

Effects of Mindfulness and Positive Reappraisal on Social Approach-Avoidance Behavior in Individuals with Depressive Tendencies under Shame-Inducing Situations

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This study examined the effects of mindfulness combined with positive reappraisal on social approach-avoidance behaviors in shame-inducing situations among individuals with depressive tendencies. Sixty adults with high interpersonal vulnerability were randomly assigned to either a combined mindfulness and positive reappraisal condition or a positive reappraisal-only condition. Following shame induction and intervention, explicit and implicit approach-avoidance behaviors were assessed. Although shame decreased after the intervention in both conditions, a significant reduction from baseline was observed only in the combined condition. Participants in the combined condition showed higher explicit approach choices and preferences, along with an implicit approach tendency, whereas those in the positive reappraisal-only condition exhibited relatively greater avoidance tendencies. These findings suggest that mindfulness may reduce automatic avoidance responses and promote social approach behaviors in shame-related contexts.

Keywords: shame, mindfulness, positive reappraisal, depression, social approach-avoidance

Introduction

Depressive disorder is characterized by persistent depressed mood and a marked loss of interest or pleasure in activities (American Psychiatric Association, 2022), resulting in significant functional impairment across interpersonal, occupational, and self-evaluative domains. According to Beck's cognitive theory, depression is maintained by negative automatic thoughts that operate largely outside conscious awareness, reinforcing maladaptive behavior

and negative affect (Beck, 1963, 1964). This cognitive process distorts global self-perception and elicits negative self-evaluative emotions, among which shame is particularly salient.

Shame is a self-conscious negative emotion arising from globally negative self-evaluation (Tangney & Dearing, 2003). According to self-discrepancy theory, shame results from perceived discrepancies between the actual and ideal self (Higgins, 1987) and is associated with depressive and anxiety symptoms (Mason et al., 2019). Shame-prone individuals tend to make internal, stable, and global attributions for negative events, which intensifies self-criticism and depressive symptoms (Mills, 2005). Moreover, shame elicits withdrawal and social avoidance tendencies that restrict access to social support and positive reinforcement, thereby exacerbating depressive symptoms (Grant et al., 2013; Singh & Bhushan, 2025). Importantly, social avoidance operates not only at a conscious level but also through automatic affective responses (Geller et al., 2021), underscoring the importance of examining implicit approach-avoidance processes in shame-related contexts.

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Considering this need, positive reappraisal has been proposed as an effective emotion regulation strategy that alleviates negative emotional impact by identifying positive aspects of a given situation and reconstructing its meaning (Shiota, 2006). Evidence indicates that positive reappraisal enhances positive emotions and resilience, reduces depression, anxiety, and shame, and supports interpersonal approach motivation (Garnefski et al., 2002; McRae & Mauss, 2016; Shiota, 2006; Tracy et al., 2007; Zhao et al., 2022). However, because positive reappraisal primarily operates at a conscious, cognitive level, its effects on implicit emotional responses and behavioral tendencies may be limited. According to the Associative–Propositional Evaluation (APE) model, implicit attitudes are automatically activated through associative processes, whereas explicit attitudes rely on propositional reasoning, which may lead to dissociations between the two levels (Gawronski & Bodenhausen, 2006). Accordingly, interventions targeting implicit processes may be necessary to more effectively promote interpersonal functioning in individuals with depressive tendencies.

In this context, mindfulness has emerged as an alternative approach with the potential to influence implicit attitudes. Mindfulness is defined as the process of attending to present-moment experiences with a nonjudgmental and accepting attitude (Baer et al., 2006) and has been shown to influence emotion generation and regulation broadly, with effects that may become habitual through repeated practice (Rough & Strauss, 2024). Previous studies indicate that mindfulness reduces negative emotions, including shame, and attenuates social avoidance motivation by fostering less threatening appraisals of social situations (Brown et al., 2007; Schumer et al., 2018). Moreover, mindfulness induction has been shown to reduce implicit experiential avoidance and implicit biases, suggesting its capacity to regulate responses at the implicit level (Hooper et al., 2010; Lueke & Gibson, 2015). Accordingly, this study adopted positive reappraisal as a baseline intervention and examined the additional effects of mindfulness on explicit and implicit social approach-avoidance behaviors in shame-inducing contexts among individuals with depressive tendencies. We tested the following hypotheses: 1) Participants in the mindfulness plus positive reappraisal condition would show greater reductions in state shame compared to those in the positive reappraisal-only condition. 2) Participants in the mindfulness plus positive reap-

praisal condition would demonstrate higher levels of explicit approach behavior compared to those in the positive reappraisal-only condition. 3) Participants in the mindfulness plus positive reappraisal condition would exhibit higher levels of implicit approach behavior compared to those in the positive reappraisal-only condition.

