Published in final edited form as:

J Clin Psychol. 2009 April ; 65(4): 337–351. doi:10.1002/jclp.20560.

The Moderation of an Early Intervention Program for Anxiety and Depression by Specific Psychological Symptoms

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Abstract

The current study examined the influence of a number of psychological factors on the effectiveness of an early intervention program targeting anxiety and depression in a non-clinical sample of college students. The program was influenced by the Cognitive-Behavioral Analysis System of Psychotherapy (McCullough, 2000) delivered in a two-hour computer-based educational program. Participants completed measures of depression, anxiety, and general distress prior to the prevention program and then again eight weeks later. Additionally, participants were assessed for past Major Depression, sleep related difficulties, a number of Anxiety Disorders, and suicide ideation. Moderation of the effectiveness of the early intervention program by these factors depended on the dependent variable of interest. Specifically, the effectiveness of the intervention program on symptoms of depression was moderated by insomnia; symptoms of anxiety by past Post-Traumatic Stress Disorder and Specific Phobia as well as sleep problems related to nightmares; and symptoms of general negative affect by Social Phobia and suicide ideation. Implications are discussed.

Keywords

Early Intervention; Anxiety; Depression; Moderators

Lifetime (and 12-month) prevalence estimates for Major Depressive Disorder (MDD) and anxiety disorders are approximately 17.1% (and 10.3%) and 24.9% (and 17.2%), respectively (Kessler, McGonagle, Zhao, & Nelson, 1994). Furthermore, the comorbidity between MDD and anxiety disorders is estimated to be approximately 50% (Sanderson, Beck, & Beck, 1990). Individuals experiencing MDD and anxiety disorders are more likely to experience a number of adverse consequences, including increased risk of immune deficiency, coronary heart disease and other vascular disorders, smoking and nicotine dependence, alcohol and drug abuse, higher relative risk of death, and suicide (Angst, Stassen, Clayton, & Angst, 2002; Cuijpers & Smit, 2002; Kubzansky, Kawachi, Weiss, & Sparrow, 1998; Sonntag, Wittchen, Höfler, Kessler, & Stein, 2000; Zorrilla, Redei, & DeRubeis, 1994). Accordingly, there have been substantial efforts to manage MDD and

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anxiety disorders. However, it is also important to consider targeting those either at risk for psychopathology or who are experiencing mild or sub-threshold symptoms as such symptoms are associated similar negative outcomes (Cuijpers & Smit, 2002; Kubzansky et al., 1998; Sonntag, Wittchen et al., 2000; Zorrilla et al., 1994). Such programs have typically been labeled as prevention programs.

Prevention programs for depression and other psychological problems have been primarily developed and evaluated in child and adolescent samples. These programs typically include elements of Cognitive-Behavioral Therapy (CBT) and Interpersonal Psychotherapy. Examples include the Coping with Stress Course (Clarke, Hawkins, Murphy, & Sheeber, 1995), the Resourceful Adolescent Program (Schochet, & Ham, 2004), and the Penn Resiliency Program (Gillham, Reivich, Freres et al., 2006). Generally, these programs have been shown to be helpful. However, effect sizes are typically small to moderate and the degree of effectiveness appears to depend on specific aspects of the sample included.

Horowitz and Garber (2006) examined, via meta-analysis, the efficacy of 30 studies on prevention programs aimed at children and adolescents, including two studies with college students. Generally, they found that studies using a universal prevention method (i.e., inclusion of participants regardless of symptoms or lack thereof) were found to evidence lower effect sizes compared to selective and indicated prevention programs (i.e., selection based on the presence of identified risk factors and sub-threshold symptoms, respectively). Additionally, they concluded that while there was evidence for the general effectiveness of the programs reviewed, the *preventive* effect of these programs was small and that the majority of programs were more accurately described as treatment.

Specifically, to be considered a prevention effort, the study needed to demonstrate “an increase in depressive symptoms among members of the control group and no increase or a diminished increase of symptoms in the intervention group” (Horowitz & Garber, 2006; p. 409). However, none of the universal programs satisfied these criteria. Additionally, all but one of the selective programs was classified as treatment due to reductions in the intervention groups compared to controls. Considering these results, it may be more useful to consider developing programs targeting sub-threshold symptoms (i.e., what might be more accurately termed early intervention) than true prevention. Specifically, given that sub-threshold symptoms are associated with negative outcomes and, as Horowitz and Garber (2006) point out, that such symptoms are highly static in universal samples, targeting such broad samples seems inefficient. By focusing on those individuals who experience sub-threshold symptoms via early intervention, we can hope to prevent later negative outcomes and demonstrate the utility of such programs.

