. Specifically the model was a 3 (ethnicity) x 2 (intervention condition) x 2 (mid- and post-group time points) mixed ANCOVA with

screening scores included as a covariate. Table 2 summarizes the results from this primary ANCOVA. There were no statistically significant main effects for intervention condition across the mid and post-group evaluations [$F(1, 157) = .75, p = .39$] and no significant effect of the interaction between intervention condition and ethnicity [$F(1, 2) = .93, p = .40$] or intervention condition, ethnicity, and time point [$F(1, 2, 1) = .47, p = .63$]. However, there was a significant main effect of ethnicity on CES-D scores [$F(2, 157) = 6.20, p < .01, \text{partial } \eta^2 = .07$]. Figure 5 displays the estimated or adjusted mean CES-D scores at the mid- and post-group time points, broken up by ethnicity and intervention condition.

To ascertain if utilizing a mixed ANCOVA for the previously described analyses masked potentially significant effects that might be seen if the two time-points were analyzed separately, two additional ANCOVAs were generated. Again, the results from these additional ANCOVAs yielded the same results as the 3-way analysis: at each time period, only the main effect of ethnicity was significant. That is, at the mid-group time point, while there was no statistically significant main effect for intervention condition [$F(1, 157) = .23, p = .64$] and no significant effect of the interaction between intervention condition and ethnicity [$F(2, 157) = .35, p = .70$], there were statistically significant differences in mid-group CES-D scores based on ethnicity [$F(157, 2) = 4.24, p = .02, \text{partial } \eta^2 = .05$]. Similarly, the 3 (ethnicity) x 2 (intervention condition) ANCOVA for the post-group time point also showed that intervention condition again did not have a main effect [$F(1, 157) = .87, p = .35$] nor was there a significant effect of the interaction between intervention condition and ethnicity [$F(1, 2) = 1.23, p = .29$], while there

continued to be statistically significant differences in post-group CES-D scores based on ethnicity [$F(157, 2) = 5.91, p = <.01, \text{partial } \eta^2 = .07$].

Post-Hoc Analyses

Given that finding that mid- and post-group outcomes varied significantly based upon ethnicity, additional analyses were performed to determine which between-group differences have contributed to the significant finding. Pairwise comparisons were conducted, that compared ethnic groups' means at the mid- and post- group time points; thus, means generated were for each ethnic group, and not subdivided based upon which intervention was received. These analyses indicated that after controlling for the screening score, at the mid-group time point, the mean CES-D score was significantly lower for White participants ($m^a = 12.54, se = 1.02$) compared to Latino participants ($m^a = 16.91, se = 1.02, p < .01, d = .51$). At mid-group, the mean CES-D score for Black participants ($m^a = 14.53, se = 1.88$) did not differ significantly from Latino or White participants. At the post-group time point, the mean CES-D score for White participants ($m^a = 9.78, se = 1.03$) was significantly lower than those of Latino ($m^a = 14.59, se = 1.03, p < .01, d = .55$) and Black participants ($m^a = 14.28, se = 1.90, p = .04, d = .49$).

Discussion

Overall, results showed that GC and IPT-AST had similar effects for White, Latino, and Black participants with there being no statistically significant differences between the two intervention conditions and no evidence that ethnicity moderated outcomes. This finding is notable in that it differed from Young et al.'s (2016) findings for the larger study, from which the current study's sample was drawn. Using a 3-level hierarchical linear model (HLM), that included participants' schools and the group in

which they received either IPT-AST or GC as effects, and controlled for screening CES-D scores, Young and colleagues found that IPT-AST produced significantly greater reductions in CES-D scores, compared to GC ($t(181) = 2.03, p = .04, d = .31$). However, the larger study examined change from baseline until 6-months post-group, thus including an additional time point not present in the current study's model. It is important to note that between the post-group and 6-month follow-up, the mean CES-D scores of both those in the GC and IPT-AST conditions continued to decrease. The decision to not include the 6-month time point may account for the divergence between the current study's findings and those of the larger study. Additionally, the larger study's sample differed from the present study in that it had a larger sample ($N = 186$), and, as previously mentioned categorized participants into categories of minority and non-minority. By categorizing their participants as such, they were able to maintain the statistical power that was compromised in the current study, especially by selecting Black participants as a separate group to be analyzed ($N = 26$). As a result, the larger study had increased likelihood of detecting a significant difference between intervention conditions, whereas due to the small sample size of Black participants in the current study's analyses, there may not have been adequate power to detect the medium effect size ($d = .31$) found in the larger study.