Methods

Participants

This study was approved by the Institutional Review Board of K National University (IRB No. 2025-0437). Participants were adults aged 18 years or older recruited from the community. The sample was non-clinical and consisted of individuals with elevated depressive tendencies, defined as a K-CESD-R score of 13 or higher (Lee et al., 2016) and scores within the upper 30% on the *Away from People* subscale of the KIIP-SC (Fisher et al., 2020). As part of the screening procedure, individuals who reported current use of psychiatric medication were excluded from participation. Of the 62 eligible individuals, two were excluded due to insufficient shame induction, resulting in a final sample of 60 participants. These participants were randomly assigned to either the mindfulness plus positive reappraisal condition or the positive reappraisal-only condition ($n = 30$ per group).

Measures

Korean version of Center for Epidemiologic Studies Depression Scale–Revised (K–CESD–R)

The K-CESD-R was standardized by Lee et al. (2016) based on the original scale developed by Radloff (1977) to assess depressive symptoms. The scale consists of 20 items rated on a 5-point Likert scale from 0 to 4, assessing symptoms over the past week, with higher scores indicating greater depression. The Cronbach's alpha in this study was .94.

Short form of the Korean Inventory of Interpersonal Problems Circumplex Scales (KIIP–SC)

The KIIP-SC was constructed and validated by Hong et al. (2002) based on Horowitz et al. (1988). The scale comprises 40 items across eight subscales (Domineering, Vindictive, Cold, Socially

Avoidant, Nonassertive, Exploitable, Overly Nurturant, Intrusive) rated on a 5-point Likert scale. In this study, only the *Away from People* factor score, one of three higher-order factors (Away from People, Against People, Toward People) derived by Cho and Yoon (2019) based on Horney's (1945) theory, was used, as it captures core interpersonal avoidance tendencies theoretically relevant to social approach-avoidance behavior. In this study, the Cronbach's alpha for this factor was .92.

Korean Version of State Shame Scale (K-SSS)

To verify shame induction and post-intervention shame levels, the K-SSS was administered. The K-SSS, adapted and validated by Yu (2018) from the shame subscale of the State Shame and Guilt Scale (Marshall et al., 1994), consists of five items rated on a 5-point Likert scale, with higher scores indicating greater state shame. The Cronbach's alpha in this study was .89 at pretest, .90 at posttest 1, and .91 at posttest 2.

Shame Induction Task

To induce shame, an auditory autobiographical emotional memory task adapted from Fink-Lamotte et al. (2023) was used. Participants listened to an approximately 5-minute audio recording prompting recall of a shame-related social experience and then recorded the experience along with associated thoughts and emotions.

Mindfulness Intervention

The mindfulness induction intervention was adapted from Keng et al. (2016). Participants practiced mindfulness while listening to an approximately 7-minute guided audio recording. The original 15-minute English script was translated into Korean and condensed by simplifying repetitive instructions to enhance sustained attention in the experimental context, based on meta-analytic evidence that brief mindfulness inductions yield immediate enhancements in emotion regulation and attentional control (Leyland et al., 2019).

Positive Reappraisal Intervention

The positive reappraisal intervention was adapted from Krishnamoorthy et al. (2021). Participants were instructed to recall again the shame-related experience previously elicited during the

shame induction task and listened to an approximately 1-minute guided audio encouraging identification of positive aspects, after which they wrote about the experience and the positive meanings derived from it.

Withdrawal–approach Choice Task

Explicit social approach-avoidance behavior was assessed using a task adapted from De Hooge et al. (2018), in which participants chose between a task performed alone or with another person and then rated their preference on a continuous scale ranging from 0 (alone) to 100 (with another person), with 50 as the midpoint. The selected task was not actually performed.