In addition to the influence of program type, Horowitz and Garber (2006) also examined the moderation of program effectiveness by a number of variables including sex, length of program, age, and length of follow-up assessment. While none of these were found to significantly moderate the effectiveness of the programs, Horowitz and Garber (2006) discussed the importance for continued examination of potential moderators.

Specifically, they argued that identifying potential moderators is important in determining for whom such programs will be most effective and, conversely, for whom they may not be as effective. Such information is important in determining how to most effectively and efficiently implement such programs. Furthermore, the influence of potential moderators will also help identify the need to alter programs to increase their effectiveness in certain populations. Identifying moderators may also inform how to make those modifications to programs so that they are most effective in specific groups.

Horowitz and Garber (2006) primarily discuss demographic characteristics (e.g., age, sex, & ethnicity) as potentially important moderators. However, research on moderators of treatment effectiveness have determined factors such as the severity and chronicity of symptoms, comorbidity, suicide ideation and hopelessness, and general functioning are often important variables in determining outcome (Curry et al., 2006; Dow et al., 2007; Rhode, Seeley, Kaufman, Clarke, & Stice, 2006). It seems that such variables might also be important in determining the effectiveness of early intervention programs. Furthermore, consistent with Horowitz and Garber's (2006) suggestion that factors such as age should be seriously considered, it is important to expand existing treatment programs for different age groups.

As mentioned previously, the majority of these programs have been developed for child and adolescent populations. However, college aged individuals represent another highly relevant age group. Specifically, college represents a time of major upheaval and stress, and includes typical ages of onset for several psychological problems. Additionally, while the majority of college students may not experience clinically diagnosable episodes of depression and anxiety, using daily diary methodology, Stader and Hokanson (1998) found that college students ($N = 48$) experienced 1.51 depressive *episodes*, on average. An episode was defined as an increase in self-reported depressive symptoms on the Brief Symptom Inventory over a T-score of 70, averaged across 45 days of data collection. Additionally, the average length of these *episodes* was 1.34 days. These data combined with the reality that young adulthood represents the age of onset for many psychological conditions support the continued development and implementation of early intervention programs for depression and anxiety with college aged individuals.

In addition to the need for identification of potential moderators of early interventions, some authors have commented on the need to consider the appropriateness of program methods to different age groups (Horowitz & Garber, 2006). For example, presenting overly simplistic models to college aged individuals may elicit negative reactions and lack of adherence. It is an important balance one must achieve in developing age appropriate programs that are both useful and acceptable to clients. Related to the issue of appropriateness is the issue of efficiency.

Specifically, in an early intervention model targeting sub-threshold individuals, it does not make sense that a program consist of a level of intensity similar to that of treatment. Rather, an early intervention program aimed at those not experiencing current distress would likely need to be substantially briefer in order to attract and retain members. We attempted to

develop a program that was sensitive to the developmental appropriateness issue as well as to the need to present materials in a time efficient and engaging manner.

The Cognitive Behavioral Analysis System of Psychotherapy (CBASP; McCullough, 2000) was chosen as a basis for the current program. CPASP was originally developed as an intervention for chronic depression. Some of its principles can be adapted to a variety of problems and learned quickly enough to avoid the need for multiple meetings over a prolonged period of time.

Some of the techniques involved in CBASP are more focused on interpersonal interactions than on specific symptoms. This makes its general approach highly advantageous for adaptation as an early intervention program for individuals not experiencing prominent symptoms, but who are entrenched in a highly social environment (i.e., college). One component of CBASP, termed situational analysis, involves a detailed examination of how a specific situation might unfold, and in this process, clients often find that identifying thought patterns and the generating alternative interpretations requires a higher degree of abstract thinking - an area in which college students may be more adept. Lastly, there is some evidence that most clients find satisfaction in the identification of the connections between thoughts, behaviors, and situational outcomes (Cukrowicz, Burns, Minnix, Reitzel, & Joiner, 2005; Cukrowicz & Joiner, 2005; Driscoll, Cukrowicz, Reardon, & Joiner, 2004; McCullough, 1984; McCullough, 1991). These principles typically generalize across situations over time (Keller et al., 2000; McCullough, 2000). Considering these points and data supporting the efficacy of CBASP as a treatment model for dysthymia and/or chronic depression (Keller et al., 2000; McCullough, 2003; Riso, McCullough, & Blandino, 2003; Schatzberg et al., 2005) CBASP and the situational analysis approach represent a good candidate on which to base an early intervention program for depression and anxiety in college students.