While there were no main effects of intervention condition, nor an interaction of intervention condition, ethnicity or time point, CES-D scores did vary significantly as a function of ethnicity. Specifically, at mid-group, the adjusted mean CES-D score of White participants ($m^a = 12.54$) was significantly lower than that of Latino participants ($m^a = 16.91$). A visual analysis of Figures 3 and 4 helps to understand this finding. As

seen in Figure 3, from baseline to mid-group, the Latino participants in the GC condition showed an increase in their mean CES-D score (baseline $m = 16.08$, mid-group $m = 18.22$), whereas those in the IPT-AST condition did not have an increase in their mean score (baseline $m = 16.06$, mid-group $m = 15.37$). The increase in CES-D scores for Latinos in GC from baseline to mid-intervention likely contributed to the significantly higher mid-group CES-D scores of Latino participants as compared to White participants.

At post-group, the adjusted mean CES-D score of White participants ($m^a = 9.78$) was significantly lower than those of both Latino ($m^a = 14.59$) and Black participants ($m^a = 14.28$). Again, the Latino participants assigned to the GC condition appeared to be driving the significant difference between the mean CES-D scores of the Latino and White participants. Latinos in the GC condition initially trended toward an increase in their mean CES-D score at mid-group, and then never recovered to the point where their mean CES-D score was equal to or less than their mean baseline score. The Black participants assigned to the GC condition, who had initially shown a decrease in CES-D scores at mid-group, trended towards an increase in their mean CES-D score at post-group. On the other hand, White participants showed a trend toward decreases in CES-D scores regardless of intervention condition. The finding that at post-group, Black participants in the GC condition showed an increase in their scores (mid-group $m^a = 14.81$, post-group $m^a = 15.57$) while White participants in both the GC (mid-group $m^a = 12.47$, post-group $m^a = 9.14$) and IPT-AST conditions (mid-group $m^a = 12.60$, post-group $m^a = 10.42$) continued to show a decrease in CES-D scores, appears to have contributed to the significant difference between Black and White participants at post-intervention.

Taken together, a trend emerged where for Black and Latino participants, participation in the GC intervention was somewhat associated with slight increases in CES-D mean scores, in Latinos the increase was evident at mid-group, and while the mean CES-D score was lower at post-group, it still was higher than their baseline mean. In Black participants, the trend toward an increase in the CES-D mean score was present at the post-group time point, and despite the increase, their post-group CES-D mean score did not exceed that of the baseline.

The findings from the current study differ with those of past research. Unlike the findings in Stice et al.'s 2010 meta-analysis, which discovered moderate effect sizes in depression prevention studies with samples comprised of more than 45% ethnic minorities, the current study, which was comprised of 57% non-White participants, did not produce statistically significant findings regarding the effects of IPT-AST; therefore, effect sizes were negligible. The current study compared the effects of IPT-AST to the effects of an active intervention control group, whereas many of the depression prevention studies to date have utilized wait-list or assessment-only control groups. This difference in the level of intervention received by the control group may have contributed to the current study's null findings in which IPT-AST was not significantly more efficacious than GC, in contrast to past studies' significant findings.

Marchand, Ng, Rohde, and Stice's (2010) study of a cognitive-behavioral depression prevention program examined ethnic differences in outcomes between European and Latino American participants. They found a significant interaction between time and intervention condition, with the cognitive-behavioral program producing greater reductions in depressive symptomatology. However, there was no significant main effect

