

The role of mindfulness in coping with recollections of acute stressors: A laboratory study

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Abstract

Background: There is mounting evidence regarding the psychological benefits of mindfulness. Yet, does mindfulness really help people to cope with the recollection of acute stressors? **Method:** To address this question, we examined the effects of trait mindfulness and experimentally induced mindfulness in cognitive and emotional responses to the recollection of an acute stressor among 76 female college students. **Results:** Trait mindfulness was associated with fewer intrusive thoughts 24 hours after the stress induction, but not with affect balance immediately after the induction. Experimentally induced mindfulness showed the opposite pattern: it was associated with better affect balance immediately after the stress induction, but not with intrusive thoughts 24 hours later. **Conclusions:** These results suggest that even individuals predisposed to mindfulness may find it difficult to use mindfulness to cope effectively with memories of highly stressful events. Furthermore, our results suggest that the effects of brief mindfulness interventions may be too short-lived to really help people cope with such memories. Considered together, these findings highlight the importance of designing mindfulness-based interventions involving not only intensive practice but also specific training to help individuals use mindfulness to cope with acute stressors.

Keywords: Mindfulness; stress; coping; emotional intelligence; training.

Resumen

Influencia de Mindfulness en la adaptación del recuerdo de un estresor agudo: un estudio de laboratorio. Antecedentes: existe creciente evidencia sobre los beneficios psicológicos de mindfulness. Sin embargo, ¿realmente ayuda mindfulness a afrontar la memoria de un estresor agudo? **Método:** para abordar esta cuestión, examinamos los efectos de mindfulness rasgo y mindfulness inducido experimentalmente en la respuesta cognitiva y emocional ante un estresor agudo, entre 76 estudiantes universitarias. **Resultados:** mindfulness rasgo se asoció con menos pensamientos intrusivos 24 horas después de la inducción del estresor, pero sin cambios en el afecto inmediatamente después de la inducción. La inducción experimental de mindfulness mostró un patrón opuesto: se asoció con un mejor afecto inmediatamente después de la inducción del estresor, pero sin afectar a los pensamientos intrusivos 24 horas después. **Conclusiones:** estos resultados sugieren que incluso las personas predispuestas a estados de mindfulness pueden tener dificultades para utilizar mindfulness eficazmente cuando se acuerdan de un estresor agudo. Además, sugieren que los efectos de las intervenciones breves en mindfulness pueden ser demasiado efímeras para afrontar estresores agudos. Considerados en conjunto, estos resultados ponen de relieve la importancia de diseñar intervenciones basadas en mindfulness que impliquen no solo la práctica intensiva, sino también una formación específica que ayude a las personas a utilizar mindfulness para hacer frente a estresores agudos.

Palabras clave: mindfulness; estrés; afrontamiento; inteligencia emocional; entrenamiento.

Mindfulness has been described as “Paying attention in a particular way; on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1990; Segal, Williams, & Teasdale, 2002; Shapiro & Schartz, 1999). There is evidence that trait mindfulness is positively related to effective coping with stressors (Hayes & Feldman, 2004). Currently, several types of clinical programs incorporate mindfulness training. These include mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990), mindfulness-based cognitive therapy (MBCT; Segal, Williams,

& Teasdale, 2002) and mindfulness-based relapse prevention (MBRP; Marlatt & Donovan, 2005). Furthermore, the benefits of mindfulness training for clinical practice have been documented in several reviews (e.g., Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Keng, Smoski, & Robins, 2011). In particular, mindfulness training and related therapies have been found to improve health and coping with stress (Roth & Robbins, 2004; Chang et al., 2004; Gutiérrez, 2011).

There is currently increasing interest in brief interventions incorporating mindfulness training. Outside the clinical realm, however, we still do not know whether individuals who practice mindfulness or receive mindfulness training can actually use this technique to cope effectively with acute stressors in life. Concerns about the generalization of mindfulness training prompted Ramos, Recondo, and Enríquez (2012) to propose specific training to help people apply mindfulness to stressful or emotion-arousing

situations. These authors coined the term mindfulness-based emotional intelligence to designate the capacity to cope effectively with a diverse range of emotional situations using mindfulness.

Recent studies have examined the immediate effects of brief mindfulness-based interventions on dysphoric affect in laboratory settings. Mindfulness instructions attenuated negative affect more than rumination or no instructions among college students (Broderick, 2005) as well as among previously and currently depressed individuals (Huffziger & Kuehner, 2009; Singer & Dobson, 2007). Other studies examined the effects of mindfulness instructions on responses to aversive or emotionally arousing stimuli. In this context, Erisman and Roemer (2010) found that a brief mindfulness intervention reduced negative affect and facilitated emotion regulation compared to a control condition. In sum, laboratory studies using brief mindfulness interventions suggest that a short period of practice, guided meditation, or mere instructions to adopt a stance of mindfulness can have an immediate beneficial effect on affective experience, in line with the effects of longer mindfulness training (Keng et al., 2011).