The primary goal of this study was to explore potential moderators of the program's effectiveness. Typical moderating factors explored in past research have included sex, age, and program type. We sought to extend the investigation of potential moderation of the effectiveness of the program to specific types of symptoms. Specifically, the purpose of the present study was to determine the influence of past MDD, history of specific anxiety disorders, sleep disturbance, and suicide symptoms (i.e., the desire for death, suicide ideation, and suicide urges and plans) on the efficacy of an early intervention program aimed at depression and anxiety. While this examination for potential moderators was exploratory in nature, it was generally anticipated that those individuals identified as experiencing difficulties with the various potential moderators would benefit less from the early intervention than those without such problems. For example, an individual with elevated suicide ideation may experience less benefit as a function of increased severity and/or hopelessness. These experiences may influence the perception of the information being provided, such that the participant does not feel hopeful that implementing the strategies will provide benefit. Previously, we showed that the early intervention program results in a reduction in symptoms of anxiety and depression (Cukrowicz & Joiner, 2007). In this study we explore symptom-related moderators of this effect.

Method

Participants

Of 238 participants who began data collection, 165 individuals (mean age = 19.19 years, SD = 1.50, 116 females, 49 males) were included in the analyses for the current study. Of the initial sample of 238 individuals, 23 participants did not complete the follow-up assessment (a 90% return rate). Eleven of these participants were in the control group and 12 were in the prevention group. Statistical (*t*-test) comparisons of scores on all pre-intervention questionnaires between those completing the follow-up assessment and those who did not were non-significant. Additionally, 50 participants were excluded due to moderate and greater reported symptoms of depression and anxiety on the Beck Anxiety Inventory (BAI) and/or Beck Depression Inventory (BDI; see below for explanation of exclusion criteria).

Participants were undergraduate students from a large southeast university and received course credit for participation. The ethnic breakdown of the sample was 71.5% Caucasian, 10.3% African-American, 13.3% Hispanic, 2.4% Asian, and 2.4% other. Inclusion criteria were: complete data for the pre-intervention and follow-up assessments and pre-intervention BAI and BDI scores less than or equal to 18.¹ Of the 155 participants included in the current sample, 76 participants were randomly assigned to the control group and 79 to the prevention program group. The control and prevention groups did not differ significantly with regard to gender, age, and ethnicity (p s > .05).

Materials-Outcome Variables

Beck Depression Inventory-II (BDI)—The BDI is a 21-item self-report inventory used to assess the presence of depressive symptoms within the previous two weeks. Participants rate various symptom descriptions on a scale of 0 to 3 with higher numbers indicating greater symptom severity. The validity and reliability of the BDI have been demonstrated in multiple samples (see Beck & Steer, 1987 for a review).

Beck Anxiety Inventory (BAI)—The BAI is a 21-item self-report inventory used to assess the presence of general symptoms of anxiety within the previous two weeks. Participants rate various descriptions of anxiety symptoms on a scale of 0 (not at all) to 3 (severely [I can barely stand it]) with higher scores on the BAI indicating greater symptoms severity. The BAI's reliability and convergent and discriminant validity have been well supported in a variety of populations (e.g., Beck & Steer, 1993).

Positive and Negative Affect Schedule – Negative Affect Subscale (PANAS NA)—The PANAS NA subscale is a 10-item self-report inventory used to assess general and specific elements of symptoms consistent with the tripartite model of depression and anxiety (Clark & Watson, 1991). Participants were instructed to complete this measure with respect to the previous two weeks. Higher scores on NA represent higher levels of distress. The

¹This cutoff score for the BAI and BDI was established to ensure that participants were not currently experiencing significant symptoms of anxiety and depression. This is particularly important as the program was aimed to *prevent* symptoms of depression and anxiety rather than treat such symptoms. Scores equal to or less than 18 are considered to be in the “normal” and “mild” severity range on these measures (Beck & Steer, 1993; Beck & Steer, 1997).

validity and reliability of the PANAS have been well demonstrated (Watson, Clarke, & Tellegen, 1988).

Materials-Potential Moderators

Participants' lifetime experience with MDD was assessed using the Inventory to Diagnose Depression – Past (Zimmerman & Coryell, 1987). Lifetime history of Post Traumatic Stress Disorder (PTSD), Panic Disorder, Social Phobia, and, Generalized Anxiety Disorder (GAD) was assessed by administering items from the Structured Clinical Interview for DSM-IV Diagnosis (SCID; First, Spitzer, Gibbon, & Williams, 2005) in a self-report format.

Inventory to Diagnose Depression- Past (IDD-P)—The IDD-P is a 22 item self-report inventory used to diagnose MDD. The IDD-P was used to assess lifetime experience of these symptoms. Previous studies have indicated adequate reliability, internal consistency, and validity for this inventory (Zimmerman & Coryell, 1987). Scores on this scale represented a variable corresponding to past history of depression. Those endorsing a sufficient number of symptoms to meet criteria for a previous depressive episode comprised the past history group. Twelve participants were included in the past history group. Though this is a low percentage of participants with a past history, others who would have been categorized in this manner may have been eliminated through the BAI and BDI exclusion criteria used to ensure the intervention was preventive.