for ethnicity nor was there a significant interaction between time, intervention condition, and ethnicity, indicating that the effects of the prevention program did not differ as a function of ethnicity. While the significant main effect for the cognitive-behavioral program may have been driven by the fact their comparison group did not receive any intervention in that it was a waitlist control group, there are other differences that may have accounted for divergence in their findings compared to those of the current study. Despite the fact that Marchand and colleagues had smaller overall Ns than the current study (N = 130 in one trial and N = 133 in another trial) contrasted with the current sample of 168, by only comparing students from two ethnic groups, 98 European American participants and 32 Latino participants, they were able to maintain statistical power that was weakened due to the current study's small number of Black participants ($n = 26$). In the current study, at post-group, there was a significant difference between the mean score of Black participants, and that of White participants. Thus, by not including Black participants in their sample Marchand and colleagues may have limited their ability to detect a relationship between ethnicity and the effects of their program, despite the stronger statistical power in their design. Additionally, the authors noted that the assumption of sphericity was violated, and an examination of the mean scores at baseline suggests that depressive symptomatology may have been higher in the intervention group than the controls. As a result, their significant findings of decreases in the participants assigned to receive the cognitive behavior program may be partly reflective of that group's regression toward the mean, rather than actual effects of the program. However, given that the clinicians utilized the Beck Depression Inventory

(BDI), a reliable measure of depressive symptomatology, it is likely that regression toward the mean did not pose a large threat to the validity of researchers' findings.

The results of the current study differed from those of the Cardemil and colleagues' findings where the Penn Resiliency Program produced significant improvements in depressive symptoms for Latino participants compared to the no-intervention control group, but failed to do so for African-American participants, who showed similar decreases in symptoms regardless of whether they were in the intervention or control group. Similar to previously described studies, Cardemil and colleagues also utilized a no-intervention control group in their design, which may have contributed to the findings regarding the program's effectiveness. Furthermore, with their sample of 168 Latino and African American children, the authors had greater statistical power to detect effects. Conversely, due to the small sample size of Black participants in the current study, there was low statistical power to detect differences between the control and intervention group, thus despite the fact that the control group received a comparable quantity of intervention compared to the IPT-AST group, the finding that across groups Black participants did not show significant improvement must be interpreted with caution.

The current study and that of Cardemil and colleagues were similar in that they showed no differences in levels of depressive symptoms between Latino and Black participants prior to participating in the depression prevention program. This similarity emerged despite the fact that the two studies utilized different measures to assess depressive symptoms, along with there being differences in the type of prevention program being tested: Cardemil and colleagues examining the effects of a program that

they viewed as both universal and selective, and the current study analyzing an indicated program. After the pre-intervention assessment, the studies differed in the manner in which data were then analyzed. Cardemil and colleagues' next assessment occurred post-group, whereas the current study incorporated an additional baseline assessment, where a non-significant decrease in scores was observed. By failing to include an additional measurement time point prior to participation in the group, effects such as spontaneous recovery or regression toward the mean may have been overlooked or been misattributed to the effect of the intervention.

Overall, while the current study did not find significant differences in outcomes between those who participated in IPT-AST and those who received GC, it produced findings similar to those of Cardemil and colleagues'. Specifically, Latinos trended toward non-significantly greater improvement in the IPT-AST condition while those in the GC conditions trended toward showing increases in symptoms resulting in post-group symptomology similar in levels to what was reported at baseline. Also similar was the finding that compared to the Latino participants, the Black participants trended toward showing smaller differences in reported depressive symptoms as a function of intervention condition.

The current study had both divergent and similar findings to those of Young and colleagues in 2006 and 2010, which found significant differences between IPT-AST and school counseling as usual at post-group and during specific follow-up time points. While the past studies utilized individual school counseling as usual as a control group, they met at intervals determined by the counselor. In the current study, GC groups met once per week for 8 weeks, included individual pre- and mid-group sessions, along with 4 booster

sessions. GC sessions also lasted for the same amount of time as IPT-AST groups. Thus, attempts were made to ensure that participants in the control group received a similar amount of therapeutic intervention as those in the experimental group. The findings from the current study suggest that usual care provided in schools may be somewhat less effective for Black and Latino youth, in comparison to White youth, although this is speculative. Considering that the past studies of IPT-AST had less intensive intervention for the students in the control groups, this may explain why the effects of IPT-AST appeared so robust in these earlier studies, especially when considering that the majority of those studies' samples were Latino youths.