Approach–Avoidance Task (AAT)

Implicit social approach-avoidance behavior was assessed using the AAT (Rinck & Becker, 2007). Neutral facial stimuli were selected from the Yonsei Face Database (Chung et al., 2019) to minimize the influence of specific emotional cues, based on ratings by seven psychology graduate students on 7-point scales assessing emotional expression intensity (how well the photo expresses neutral emotion), arousal (how emotionally arousing the photo is), and valence (how unpleasant the photo is), resulting in four photographs (two male, two female).

The AAT was developed using Visual Studio Code with reference to Kuckertz et al. (2017) and presented on a 17-inch monitor. Participants responded by pulling or pushing a joystick according to the color of the frame (blue or green) surrounding each facial stimulus, with frame–response contingencies randomly assigned and counterbalanced across participants (blue-pull/green-push or blue-push/green-pull). Pulling enlarged the stimulus, indicating an approach response, whereas pushing reduced its size, indicating an avoidance response (Figure 1). The joystick could be moved up to 30 degrees, and the stimulus disappeared once the joystick was fully pushed or pulled. A 500-ms fixation cross was presented between trials, during which participants returned the joystick to the central position. The task consisted of 20 practice trials followed by 64 experimental trials (1 emotion [neutral] $\times$ 4 actors $\times$ 2 frame colors $\times$ 8 repetitions). Reaction time was defined as the interval from stimulus onset to offset. AAT scores were calculated by subtracting mean reaction times for approach responses from

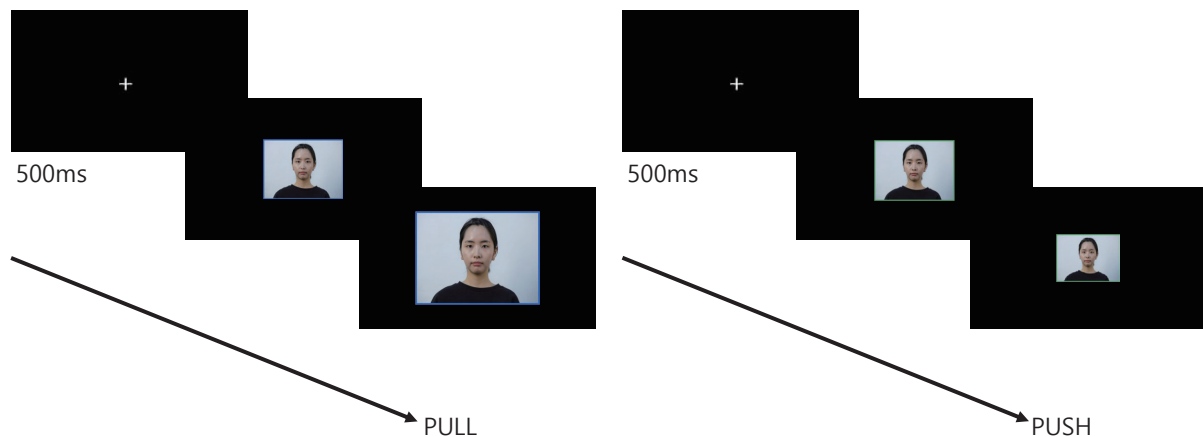


Figure 1. Example of the AAT in the blue-pull condition.

those for avoidance responses, with positive scores indicating approach tendencies and negative scores indicating avoidance tendencies. Prior to score computation, the following trials were excluded: 1) incorrect joystick movements (i.e., responses in the wrong direction), 2) reaction times that deviated more than ± 2 standard deviations from each participant's mean reaction time, 3) reaction times shorter than 500 ms or longer than 2,500 ms. To examine the internal consistency of the AAT, trials were divided into odd- and even-numbered sets, and AAT scores were calculated separately for each half. The Pearson correlation between the two halves was $r = .43$, $p < .001$. After applying the Spearman-Brown correction, the split-half reliability coefficient was $r = .60$.

Procedure

Participants first received an explanation of the study and provided written informed consent, after which they completed a baseline assessment of state shame and a shame induction task with a manipulation check. Participants in the mindfulness plus positive reappraisal condition then completed both interventions in a counterbalanced order, whereas those in the positive reappraisal-only condition completed positive reappraisal alone. State shame was reassessed after the intervention, followed by explicit and implicit social approach-avoidance tasks administered in a counterbalanced order. Finally, participants were debriefed and compensated, and residual discomfort was assessed. The entire procedure lasted approximately 40 minutes.