Structured Clinical Inventory for DSM-IV Axis Disorders (SCID)—A 47 item self-report inventory of questions from this inventory was used to assess lifetime history of anxiety disorder symptoms (i.e., PTSD, Panic Disorder, Social Phobia, Specific Phobia, GAD). Previous studies have indicated adequate reliability and validity (First, Spitzer, Gibbon, & Williams, 1997). Scores on this scale were compiled to determine if participants endorsed a significant number of symptoms for any of the anxiety disorders to meet criteria for that disorder in the past. Those meeting the criteria for one or more previous anxiety disorders comprised the past history anxiety disorder group. Twenty-seven participants were included in the past history anxiety disorder group.

Depression Severity Index - Suicide Subscale (DSI-SS)—The DSI-SS is a measure of suicide ideation that was developed as part of the Hopelessness Depression Symptom Questionnaire (Metalsky & Joiner, 1997). The DSI-SS is a four-item self-report questionnaire designed to identify the frequency and intensity of suicidal ideation and impulses during the past two weeks. Scores on the DSI-SS range from zero to 12 with higher scores reflecting greater severity of suicidal ideation (Joiner, Pfaff, & Acres, 2002). Internal consistency and construct validity have been demonstrated (Joiner et al., 2002). Those participants receiving a score of zero, one, or two were designated as low suicide risk. A total of 14 participants received scores of three or greater and were designated to be high suicide risk.

Insomnia Severity Index (ISI)—The ISI is a seven-item self-report measure used to assess symptoms of insomnia and the degree to which these symptoms cause distress (Bastien, Vallieres, & Morin, 2001). Scores on the ISI range from zero to 28 with higher

scores indicating greater levels of disturbance. Scores of 14 or greater are consistent with clinically significant insomnia. Participants who scored 14 or greater were designated as having significant problems with sleep related to insomnia. A total of 15 participants met this criterion. The internal consistency and validity of the ISI has been demonstrated (Bastien et al., 2001).

Disturbing Dreams & Nightmares Severity Index (DDNSI)—The DDNSI is a five-item self-report measure used to assess the general severity of sleep disturbance caused by disturbing dreams and nightmares (Krakow, Schrader, & Tandberg, 2002). The DDNSI requests information regarding the frequency of disturbing dreams (i.e., nights per week, number of nightmares per week) and the degree of impact they have on one's sleep (awakening due to nightmares, severity of nightmare problem, and nightmare intensity). Scores on the DDNSI range from zero to 37 with higher scores indicating greater levels of disturbance. Scores greater than 10 are consistent with clinically significant difficulties with disturbing dreams and nightmares. Eight participants received a score of 10 or greater and were identified as having sleep problems related to disturbing dreams and nightmares.

Procedures

Participants completed the data collection and prevention program session in small groups of between two and 27 participants. All assessment and program presentation was conducted via computer in order to further enhance the attractiveness of the program to college aged individuals. Such a presentation medium was chosen due to the increasing level of technological connectedness in college students, the ability to present identical materials to participants, and the ability for individuals to learn at their own pace. Furthermore, there is evidence supporting the effectiveness of computer and other technology-oriented treatment implementations (Kenardy et al., 2003; Newman, 2002; Newman, Consoli, & Taylor, 1997; 1999; Newman, Kenardy, Herman, & Taylor, 1997; Przeworski & Newman, 2004; Schmidt & Vasey; 2000; 2002). The initial administration of the assessment measures described above occurred immediately prior to presentation of the program. Participants were randomly assigned to the control and prevention program conditions.

The prevention and control programs are described in more detail by Cukrowicz and Joiner (2007). Both programs lasted approximately two hours with a 10-minute break halfway through the session. Additionally, both programs contained segments during which background information on depression and anxiety was presented. These segments were extended in the control program. Participants in the prevention program condition also received additional segments designed to teach them the purpose and principles adapted from CBT and CBASP as a prevention model.

Upon completion, all participants were given a packet containing copies of the slides used in the program. Additionally, prevention participants received a number of worksheets for practice and other materials designed to facilitate understanding and completion of the worksheets. Participants also received an email once during the eight week period between initial and follow-up administrations to remind them about the principles presented in the

programs. Approximately eight weeks after the initial session was completed both control and prevention participants returned to complete follow-up symptom ratings.