Another important difference is that these past studies of IPT-AST utilized different measurement time points than the current study. In the current study, the CES-D was administered twice prior to adolescents beginning the groups. In the larger study, Young and colleagues (2016) found high rates of spontaneous improvement between the screening and baseline time points. Thus, similar to Cardemil and colleagues, Young and colleagues' previous studies may have misattributed these spontaneous improvements to the effects of the programs, resulting in an overestimation of the effects of the interventions. While it is not clear what drove the observed spontaneous recovery, it is possible, that after participating in consent meetings, where both interventions were described to participants, their anticipation about the upcoming groups may have contributed to less depressive symptoms being reported at the baseline time point.

Additionally, as noted previously, the samples in the previous studies conducted by Young and colleagues in 2006 and 2010 both were comprised overwhelmingly of Latino participants. Therefore, it is likely that the groups mostly consisted of Latino

youths. While IPT-AST is a manualized intervention, there is still flexibility in terms of group discussions and exercises. As previously introduced by Rosselló and colleagues (2012), IPT-A's efficacy with Puerto Rican adolescents may be due to its resonance with the value placed upon relationships within Puerto Rican and other Latino cultures. However, it is possible that rather than these values intrinsically aligning, when delivered within a group with a large percentage of Latino participants, the group discussions and processing may have emphasized its alliance with cultural norms and values, making them more therapeutic and beneficial for participants with such values. Given that the current study's sample was more diverse, in that Latino participants were not the overwhelming majority, groups were likely more heterogeneous than those of past studies. Group sessions and discussions may not have highlighted or stressed the ways in which IPT-AST aligns with cultural values simply because the group did not have a similar or unified cultural experience. This lack of expressed alignment with cultural norms and values may have contributed to the current similarities between the IPT-AST and control conditions rather than the significant differences seen in past studies. Similarly, the previous studies of IPT-AST typically took place in one or two schools; however, the current study had a sample that consisted of students from 10 different public schools that varied in terms of demographic factors such as socioeconomic status, ethnic composition, and community type (urban, suburban, or rural). Thus, not only was there diversity within groups, but also between the groups at different schools.

The ability to draw conclusions regarding the previously described trends in outcomes is limited by the small sample size in the current study. While statistical power was not calculated for the current study, Marchand, Ng, Rohde, and Stice (2010) reported

that in comparing Latino and European American participants assigned to two intervention conditions, over four time points, they would need a minimum of 390 participants in both ethnic groups, or a sample of 780 participants to have an 80% chance of detecting a small effect size. Thus, the current sample size of 168 with three ethnic groups was significantly underpowered to detect small moderation effects.

Due to limited statistical power, it is possible that the previously discussed trends reflect the negative effects of GC in preventing the worsening of depressive symptoms in Black and Latino children, while highlighting the similar effects that both IPT-AST and GC have for White youths. However, given the limits to the statistical power of the current study's analyses, it is important to exercise caution in interpreting non-significant findings as they may be indicative of statistical error rather than actual lack of differences between the two interventions.

In addition to attempting to gather larger samples to increase statistical power, it will be useful for future studies to further examine the role of culture in outcomes. Factors such as acculturation, and feelings of belonging within one's school were not included in the current study's data analysis, and may be helpful in future studies' analyses. Relatedly, analyzing the effects of ethnicity not only in outcomes, but also in participant recruitment will be important as well. The small sample of Black participants not only limited researchers' ability to detect significant differences, but it also raised the question of whether these participants were representative of Black youths at participating schools, or were a unique and self-selected group. Assessing whether response rates varied as a function of ethnicity will be useful in determining the

representativeness of the participants, and also help to assess if there are groups that may require alternative recruitment strategies.

Overall the results from the current study did not find ethnicity to have a moderating effect on outcomes following the depression prevention groups. However, there were significant differences in the mean CES-D scores of participants of different ethnic groups, where at mid-group, Latino participants' mean score was significantly higher than that of White participants. At post-group, both Latino and Black participants had mean CES-D scores that were significantly higher than their White counterparts. Further analyses suggested that these differences may have been driven by a particularly poor response in Latino and Black participants to the control group condition, which unlike many control conditions, consisted of an active intervention that involved weekly groups with a school counselor. The lack of a significant moderating effect of ethnicity may have been attributable to limited statistical power, along with increased heterogeneity in groups and between schools. Future research ideally will be able to gather larger samples to increase statistical power, while continuing to incorporate vigorous control groups, and multiple measurement time points, to enhance knowledge regarding the relationship between ethnicity and depression prevention program outcomes.

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