All these findings suggest that mindfulness facilitates effective coping. Yet, there is little or no empirical research showing that mindfulness facilitates coping with personally relevant acute stressors in non-clinical samples. There have been few experimental studies based on non-clinical samples and, to our knowledge, no such studies asked participants to apply mindfulness instructions in order to cope with a stressful event that they had actually experienced, or with the memory of such a stressful event. The present study sought to address this gap in the literature.

In light of the theory and research outlined above, we sought to address the following research questions: (a) Do individuals reporting high trait mindfulness cope more effectively with the recollection of an acute stressor than individuals less predisposed to experience mindfulness in their lives? (b) Does instructing and guiding individuals to use mindfulness help them to cope more effectively with the recollection of an acute stressor? It is important to examine these questions empirically because, as mentioned earlier, a general predisposition to experience mindfulness in everyday life may not guarantee that individuals can use mindfulness effectively in coping with acute stressors. Additionally, brief mindfulness instructions, guidance, or training may not be sufficient to help individuals cope with the recollection of acute stressors over time.

We examined the effects of both trait mindfulness and an experimental manipulation of mindfulness. The experimental design allowed us to compare the effects of mindfulness instructions with a control group in which participants received no specific guidance for thinking about a recalled stressful situation. We also included an experimental condition where participants were instructed to adopt an analytical mindset, in order to compare the effects of mindfulness and analytical/evaluative thinking, on an exploratory basis.

To disentangle the effects of trait mindfulness from other aspects of psychological functioning and socially desirable reporting, we controlled statistically for self-reported mental health in multiple regression analyses. Considering gender differences in self-disclosure, emotional experience, and emotional expression (e.g., Kring & Gordon, 1998), we recruited only women for this study.

As outcome variables, we measured positive and negative affect immediately after the experimental session, as well as the frequency of intrusive thoughts over the next 24 hours. Effective

copying would be revealed by less negative affect and more positive affect immediately after the recollection of an acute stressor, and fewer intrusive thoughts 24 hours later. We measured different outcome variables at two points in time because the emotional impact of laboratory mood inductions typically lasts only a few minutes, and therefore it would not be informative to measure affect after 24 hours. Considering that participants were instructed to recall an acute stressor, it would also not be informative to examine differences in intrusive thoughts immediately after the experimental manipulation.

Method

Participants

Seventy-six female students from the University of Málaga participated in this study for course credit (mean age = 23.1, $SD = 3.7$).

Instruments

Trait mindfulness was measured at baseline with the 39-item Five-Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Spanish adaptation by Mola-Gubbins, 2009; $\alpha = .77$ for the total score). Sample items: "I make judgments about whether my thoughts are good or bad" and "I find myself doing things without paying attention."

Mental health was measured at baseline using the MH-5 questionnaire, an abridged version of the Health Survey (SF-36) by Ware and Sherbourne (1992; Spanish adaption by Alonso, Prieto, & Antó, 1995). This 5-item scale evaluates symptoms of depression and anxiety during the preceding month ($\alpha = .77$). Sample item: "Have you felt so down in the dumps that nothing could cheer you up?"

Subjective discomfort caused by the recalled situation was measured (as a manipulation check) using a single item, with a 1 to 10 response scale: 1 = *no discomfort*, 10 = *great discomfort*.

Positive and negative state affect were measured at the end of the laboratory session with the corresponding subscales of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988; Spanish adaption by Sandín et al., 1999; $\alpha = .70$ and $.79$, respectively). Each subscale consists of 10 adjectives (e.g., "enthusiastic" for positive affect; and "distressed" for negative affect). Participants were asked to report how they felt "right now."

Intrusive thoughts over the 24 hours following the laboratory session were measured with the corresponding 7-item subscale of the Impact of Event Scale (IES; Horowitz, Wilner, & Álvarez, 1979; Spanish adaptation by Báguena et al., 2001; $\alpha = .86$). Items were adapted to refer to the situation that participants considered for the present study (e.g., the item "I thought about it when I didn't mean to" was reworded as "Did you think about the conversation when you didn't mean to?").