Data Analysis

Separate Univariate Analyses of Covariances (ANCOVA) were used to evaluate the moderation of the effectiveness of the CBASP based early intervention program by past MDD, PTSD, Panic Disorder, Social Phobia, Specific Phobia, GAD, suicide risk, insomnia, and disturbing dreams and nightmares. Within each ANCOVA the dependent variable was the time 2 measure (e.g., BDI depressive symptoms) with the corresponding time 1 measure entered as the covariate to account for the stability of the construct over time. The independent variables within each ANCOVA were group membership (intervention versus control program exposure) and each of the potential moderator variables. The influence of the moderator on the effectiveness of the program is identified through the interaction term. For all significant interactions, the simple effect of the treatment program at each level of the moderator was examined. This allows us to determine whether the program is differentially effective at different levels of the moderator variable. It is important to note that the general efficacy of the current prevention program for the symptom reduction has been addressed and supported elsewhere (Cukrowicz & Joiner, 2007) and will not be discussed here.

Results

A summary of the ANCOVA results can be found in Table 1. The overall pattern of results indicated that the early intervention program was less effective in reducing depressive symptoms for those with insomnia; less effective in reducing negative affect for those with insomnia or suicide ideation; and less effective in reducing anxiety for those with PTSD.

The effectiveness of the early intervention program on symptoms of depression as measured by the BDI was moderated by only one of the nine potential moderators investigated. Specifically, there was a significant interaction between insomnia at time 1 and group, $F_{(1, 150)} = 9.861, p < .05$. Analysis of the simple effect of group at each level of insomnia demonstrated that those individuals in the early intervention group demonstrated lower levels of depression at time 2 than those in the control group, but only for those with little or no problems with insomnia, $F_{(1, 127)} = 27.228, p < .05$ (see Table 2). There was no difference between those individuals in the early intervention and control groups who demonstrated clinical insomnia, $F < 1$.

The effectiveness of the early intervention program on symptoms of anxiety as measured by the BAI was moderated by only one of the nine potential moderators investigated. There was a significant interaction between group and PTSD symptoms at time 1, $F_{(1, 159)} = 9.507, p < .05$. Analysis of the simple effects of group at each level of PTSD resulted in a significant effect of group for those who did not meet criteria for PTSD at time 1, $F_{(1, 154)} = 7.574, p < .05$. Specifically, those individuals in the early intervention group experienced lower levels of anxiety at time 2 than those in the control group, but only when they did not meet criteria for PTSD at time 1 (see Table 3). There was not a significant difference between control and intervention participants who met criteria for PTSD at time 1, $F_{(1, 4)} = 7.017, p > .05$.

The effectiveness of the early intervention program on general distress or negative affectivity as measured by the NA scale of the PANAS was moderated by three of the nine potential moderators; though one of these was only marginally significant. There were significant interactions between the effects of group and Social Phobia at time 1, $F_{(1, 159)} = 4.560$, $p < .05$, between group and suicide risk status at time 1, $F_{(1, 160)} = 7.912$, $p < .05$, and a marginally significant interaction between group and insomnia at time 1, $F_{(1, 150)} = 3.838$, $p = .052$. Analysis of the simple effects of group at each level of Social Phobia indicated that participants in the intervention group demonstrated lower levels of negative affectivity at time 2 than those in the control group, but only for those who met criteria for social phobia at time 1, $F_{(1, 85)} = 4.669$, $p < .05$ (see Table 6). There was no difference in NA at time 2 for those who did not meet criteria for Social Phobia, $F < 1$.

Simple effects analysis of group at each level of suicide risk indicated that there was a marginally significant effect of group for those participants who were designated to be at low risk for suicide, $F_{(1, 148)} = 3.522$, $p = .063$. Specifically, participants in the early intervention program demonstrated lower levels of NA at time 2 than those in the control group, but only for those exhibiting low risk for suicide (see Table 7). There was no difference between groups when participants were at relatively higher risk for suicide, $F_{(1, 11)} = 3.548$, $p > .05$.

The simple effects analysis of group at each level of insomnia indicated that there was a marginally significant interaction that was driven by the marginally significant difference between groups for those individuals without significant difficulties with insomnia, $F_{(1, 127)} = 3.234$, $p = .074$. Specifically, participants in the intervention group demonstrated somewhat lower levels of NA at time 2 than those in the control group for participants with no significant insomnia difficulties (see Table 2). The simple effect of group for those individuals experiencing clinical insomnia was not significant, $F < 1$.

Discussion

The current study attempted to examine the influence of past MDD, specific anxiety disorders, suicide ideation, and sleep difficulties related to insomnia and disturbing dreams and nightmares on a CBASP based early intervention program for sub-threshold symptoms of depression and anxiety in college students. In general, it was expected that the presence of symptoms of the various moderators explored would result in less of a benefit from the program. This was demonstrated for only a few of the moderators and outcome variables explored. Specifically, for depressive symptoms as measured by the BDI, anxiety symptoms as measured by the BAI, and symptoms of negative affect, the program was less effective (i.e., participants demonstrated comparable scores to control participants) when they experienced insomnia (for depression and negative affect), PTSD (for anxiety), or suicide ideation (for negative affect), respectively. Conversely, when participants in the intervention group did not experience these problems, they demonstrated lower levels of depression, anxiety, or negative affect, respectively, compared to the control group.