Statistical Analyses

Data were analyzed using IBM SPSS Statistics 29.0. Baseline equivalence between groups was examined using χ^2 tests and independent t -tests. A mixed ANOVA was conducted to test differences in shame across measurement time points by intervention condition, and χ^2 tests and independent t -tests were used to examine group differences in explicit and implicit approach-avoidance outcomes. In addition, to further examine whether between-group differences varied across outcome measures, an additional mixed-design ANOVA was conducted.

Results

Baseline Equivalence between Groups

There were no significant differences between groups in terms of gender, $\chi^2(1) = 2.783$, ns , age, $t = .206$, ns , depression, $t = .748$, ns , interpersonal vulnerability, $t = 1.318$, ns , and baseline shame, $t = -1.724$, ns (Supplementary Table 1).

Group Differences in Shame Levels Across Induction and Intervention Conditions

The main effects of measurement time and intervention condition were significant, $F(2, 116) = 42.380$, $p < .001$, and $F(1, 58) = 4.571$, $p = .037$. However, the interaction effect between measurement time and intervention condition was not significant, $F(2, 116) = .897$, $p = .410$ (Figure 2). Although the interaction effect was not significant, planned within-condition pairwise comparisons with

Bonferroni adjustment were conducted to examine changes in shame across time points. In the mindfulness plus positive reappraisal condition, shame significantly decreased from T1 to T3, $p = .028$, $d = .495$. In contrast, the positive reappraisal-only condition did not show a statistically significant reduction from T1 to T3, $p = .527$, $d = .250$. The results of the pairwise comparisons of shame levels across time points by condition are presented in Table 1.

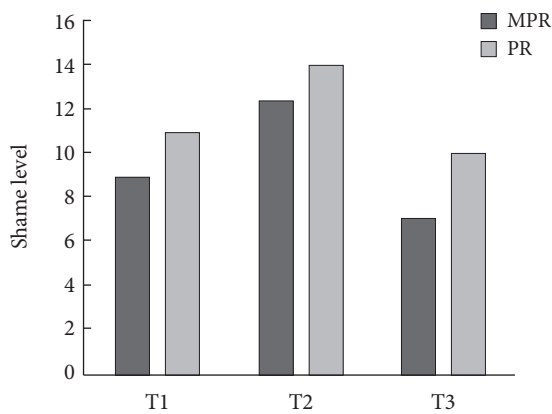


Figure 2. Shame levels across measurement time points by intervention condition.

MPR = Mindfulness plus Positive Reappraisal; PR = Positive Reappraisal Only.

T1: pre-induction baseline, T2: post-shame induction, T3: post-intervention.

Table 1. Pairwise Comparisons of Shame Levels Across Time Points by Condition

Group	Time (A)	Time (B)	Mean Difference (A-B)	SE	<i>p</i>	Cohen's <i>d</i>
MPR	T1	T2	-3.467***	.767	< .001	-.825
	T1	T3	1.900*	.705	.028	.495
	T2	T3	5.367***	.739	< .001	1.326
PR	T1	T2	-3.033***	.767	< .001	-.722
	T1	T3	.967	.705	.527	.250
	T2	T3	4.000***	.739	< .001	.988

MPR = Mindfulness plus Positive Reappraisal; PR = Positive Reappraisal Only.

* $p < .05$, *** $p < .001$.

Table 2. Frequencies and χ^2 Results for Withdrawal-approach Choices Across Intervention Conditions

Group	Avoidance	Approach	χ^2	<i>p</i>
	Frequency (within-condition %)	Frequency (within-condition %)		
MPR	20 (66.7)	10 (33.3)	9.017**	.003
PR	29 (96.7)	1 (3.3)		

** $p < .01$.

Group Differences in Explicit Approach–avoidance Behavior

Significant differences between treatment conditions were found for both withdrawal-approach choice, $\chi^2(1) = 9.017$, $p = .003$, and withdrawal-approach preference, $t = 3.458$, $p = .001$. The frequencies and χ^2 results for withdrawal-approach choice are presented in Table 2, and the means and standard deviations of withdrawal-approach preference are presented in Table 3.

Group Differences in Implicit Approach–avoidance Tendencies

Between-condition differences in AAT scores are significant, $t = 3.358$, $p = .001$. Table 3 shows the means and standard deviations of AAT scores across intervention conditions.