Procedure

When participants arrived at the laboratory, a researcher described the requirements of the study and assured participants that their data would be treated confidentially. After providing informed consent, participants completed a baseline questionnaire

including demographic information and measures of trait mindfulness and mental health. Then they were randomly assigned to one of three experimental conditions—mindfulness ($n = 27$), analytical ($n = 22$) and control group ($n = 27$)—and received oral instructions from one of two trained female research assistants.

All participants received the following instructions: “Please consider an emotionally charged situation that mattered to you. It could be a difficult life experience or a difficult emotional situation, involving an interpersonal relationship, a sexual relationship, an accident, or a health problem affecting someone to whom you feel or felt close. It could be an experience that you have not discussed at all, or have not discussed fully with others. It should be a situation in which you were involved and which still affects you, or which you still think about at times. What is crucial is that this situation really mattered to you.”

The recollection of an acute stressor was expected to induce stress. To check whether participants actually recalled stressful or disturbing situations, as expected—and before proceeding with interviews in the mindfulness and analytical conditions—participants were asked how much discomfort the situation they recollected was causing them.

Subsequent instructions varied across conditions. Participants assigned to the *control* condition were asked to think about this situation in silence. Participants assigned to the *mindfulness* or *analytical* conditions were asked to talk about this experience with the research assistant playing the role of interviewer. In all three conditions, participants were asked to think or talk about this experience for 10 minutes.

In the *mindfulness* condition, the research assistant asked participants: “I would like you to tell me what emotions and bodily sensations you are feeling right now (in relation to the situation that you were asked to consider for this purpose). Please describe these feelings and sensations, and tell me where you experience them. Try to focus on observing and describing your feelings, adopting an attitude of interest, without judging or evaluating your feelings.”

In the *analytical* condition, the research assistant asked participants: “I would like you to tell me about this situation. It is important that you evaluate this experience, try to explain why the situation occurred, and analyze the consequences that it may have for the future.”

Following this experimental manipulation, participants reported how they felt while thinking or talking about the stressful situation they had selected, using the PANAS. At the end of this first session, they were asked not to discuss with others any aspect of the study until they returned to the laboratory 24 hours later. The following day, participants returned to the laboratory and reported the extent to which they experienced intrusive thoughts since the previous session.

Data analysis

Firstly, we examined whether there were differences in mental health and trait mindfulness between experimental groups before the experimental induction, using multivariate analysis of variance (MANOVA). Next, we examined the effects of experimental condition and trait mindfulness on outcome variables, using separate multiple regression analyses for each outcome. Here, we controlled statistically for mental health, entering all independent variables simultaneously. Additionally, and considering that some

readers might like to see analyses of variance, we ran separate ANOVAs to examine the overall effects of experimental condition on each outcome variable, and examined planned contrasts comparing mindfulness and control groups.

Results

The manipulation check indicated that participants did recall stressful situations, as instructed: participants reported that the situation recalled caused them much subjective discomfort ($M = 7.19$ on a 1-10 scale, $SD = 2.35$).

MANOVA found no significant differences between experimental groups on the baseline measures of trait mindfulness and mental health ($F(2, 75) = 0.10, p > .05$).

Multiple regression analyses, including as independent variables trait mindfulness, mental health, and experimental condition (coded using two dummy variables, comparing the mindfulness and the analytical conditions to the control group) are reported in Table 1. Trait mindfulness was negatively related to intrusive thoughts 24 hours after the stress induction [$\beta = -0.54, p < .001, R^2 = 0.43; F(1, 72) = 12.90$]. However, it was not significantly related either to positive or negative affect immediately after the stress induction. These findings indicate that trait mindfulness is associated with fewer intrusive thoughts after 24 hours. However, they also suggest that even individuals reporting high trait mindfulness found it difficult to use mindfulness to improve their affect balance shortly after recalling an acute stressor.

The regression results reported in Table 1 further reveal that participants who were assigned to the mindfulness condition reported higher positive affect and lower negative affect than the control group immediately after the stress induction. However, they did not experience fewer intrusive thoughts 24 hours later. These findings suggest that mindfulness instructions yield some beneficial effects but these may be short lived.