While this study was primarily exploratory in nature, there are a number of explanations for these findings. In general, the presence of such symptoms may be indicative of greater risk

or baseline levels of depression, anxiety, and negative affect. While the use of ANCOVA attempts to correct for over-time stability of these outcomes, this is not a full proof method. Only with a longitudinal design with a greater number of assessment points would we be able to more fully account for the stability of the construct (cf., Smith & Mumma, 2008). Therefore, it is possible that individuals experiencing insomnia, PTSD symptoms, and/or suicide ideation present a greater risk for later distress and, therefore, require more intensive or focused early intervention to inhibit symptom progression.

Such programs may require a greater number of sessions, a more individualized format compared to the computer based CBASP program used here, or a program that highlights the role of the specific moderator variable. For example, an early intervention program aimed at sub-threshold symptoms of general negative affect in college aged individuals might consider pre-program assessment of suicide ideation and insomnia. For group members demonstrating such symptoms, it might be advisable to include additional components that address these issues specifically (e.g., a sleep hygiene education component). As such, modifications to the existing program may enhance the effectiveness for individuals experiencing these symptoms.

While these results were generally consistent with our, albeit exploratory, expectations, there were some results that were contrary to our predictions. Specifically, the early intervention program resulted in lower symptoms of negative affect when participants experienced symptoms of Social Phobia. At first glance, this is an odd finding. Specifically, our participants experienced a greater benefit from the CBASP influenced program *only* when they also experienced Social Phobia. There are a couple of possible explanations for this. It may be that this reflects the particular relevance of the content of the intervention. The interpersonal nature of the intervention and the explicit training in methods to effectively obtain desirable outcomes in situations may be particularly beneficial to those with Social Phobia who may otherwise feel lost or impaired by anxiety in these situations. Furthermore, individuals experiencing symptoms of Social Phobia may have been more receptive to the program's principles and more likely to implement the methods described. For example, a college aged individual who may not be currently anxious or generally distressed, but experiences some social anxiety may be highly receptive to learning principles that, as discussed, are highly relevant to such a problem and would, therefore, receive subsequent benefit from the program relative to anxiety. Furthermore, it is also important that such problems might not be overly distressing to the point of interfering with the program's effectiveness. This seems a logical explanation given the comparatively less severe or serious nature of these *enhancing* moderators (i.e., Social Phobia) and those found to moderate the program's effectiveness in the negative direction (i.e., PTSD, insomnia, and suicide ideation). Regardless of whether these variables might somehow enhance the potential benefit of such an early intervention program, it is important to acknowledge that they, at the very least, do not seem to interfere with its effectiveness.

While these results offer some input in how we design and implement early intervention programs for sub-threshold symptoms, the current study does suffer from some limitations. Most notable was the lack of significant results for a large proportion of the moderators explored. Additionally, it is important to acknowledge that this study was primarily

exploratory in nature and involved a large number of analyses; potentially inflating type I error. While we acknowledge this as a potential limitation, we argue that the low numbers of individuals experiencing difficulties consistent with our moderator variables involved an inherent reduction in power. This, of course, is most adequately addressed via replication of these results.

In addition to replication of these results, future research should attempt include greater numbers of individuals experiencing difficulties consistent with these symptoms level moderators. Specifically, only by increasing the number of individuals with sub-threshold symptoms of depression and anxiety and who have a past history of MDD, current suicide ideation, etc. will we be able to balance power and increase the reliability of the results. Future research should also continue to include symptom level moderators in the examination of the differential effectiveness of early intervention programs. Additionally, it may be helpful to enhance the specificity with which such moderators are assessed in order to potentially identify levels at which certain moderators might be preventive of benefit versus those that might enhance potential benefit. Lastly, future research should begin exploring the effectiveness of programs that are similarly brief (i.e., two hours) compared to longer, more intensive programs. As discussed previously, participants are more likely to complete shorter programs. However, it is important to balance brevity with effectiveness; especially the context of complicating variable such as suicide ideation and insomnia.

Regardless of these potential limitations, these data support Horowitz and Garber's (2006) call for greater attention to moderator variables in early intervention (or prevention) program research. Furthermore, these data suggest that such examinations go beyond standard demographic variables such as age, sex, and ethnicity and include symptom level variables such as suicide ideation and insomnia.

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Table 1

Summary of ANCOVA Results for all Dependent Variables by Each Moderator.

