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Thought Suppression and Mindfulness: A Randomized Controlled Study

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The results of a different analysis related to self-compassion from the same study were reported in a previous publication by Richards and Martin (2012).

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Abstract

The objective of this study was to examine the impact of a brief mindfulness intervention on the constructs of mindfulness and thought suppression with undergraduates. The brief mindfulness intervention was comprised of both instructive and hands-on exercises that were manualized in a protocol. A randomized experimental design was utilized in this study. The independent variable (treatment) was deliberately manipulated and the dependent variables were assessed. A no treatment waiting-list control group was used. The 34 participants were randomly assigned to the two conditions and the assignment of treatment condition to groups was done randomly. The results of the study suggested that mindfulness could be increased while thought suppression could be decreased through the use of the brief intervention. This research is particularly meaningful since typical mindfulness interventions are of a longer duration.

Introduction

Research supporting the efficacy and effectiveness of mindfulness and its applications to mental health has developed over the past decade. There has been an interest in determining if mindfulness can be cultivated and if this cultivation leads to well-being (Chambers, Gullone & Allen, 2009). Research related to the coping construct of thought suppression has shown that decreased thought suppression can improve well-being (Barnes, Klein-Sosa, Renk, & Tantleff-Dunn, 2010). Moreover, decreased thought

suppression can be accomplished through the cultivation of mindfulness (Hepburn et al., 2009).

Mindfulness interventions are adapted from the 2,500 year old Buddhist tradition. In Buddhism, Right Mindfulness is about bringing your awareness into the present moment. It is a part of the eightfold path, which is a Buddhist guide for ethical and moral development (Kabat-Zinn, 1990). Though mindfulness has its origins in Buddhism, it is a concept that has cross-cultural applications. The mindfulness emphasis on experiential reality rather than on cultural constructs or informational content makes the construct relevant in many contexts (Baer, 2003). According to Baer (2003), mindfulness techniques can be taught in the context of Western mental health without reliance on Buddhist spiritual teachings. Mental health practitioners have taken steps in order to separate the religious context from the clinical training of clients (Dimidjian & Linehan, 2003). In Western mental health, mindfulness has been adopted as an approach to help clients increase awareness and to respond skillfully to mental processes that contribute to emotional distress and maladaptive behavior (Bishop et al., 2004).

Mindfulness interventions usually include the practice of multiple mindfulness methods (Baer, 2003). One method is intentionally paying attention to present moment reality with a focus of acceptance and curiosity cultivated by non-evaluative observation. In theory, when one's attention has wandered from this orientation, attention is reoriented to a more flexible and open state of awareness. Unlike relaxation techniques, which are expressly used to reduce undesirable conditions of body and mind, mindfulness methods create conditions for acceptance and put the practitioner in touch with the multiple experiences and layers of self. Tolerance of distress when distress can be reduced without negative consequences is not advocated. Mindfulness interventions do suggest that unpleasant cognitions, emotions, and sensations are an inevitable part of life that cannot always be avoided and skillful acceptance of such experiences may be important to mental health. For example, the mindful observation and acceptance of an angry mood is not intended to keep an individual immersed in anger but is intended to bring about a thoughtful choice of an action to take or to allow the anger to run its course without the individual engaging in escape and avoidance behaviors (Baer & Huss, 2008).

Thought suppression is defined as a mental control strategy that is the process of deliberately trying to stop thinking about certain thoughts. Thought suppression has been documented as being related to an increased experiencing of psychological symptoms including depression, anxiety as well as addictions (Rassin, 2003). Hepburn et al. (2009) stated that undergraduate college students who utilized thought suppression were more likely than those who did not to experience depressive symptoms over time and especially after stressful experiences. Wegner, Schneider, Carter, and White (1987) were the first to experimentally document that individuals have great difficulty suppressing their thoughts and that the purposeful suppression of unwanted thoughts paradoxically results in even more unwanted thoughts. In their study, participants who were instructed to suppress thoughts about a white bear were unsuccessful at completely suppressing the target thought (the white bear) and a rebound in target thoughts after a designated suppression period was reported (Wegner et al., 1987). Thus, purposeful thought suppression appears to be an ineffective method of controlling unwanted thoughts. An inability to suppress thoughts may be related to worsening of psychological symptoms. Thought suppression is considered to be an inadequate mental control strategy (Rassin,