Group Differences in Outcome Measures

The main effects of intervention condition and outcome type, as well as the interaction effect between intervention condition and

Table 3. The Means and Standard Deviations of Withdrawal-approach Preference and AAT Scores Across Intervention Conditions

Group	MPR	PR
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Withdrawal-approach preference	38.00 (25.918)	19.50 (13.668)
AAT score	36.63 (52.303)	-7.00 (48.257)

outcome type, were all statistically significant. Because the assumption of sphericity was violated, Greenhouse-Geisser corrections ($\epsilon = .641$) were applied. The main effect of intervention condition was significant, $F(1, 58) = 15.663, p < .001, \eta^2 = .080$, and the main effect of outcome type was also significant, $F(1.281, 74.313) = 6.936, p = .006, \eta^2 = .059$. In addition, the interaction between intervention condition and outcome type was significant, $F(1.281, 74.313) = 8.775, p = .002, \eta^2 = .074$. Given the significant interaction, post hoc pairwise comparisons were conducted to examine between-group differences for each outcome measure (Supplementary Table 2). The results indicated significant between-group differences across all three outcomes. For post-intervention shame, the mindfulness plus positive reappraisal condition showed significantly lower scores than the positive reappraisal-only condition, $p = .006, d = .756$. For explicit approach-avoidance behavior, the mindfulness plus positive reappraisal condition showed significantly higher scores, $p = .001, d = .908$. Similarly, for implicit approach-avoidance behavior, the mindfulness plus positive reappraisal condition demonstrated significantly higher scores, $p = .001, d = .882$.

Discussion

The main results are as follows. First, analyses of the shame induction task and the interventions revealed significant main effects of measurement time and intervention condition, indicating that shame was successfully induced and subsequently reduced following the interventions. These findings are consistent with prior research showing that positive reappraisal can effectively alleviate negative emotions even in short-term experimental contexts (Troy et al., 2010). Although the interaction effect between measurement time and intervention condition was not significant, the statistically significant reduction from baseline observed in the mindfulness plus positive reappraisal condition may reflect a potentially meaningful pattern. This pattern is consistent with the possibility that mindfulness may have complemented the emotion regulation process (Rough & Strauss, 2024; Troy et al., 2013). However, because the overall interaction effect was not statistically significant, this pattern should be interpreted cautiously and regarded as exploratory rather than conclusive evidence of differential interven-

tion effects.

Second, significant differences between intervention conditions were observed in explicit approach-avoidance behavior. Participants in the mindfulness plus positive reappraisal condition showed greater social approach, whereas those in the positive reappraisal-only condition exhibited stronger avoidance tendencies. This pattern is consistent with prior research linking shame to social withdrawal (Haidt, 2003; Keltner & Harker, 1998) and aligns with the Mindful Coping Model, which posits that mindfulness reduces automatic avoidance and enhances the effectiveness of positive reappraisal through decentering (Garland et al., 2009). However, the notably low level of approach behavior observed in the positive reappraisal-only condition suggests the possibility of a floor effect. If approach responses were concentrated near the lower bound of the scale, resulting in restricted variability, the between-group differences may have been overestimated. Therefore, although the observed group differences are theoretically meaningful, they should be interpreted with caution. Furthermore, the overall low level of approach behavior across conditions suggests that a single-session intervention may be insufficient to induce substantial behavioral change.

Third, in implicit approach-avoidance behavior, the mindfulness plus positive reappraisal condition showed greater approach tendencies, whereas the positive reappraisal-only condition exhibited relatively stronger avoidance. This pattern suggests that the combined intervention influenced social approach tendencies at the implicit level, possibly by attenuating automatically triggered avoidance responses in shame-related contexts (Garland et al., 2009). In addition, the significant interaction between outcome type and intervention condition in the mixed-design ANOVA directly indicates that the intervention effects differed across outcome measures. In particular, the more pronounced between-group differences observed in the behavioral indices suggest that approach-avoidance behavior responded to the intervention in a manner distinct from self-reported shame. However, because this study was not specifically designed to statistically compare effect sizes across outcomes, interpretations regarding the relative sensitivity of different outcome types should be made with caution. In addition, the split-half reliability of the implicit AAT measure in this study was modest ($r = .60$). This level of reliability may have

introduced measurement error and should be taken into account when interpreting the implicit approach-avoidance findings. Accordingly, the implicit results should be considered preliminary and interpreted with appropriate caution.