BDI	BAI	PANAS NA
Grp	$F_{(1, 160)} = 1.89$	$F_{(1, 160)} = 2.81$ Grp
Past MDD	$F_{(1, 160)} = .014$	$F_{(1, 160)} = .03$ Past MDD
Grp X Past MDD	$F_{(1, 160)} = .02$	$F_{(1, 160)} = .19$ Grp X Past MDD
Grp	$F_{(1, 159)} = 14.35^{***}$	$F_{(1, 159)} = 11.89^{**}$ Grp
GAD	$F_{(1, 159)} = 1.87$	$F_{(1, 159)} = 7.48^{**}$ GAD
Grp X GAD	$F_{(1, 159)} = .04$	$F_{(1, 159)} = .78$ Grp X GAD
Grp	$F_{(1, 159)} = 12.99^{***}$	$F_{(1, 159)} = 6.23^*$ Grp
Panic Disorder	$F_{(1, 159)} = .00$	$F_{(1, 159)} = 2.10$ Panic Disorder
Grp X Panic Do	$F_{(1, 159)} = 1.63$	$F_{(1, 159)} = .14$ Grp X Panic Do
Grp	$F_{(1, 159)} = 15.95^{***}$	$F_{(1, 159)} = 11.20^{**}$ Grp
Social Phobia	$F_{(1, 159)} = 1.35$	$F_{(1, 159)} = 3.35$ Social Phobia
Grp X Soc. Phobia	$F_{(1, 159)} = .02$	$F_{(1, 159)} = 1.20$ Grp X Soc. Phobia
Grp	$F_{(1, 159)} = 15.29^{***}$	$F_{(1, 159)} = 9.57^{**}$ Grp
Specific Phobia	$F_{(1, 159)} = .52$	$F_{(1, 159)} = .02$ Specific Phobia
Grp X Spec. Phobia	$F_{(1, 159)} = 1.21$	$F_{(1, 159)} = 1.67$ Grp X Spec. Phobia
Grp	$F_{(1, 159)} = 7.27^{**}$	$F_{(1, 159)} = 17.79^{***}$ Grp
PTSD	$F_{(1, 159)} = .81$	$F_{(1, 159)} = 8.46^{**}$ PTSD
Grp X PTSD	$F_{(1, 159)} = 1.55$	$F_{(1, 159)} = 9.51^{**}$ Grp X PTSD
Grp	$F_{(1, 160)} = .69$	$F_{(1, 160)} = 4.50^*$ Grp
Suicide Risk	$F_{(1, 160)} = .06$	$F_{(1, 160)} = .75$ Suicide Risk
Grp X Suicide Risk	$F_{(1, 160)} = 1.96$	$F_{(1, 160)} = .21$ Grp X Suicide Risk
Grp	$F_{(1, 150)} = .93$	$F_{(1, 150)} = 2.86$ Grp
Insomnia	$F_{(1, 150)} = 4.73^*$	$F_{(1, 150)} = 1.29$ Insomnia
		$F_{(1, 150)} = .31$
		$F_{(1, 150)} = 2.97$

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BDI		BAI		PANAS NA	
Grp X Insomnia	$F_{(1,150)} = 9.86^{**}$	Grp X Insomnia	$F_{(1,150)} = .87$	Grp X Insomnia	$F_{(1,150)} = 3.84$
Grp	$F_{(1,150)} = 2.96$	Grp	$F_{(1,150)} = .02$	Grp	$F_{(1,150)} = .90$
Nightmares	$F_{(1,150)} = 1.78$	Nightmares	$F_{(1,150)} = .03$	Nightmares	$F_{(1,150)} = .00$
Grp X Nightmares	$F_{(1,150)} = .05$	Grp X Nightmares	$F_{(1,150)} = 1.52$	Grp X Nightmares	$F_{(1,150)} = 2.33$

Note: BDI=Beck Depression Inventory, BAI=Beck Anxiety Inventory, NA=Negative Affectivity, Grp=Group, MDD=Major Depressive Disorder, GAD=Generalized Anxiety Disorder.

Table 2

Means and Standard Deviations of Time 1 & Time 2 Depression, Anxiety, Negative Affectivity Scores by Group & Moderator Variables at Time 1.