2003). Learning to accept the experience of unwanted thoughts and refraining from using thought suppression may promote more beneficial outcomes for individuals (Barnes et al., 2010). Because mindfulness encourages non-judgmental acceptance of present moment experiencing, it is hypothesized to decrease thought suppression (Hepburn et al., 2009). Wegner and Zanakos (1994) point out that when people are instructed to suppress thoughts, sensitivity to these thoughts appears to heighten emotionality. Further, the suppression of thoughts does not allow the person to become habituated to the thoughts and thus lessen their emotional impact. Reports of chronic thought suppression are related to reports of obsession and expressions of negative affect such as depression and anxiety. It is suggested that suppression promotes a dishabituation or relative elevation of emotional response to that thought (Wegner & Zanakos, 1994). Systematic mindfulness practice can gradually erode patterns of habitual responding, as mindfulness explicitly teaches individuals to work with difficult emotions and thoughts and to develop increased self-awareness (Chambers et al., 2009).

The purpose of this study was to assess the extent to which mindfulness can be increased and thought suppression decreased in a randomized group of undergraduate college students using an innovative brief form of a mindfulness intervention compared to randomized participants in a waiting list control.

This research is meaningful since typical mindfulness training programs are of a longer duration, usually 90 minutes a week for 8 weeks. If a brief mindfulness intervention is a viable option for increasing mindfulness and self-compassion as well as decreasing thought suppression with a sample of undergraduate college students, it has potential implications for colleges' and universities' implementation of wellness and stress reduction programs. A brief intervention requires less financial and time resources. A brief intervention would also be more agreeable to undergraduate students' schedules.

Method

Participants

Participant enrollment and assignment procedures. Recruitment occurred through a campus advertisement and follow-up phone interviews. The sample consisted of 47 participants who were randomly assigned to two groups of participants. Then the two groups were randomly assigned to receive either the treatment or the control condition of no treatment, the waiting-list condition. There were 23 participants in the treatment condition and 24 in the control condition of no treatment. Thirteen participants dropped out of the study, leaving 16 participants in the treatment condition and 18 in the control condition of no treatment. Eight participants dropped out before the intervention began but after random assignment occurred, and five participants in the control group did not complete the second week of treatment due to personal emergencies. This led to an unequal number of participants in each group. A \$50 stipend was provided to participants for their participation in the project. A \$25 stipend was provided to the five participants in the control group who did not complete the second week of treatment. The principle investigator provided the mindfulness interventions and the assessment activities.

Characteristics of participants and group differences analyses. There were 34 undergraduate students who participated in the study. The treatment group was comprised

of 16 participants and there were 18 persons in the control group. All participants were randomly assigned to a condition group.

The mean age of the treatment group was $M = 19.75$ ($SD = 1.48$) and the control group was $M = 21.72$ ($SD = 10.30$). The control group had a participant who was 62 years old. There was no significant difference in age between the treatment and control groups, $t(32) = -.76, p > .05$. In the treatment group, 94% were females, and 78% of the control group were females; there was no significant difference of gender between the experimental and control group, $\chi^2(1, N = 34) = 1.72, p > .05$. The number of participants in ethnocultural groupings by (treatment, control) was Black (3, 1), White (11, 12), Latino (0, 4), and multi-heritage (2, 1). There was no significant difference between the treatment and control groups based upon ethnocultural groupings, $\chi^2(3, N = 34) = 5.28, p > .05$. The frequencies of treatment group participants by class standing was first year (5), sophomore (4), junior (3), and senior (4), compared to the control group first year (10), sophomore (2), junior (3), and senior (3). There was no significant difference between participants in the treatment and control groups in class standing, $\chi^2(4, N = 34) = 3.90, p > .05$. There were seven participants in the treatment group who were first generation students compared to four students in the control group, and this frequency difference was not significantly different across the treatment and control groups, $\chi^2(1, N = 34) = 1.79, p > .05$. The random assignment was successful in equalizing the groups on the preceding selected characteristics.