The significance of this study is as follows. First, the combined intervention of mindfulness and positive reappraisal was associated with greater social approach tendencies and reduced avoidance at the behavioral level compared to positive reappraisal alone. These findings suggest that the integration of the two emotion regulation strategies may produce enhanced behavioral benefits and support their complementary application. In particular, mindfulness may provide an emotional foundation that fosters nonjudgmental acceptance of intense emotions such as shame, thereby facilitating the implementation of positive reappraisal (Garland et al., 2009). Second, by examining individuals with depressive tendencies rather than a general nonclinical sample, this study extends the potential clinical relevance to subclinical populations vulnerable to shame. The findings indicate that mindfulness and positive reappraisal may facilitate social approach behaviors among individuals at elevated risk for depressive symptoms, highlighting their potential utility in preventive intervention contexts.

The limitations of this study and directions for future research are as follows. First, the reliance on self-report measures for participant inclusion and the predominantly undergraduate sample limit the generalizability of the findings to clinically diagnosed populations. Although this study focused on individuals with depressive tendencies to extend clinical relevance to subclinical populations, these participants were not diagnosed through structured clinical interviews, which restricts direct generalization to clinically diagnosed depression. Future studies should incorporate structured clinical interviews and objective diagnostic criteria to enhance diagnostic precision and external validity. Moreover, the use of an extreme-group sampling strategy based on elevated depressive tendencies and the upper 30% of interpersonal vulnerability may further limit the generalizability of the findings. While this approach was intended to identify individuals more vulnerable to shame-related interpersonal difficulties, extreme-group designs may amplify group differences and reduce representativeness of broader populations. Future research should examine

these processes using more diverse samples and continuous sampling strategies. Second, because the design did not include a mindfulness-only or no-intervention control condition, the independent effects of mindfulness could not be isolated, and the use of a single-session intervention may have constrained the detection of cumulative effects. Future research should employ factorial designs and longer-term interventions to more systematically examine the independent and interactive effects of mindfulness and positive reappraisal. In addition, the mindfulness plus positive reappraisal condition involved a longer intervention duration than the positive reappraisal-only condition, which may have introduced potential confounding influences related to time, attentional engagement, or relaxation. Future studies should equate intervention duration across conditions to more clearly disentangle the specific effects of each strategy. Third, differences in task characteristics in the explicit approach-avoidance measure and the exclusive use of neutral stimuli in the implicit task may have limited measurement validity. Future studies should improve task equivalence and include a broader range of emotional stimuli to better capture real-world social contexts (Stins et al., 2011).

Author contributions statement

Y. H. Kim, a graduate student at Kyungpook National University, designed the study, conceptualized the research, collected and analyzed the data, and wrote the manuscript draft. Y. G. Kim and D. E. Hong, a graduate student at Kyungpook National University, analyzed data and assisted in manuscript preparation. M. S. Chang, professor at Kyungpook National University, supervised the research process and reviewed the manuscript. All authors provided critical feedback, participated in the revision of the manuscript, and approved the final submission.

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Supplementary Table 1. Baseline Equivalence Tests and Participant Characteristics by Condition

Group	MPR	PR	Statistic	<i>p</i>	Effect size
	<i>M (SD)</i>	<i>M (SD)</i>			
Gender (male:female)	3:27	8:22	2.783	.095	.215
Age	22.70 (6.482)	22.43 (2.861)	.206	.837	.053
Depression	29.37 (12.433)	26.93 (12.771)	.748	.458	.193
Interpersonal vulnerability	35.50 (5.463)	33.70 (5.107)	1.318	.193	.340
Baseline shame	8.90 (4.205)	10.93 (4.906)	-1.724	.090	-.445

MPR = Mindfulness plus Positive Reappraisal; PR = Positive Reappraisal Only.

Supplementary Table 2. Pairwise Comparisons of Intervention Conditions Across Outcome Measures

Outcome	Group (A)	Group (B)	Mean Difference (A-B)	SE	<i>p</i>	Cohen's <i>d</i>
Shame	MPR	PR	-2.967**	1.030	.006	.756
E-AAB	MPR	PR	18.500**	5.350	.001	.908
I-AAB	MPR	PR	43.633**	12.993	.001	.882

E-AAB = Explicit approach-avoidance behavior; *I-AAB* = Implicit approach-avoidance behavior; *MPR* = Mindfulness plus Positive Reappraisal; *PR* = Positive Reappraisal Only.

***p* < .01.