			BDI		BAI		NA	
			Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
No Insomnia	Intervention Group (n=67)		6.19 (4.28)	4.06 (4.30)	6.97 (4.74)	4.43 (4.13)	15.78(4.00)	14.69 (4.65)
	Control Group (n=63)		7.16 (4.44)	8.08 (4.24)	8.57 (4.75)	8.02 (6.61)	16.21(4.19)	16.24(4.63)
Insomnia	Intervention Group (n=12)		11.42 (3.85)	10.92 (6.05)	9.25(5.31)	7.92 (4.96)	21.08(5.20)	20.50 (6.26)
	Control Group (n=13)		8.23 (4.71)	7.69 (3.20)	10.85 (4.08)	9.69 (4.57)	17.77 (5.29)	16.69(4.15)
No PTSD	Intervention Group (n=84)		6.82 (4.49)	5.36 (5.52)	7.24(4.79)	4.95 (4.39)	16.67 (4.64)	15.51 (5.48)
	Control Group (n=73)		7.34 (4.55)	8.08 (4.18)	8.93 (4.72)	7.88(5.83)	16.38(4.33)	16.10 (4.38)
PTSD	Intervention Group (n=4)		12.75 (4.03)	4.75 (2.50)	13.50 (3.70)	8.75 (3.86)	20.75 (7.41)	21.75 (4.50)
	Control Group (n=3)		7.33 (2.31)	8.67 (3.79)	10.33 (5.13)	18.67 (10.12)	17.00 (5.29)	20.33 (5.86)
No Specific Phobia	Intervention Group (n=50)		6.80 (4.82)	5.30 (5.54)	7.24(5.05)	4.52 (4.23)	16.80(4.62)	15.82 (5.70)
	Control Group (n=38)		7.11(4.52)	7.37 (3.36)	8.39 (4.38)	8.32(6.17)	15.97 (3.82)	15.84 (4.02)
Specific Phobia	Intervention Group (n=38)		7.47 (4.37)	5.37 (5.31)	7.89 (4.75)	5.92 (4.59)	16.92(5.12)	15.76 (5.47)
	Control Group (n=38)		7.58 (4.47)	8.84 (4.73)	9.58(4.50)	8.29(6.53)	16.84(4.81)	16.68 (4.91)
No Disturbed Dreams & Nightmares	Intervention Group (n=73)		6.47 (4.29)	5.04 (5.34)	7.03 (4.80)	4.58(4.28)	16.18(4.30)	15.18 (5.23)
	Control Group (n=74)		7.22 (4.44)	8.00 (4.05)	8.81(4.65)	8.26(6.39)	16.35 (4.39)	16.34 (4.59)
Disturbed Dreams & Nightmares	Intervention Group (n=6)		13.33 (3.50)	5.83 (2.99)	10.83 (4.54)	9.67 (3.44)	21.50(5.43)	20.33(4.13)
	Control Group (n=2)		12.00 (4.24)	8.50 (6.36)	14.50 (3.54)	10.00 (0.00)	21.00(0.00)	15.50 (0.71)
No Social Phobia	Intervention Group (n=37)		5.73 (4.48)	4.16 (4.69)	5.97 (4.65)	3.84(3.68)	15.14(3.25)	15.46 (5.53)
	Control Group (n=39)		7.26 (4.49)	7.72 (3.88)	8.21(4.55)	6.82(5.53)	15.92 (4.44)	15.00 (3.97)
Social Phobia	Intervention Group (n=51)		8.08 (4.50)	6.18 (5.78)	8.65 (4.82)	6.06 (4.70)	18.10(5.38)	16.04 (5.64)
	Control Group (n=37)		7.43 (4.51)	8.51 (4.41)	9.81(4.78)	9.86(6.77)	16.92 (4.22)	17.59 (4.65)
Low Suicide Risk	Intervention Group (n=78)		6.29(4.16)	4.72 (4.92)	7.05 (4.68)	4.76 (4.34)	16.27(4.11)	15.14 (4.91)
	Control Group (n=73)		7.15 (4.26)	8.06 (4.20)	8.86 (4.68)	8.16(6.27)	16.31(4.11)	16.49 (4.57)
High Suicide Risk	Intervention Group (n=10)		13.30 (3.09)	10.10(6.90)	11.20 (5.35)	8.00(4.11)	21.40(7.29)	20.90 (7.84)
	Control Group (n=4)		12.00 (6.48)	8.75 (2.22)	11.25 (4.57)	11.50 (6.45)	19.75 (8.02)	13.75 (2.36)
No GAD	Intervention Group (n=57)		6.19 (4.64)	4.61 (5.08)	6.42 (4.56)	3.98(3.75)	15.91(3.88)	15.16 (4.95)
	Control Group (n=47)		5.94 (4.23)	7.02 (3.33)	7.43 (4.35)	6.38(5.02)	15.40(3.40)	14.81 (3.03)
GAD	Intervention Group (n=31)		8.74(4.15)	6.65 (5.82)	9.55 (4.94)	7.23 (4.82)	18.58(5.86)	16.97 (6.48)

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	BDI		BAI		NA	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Control Group (n=29)	9.62 (3.92)	9.86 (4.74)	11.52(4.17)	11.41 (7.01)	18.03(5.18)	18.62 (5.41)

Note: BDI=Beck Depression Inventory, BAI=Beck Anxiety Inventory, NA=Negative Affectivity, PTSD=Post-Traumatic Stress Disorder.