Procedures

Research design and interventions. A randomized pretest-posttest control group design with added treatment for the waiting-list control group was implemented. The brief mindfulness intervention was comprised of both instructive and hands-on exercises that were manualized into a protocol. The mindfulness activities were inspired from the mindfulness teachers Thich Nhat Hanh (2004), Jack Kornfield (2008), Pema Chodrin (2010), and Sharon Salzberg and Joseph Goldstein (1996). All of the guided meditations used in the study were influenced by Sharon Salzberg and Joseph Goldstein (1996). The 2-week brief mindfulness intervention had three phases: (1) first, a 5-hour in-person group intervention, (2) every other day online booster treatments and diaries, and (3) a second 5-hour in-person group intervention.

The group intervention included: (a) individual introductions, (b) an overview presentation of the training schedule, (c) an introduction to mindfulness, (d) practice in guided sitting mindfulness, exercise, and eating mindfulness, (e) mindfulness role in stress reduction and the relationship between thoughts, feelings, and behaviors, (f) instruction in Lovingkindness mediation instruction, and (g) directions on how to complete the online diary and online booster treatments throughout the week.

The online booster treatments consisted of homework activities that assisted participants in practicing mindfulness techniques independently. The booster treatments were emailed to participants every other day throughout the week. Online diaries were used for participants to record daily mindfulness practices. The participants reported the types of mindfulness practices they completed that day (e.g., mindfulness walking, mindful eating) and how long they practiced. They also reported on thoughts and feelings they were experiencing before each practice, what thoughts and feelings came up during the practice, and what changed after the practice.

The second 5-hour group intervention followed the same format as the first group intervention with a few minor differences. The stress reduction activities were replaced with conflict resolution activities. Additionally, suggestions on incorporating formal practices into daily living activities were explored.

The brief mindfulness intervention group and the waiting-list control group participants were assessed at the same time prior to the intervention and after the 2 weeks of intervention on all of the outcome measures. When the 2 week intervention and assessment was completed, the waiting-list control group participants received the brief brief-mindfulness intervention and follow-up assessment (Richards & Martin, 2012).

Measures

Two outcome variables used in this study were mindfulness and thought suppression. The instruments used to measure each dependent variable are discussed along with the demographic survey used in the study.

Mindfulness. Mindfulness skills were assessed using the Five Facet Mindfulness Questionnaire (FFMQ). The FFMQ is a 39-item measure consisting of five subscales (observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience). Higher scores reflect greater mindfulness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). In this study, the Cronbach alpha coefficients showed good internal consistencies: Total = .93, Observing = .82, Describing = .92, Act with Awareness = .92, Nonjudging = .94, and Nonreacting = .81.

Thought-suppression. Thought suppression was measured using the White Bear Thought Suppression Inventory (WBSI). The WBSI measures a person's tendency to suppress thoughts. Higher scores on the WBSI indicate greater tendencies to suppress thoughts (Wegner & Zanakos, 1994). The total WBSI Cronbach alpha coefficient in this study was .91.

Demographic Questionnaire. The researchers of this study developed a psychological-social-educational-health report form that was used to assess personal characteristics relevant to the study. These characteristics included gender, ethno-cultural background, and year in their undergraduate program. The participants were also asked to report their level of involvement in religion and on/off campus clubs, as well as a rating of physical and emotional health, stress concerning degree completion and interpersonal relationships. Additionally, the participants were asked to report whether they had been diagnosed with an emotional or behavioral disorder, received previous psychological counseling, and if they were currently taking medication.

Statistical Analyses

Data were screened for accuracy, missing data, and adherence to the underlying assumptions of parametric analysis. Descriptive statistics were computed of the dependent measures for the brief mindfulness and waiting-list control conditions. Pretest-posttest gain scores of the participants were generated and compared across the brief mindfulness and waiting-list control using analyses of variance. Partial eta-squared (η^2_p) values were calculated to show magnitude of treatment effect. Observed power values were computed to assess the stability of the findings.

Results

Data screening was conducted to assess whether the dependent variables met the underlying assumptions of normality, homogeneity of variance, and independence of observations across the conditions. An alpha criterion of $\alpha = .05$ was used to test the null hypotheses in this study. The screening, ANOVA, effect sizes, and observed power results are presented next in relation to the dependent variables.

Mindfulness

The construct of mindfulness is measured in this study using the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). The FFMQ is comprised of 39 items using a 5-point Likert-type scale with the choice options of (1) never or very rarely true, (2) rarely true, (3) sometimes true, (4) often true, (5) very often or always true. High scores on sub-scales represent more mindfulness. There are five sub-scales of the FFMQ labeled Observing, Describing, Acting with Awareness, Nonjudging, and Nonreacting.

There were no univariate outliers among the case scores on the dependent variables. The preponderance of evidence supported that the dependent variables by condition met the underlying assumption of normality. The analysis of the dependent variable Nonreacting showed that the error variances between the treatment and control groups did not meet the homogeneity of error variance assumption. As such, a Welch procedure was performed and used in the interpretation of the ANOVA finding. There were no linear trends between paired scores across the groups for each dependent variable indicating that the assumption of independence of observations was met.

The treatment and control groups were equivalent on the FFMQ total scale pretest scores, $F(1, 32) = 1.22, p > .05$. The one-way ANOVA results of pre-post gain score mean differences between the treatment and control groups showed that the treatment group participants reflected significantly higher mindfulness scores than did the control group on all FFMQ scales ($p < .05$) except for the Describing scale, $p > .05$ (see Table 1). The magnitude of treatment effect of the Describing scale was medium, while all other FFMQ scales reflected large treatment effects. The observed power for the FFMQ total score was .998 providing support for the stability of this finding in future similar samples, settings, alpha criterion, and effect sizes.

Suppression of Thoughts

The White Bear Suppression Inventory (WBSI) is a tool to measure the extent that individuals are suppressing thoughts such as avoiding unwanted thoughts (Wegner & Zanakos, 1994). A total score is obtained from 15 items using a five point Likert-type scale ranging from (1) Strongly Disagree, (2) Disagree, (3) Neutral or Don't Know, (4) Agree, and (5) Strongly Agree. Higher scores represent higher perceived thought suppression.

The data screening showed that the total score on the WBSI met the underlying assumptions of normality and independence of observations. However, the assumption of homogeneity of variance was not met and a Welch procedure was used. There was no significant difference between the treatment and control groups on thought suppression at pretest ($p > .05$). The one-way ANOVA with a Welch procedure results of the pre-post gain score mean difference between the treatment and control groups showed that the

treatment group participants had significantly lower thought suppression scores when compared to the control participants, $F(1, 32) = 11.81, p < .01, \eta^2_p = .28$.

Table 1

FFMQ Pretest-Posttest Gain Score Mean Differences, Standard Deviations, and Effect Sizes Across the Conditions

	Treatment (n= 16)		Control (n= 18)		Effect Sizes ¹ η^2_p
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Observing	-.45	.51	-.07*	.40	.16
Describing	-.38	.66	-.06 ^{NS}	.57	.07
Acting with Awareness	-.52	.59	.01**	.50	.19
Nonjudging	-.76	.87	.26**	.81	.28
Nonreacting	-.72	.72	-.07**	.48	.24
Total FFMQ	.57	.40	.01***	.28	.43

¹These partial eta-squared values are from the ANOVA analyses. Cohen's (1977) effect size criteria for η^2_p is small = .01, medium = .06, and large = .14. ^{NS}Not Significant, * $p < .05$, ** $p < .01$, *** $p < .00$

The pretest mean for the treatment group was $M = 3.55 (SD = .65)$ and the mean thought suppression decreased following the brief mindfulness treatment to $M = 2.65 (SD = .65)$. The control group participants' pretest mean ($M = 3.62, SD = .67$) and posttest mean ($M = 3.52, SD = .72$) remained relatively constant for the control group. The .95 confidence interval of the mean difference (.80) between the control group and the treatment group across pretreatment and post-treatment combined produced a $CI_{\text{lower bound}} = .34$ and a $CI_{\text{upper bound}} = 1.26$. The brief mindfulness intervention produced a large treatment effect on reducing thought suppression of the participants in the treatment group compared to the control group. The observed power was .933 providing evidence for the stability of this finding in future similar samples, settings, alpha criterion, and effect sizes.

Discussion

Summary and Explanation of Results

Overall, the results show that the brief mindfulness intervention produced significant effects in increasing mindfulness while decreasing thought suppression of the treatment participants compared to the control group members. The findings provide initial support for using a brief mindfulness intervention of 2 weeks with online treatment boosters and diaries.

Pre and post data on the constructs of mindfulness and thought suppression were collected. In the first hypothesis, it was anticipated that there would be an increase in mindfulness scores as measured by the Five Facet Mindfulness Questionnaire among undergraduate students after receiving a brief mindfulness intervention when compared to a waiting-list control condition. This hypothesis was supported. The results reflected significantly higher mindfulness pre-post gain scores on all of the FFMQ scales, except

for the Describing Scale, for the undergraduate students receiving a brief mindfulness intervention when compared to a waiting-list control condition.

Describing involves the ability to label internal experiences with words. Theoretically, the teaching of mindfulness, as taught through the brief intervention, should have increased the ability to label internal experiences with words among the participants. It is possible that a brief intervention is not long enough to impact this construct. It is also possible that the relationship of Describing to mindfulness is different than has been theorized.

It was expected in the second hypothesis that the brief mindfulness intervention would reduce thought suppression when compared to a non-treatment control condition. The alternative hypothesis was supported. There was a significant reduction in thought suppression as measured by the White Bear Thought Suppression Inventory among undergraduate students after receiving a brief mindfulness intervention when compared to a waiting-list control condition.

Limitations

The principle investigator administered the intervention. Replications using single, double, and triple blinded studies are warranted. The participants were paid for their participation in the study. This is reflective of the potential extrinsic motivation of students to participate. How many students would be interested in participating had there not been a financial incentive is a consideration. Also, it is possible that the financial incentive created a potential motivation interaction effect with the intervention that might produce different results on the dependent variable than participants who had no financial incentive.

Another potential limitation of this study relates to dependent variables being measured using participants' self-reports. The instruments used in this study are self-report measures, and misinterpretation of the items, response bias, and an unwillingness to answer specific questions causing missing data may have occurred. Using measures of social desirability in future research would provide some insight into one aspect of response bias.

Finally, the small sample size in the study may limit generalizability of the findings to relevant target populations, settings, and procedures. However, the effect sizes for the total FFMQ and WBSI were large and the post-hoc power values reflect high probability values of correctly rejecting false null hypotheses in favor of the alternative hypotheses. Thus, there is some degree of evidence to support the generalizability of these findings in future similar studies.

Future Directions

The implementations of replication studies of this randomized control study are suggested. Additional replications of this randomized control study will help confirm the extent to which these constructs are impacted. A replication of the study where financial incentives were not offered as well as a replication of the study where the intervention was delivered by someone other than the principle investigator is recommended. It also is recommended to use follow-up post testing at regular intervals over a specified period of time. This could reveal the degree to which what was learned in the intervention was

retained by participants and the degree to which what was learned is being utilized over a longer time period.

Adding a third group intervention to the research design could offer additional information. The three groups could be the brief mindfulness condition, the waiting-list control condition, and a longer established mindfulness program condition such as Mindfulness Based Stress Reduction, Mindfulness Based Cognitive Therapy, or Acceptance and Commitment Therapy. Another line of research would be to study the brief intervention in different settings. These settings could range from community colleges to high schools to detention centers and community mental health centers. Additionally, the manualized program could be adapted to meet the needs of clients in these specific settings.

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