In Table 2, we report analyses of variance for each outcome variable, and the corresponding means for each experimental condition. In contrast with the regression analyses reported above, these ANOVAs simply indicate whether there were significant differences across all three experimental conditions, without considering individual differences in baseline measures. The overall effect of experimental condition was statistically significant

Table 1
Multiple regression analyses predicting intrusive thoughts, positive and negative affect

Independent variable	Intrusive thoughts ^a		Positive affect ^b		Negative affect ^c	
	β	t	β	t	β	t
Trait mindfulness	-0.54	-3.99*	0.14	0.75	-0.05	-0.29
Mental health	-0.17	-2.62*	0.15	1.80*	-0.13	-1.59
Analytical condition (versus control)	-0.19	-1.46	0.43	2.43*	-0.27	-1.56
Mindfulness condition (versus control)	0.08	0.61	0.54	3.06*	-0.35	-2.06*

^a Model $F(4, 72) = 12.90, p < .05; R^2 = 0.43$

^b Model $F(4, 74) = 4.23, p < .05; R^2 = 0.19$

^c Model $F(4, 73) = 2.20, p > .05; R^2 = 0.11$

* $p < .10$; * $p < .05$

Table 2

ANOVA and descriptive statistics for each experimental condition

Dependent variables	ANOVA			Descriptives by experimental condition					
	F	MSE	η^2	Control		Mindfulness		Analytical	
				M	(SD)	M	(SD)	M	(SD)
Negative affect	2.39*	0.36	0.06	1.89	(0.56)	1.55	(0.57)	1.61	(0.67)
Positive affect	4.93*	0.40	0.12	2.14	(0.53)	2.74	(0.69)	2.70	(0.64)
Intrusive thoughts	1.62	0.86	0.04	2	(0.93)	2.31	(0.88)	1.85	(0.98)

Note: 74 ≤ N ≤ 76
* p < .10; * p < .05

for positive affect and marginally significant for negative affect, but not for intrusive thoughts. Planned contrasts comparing the mindfulness and control conditions revealed that the mindfulness manipulation resulted in higher positive and lower negative affect, consistent with the regression results reported above. Readers might like to know that, even using the conservative Scheffé correction for multiple comparisons, participants assigned to the mindfulness condition reported higher positive affect than the control group ($F(2,76) = 4.93; p < .05$). It is also worth noting that simply asking participants to think analytically about a stressful situation also yielded increased positive affect in relation to the control group.

In supplementary regression analyses, we found no significant effects for the interaction between trait mindfulness and the experimental condition of mindfulness (compared to the control condition).

Discussion

Prior research suggests that mindfulness can yield psychological and physical benefits. However, can individuals who are naturally inclined to adopt mindfulness in their daily lives actually use mindfulness effectively to cope with memories of an acute stressor? Is it necessary to instruct or remind these individuals to apply mindfulness when faced with such recollections? Is longer or more specific training required for this purpose? In the present study, we sought preliminary answers to these questions by examining the effects of both individual differences in trait mindfulness and of an experimental manipulation of mindfulness, following a stress induction that involved recalling and thinking about an acute stressor.

Our results indicate that being instructed to apply mindfulness when considering an acute stressor caused participants to experience more positive affect and less negative affect than a control group immediately after the stress induction. However, this mindfulness instruction had no effect on the frequency of intrusive thoughts over the next 24 hours. These findings suggest that the benefits of such a brief mindfulness intervention are relatively short lived. Longer and more intensive training may be needed to help people to cope effectively with the recollection of acute stressors.

Participants scoring high on trait mindfulness reported fewer intrusive thoughts the next day, compared to those less inclined to apply mindfulness in their daily lives. However, they did

not experience more positive affective or less negative affect immediately after recalling and thinking about an acute stressor. These findings suggest that individuals may at first find it difficult to apply mindfulness when circumstances evoke intense memories of acute stressors. These memories may trigger strong emotional responses conditioned through prior experience. They may induce ordinary states of consciousness involving worrying and rumination—unless individuals are specifically instructed or trained to apply mindfulness in these circumstances. After a while, however, habitual patterns of thought and attention set in again, helping individuals who usually apply mindfulness in their daily lives to cope more effectively with the recalled stressor, and hence experience fewer intrusive thoughts. This effect on intrusive thoughts is in line with the results of prior studies linking trait mindfulness to reduced experiential avoidance, rumination and worrying (Hayes & Feldman, 2004).

Although these findings provide evidence regarding the benefits of mindfulness, they raise important questions about the effectiveness and design of mindfulness interventions. First, they suggest that brief mindfulness interventions may not be sufficiently powerful to help people cope with stressful situations or with the memories of stressful events—when they most need help. Second, our findings suggest that even individuals who usually apply mindfulness in their daily lives may benefit from specific training to use mindfulness effectively when coping with stressful situations or with the recollection of acute stressors, and particularly to manage the emotional impact of these recollections. These issues call for further research.

The limitations of our study should be acknowledged. First, a modest sample size limited statistical power to detect weak effects. Therefore, null findings should be interpreted with caution. Second, reliance on an all-female sample of Spanish university students precludes generalization to groups of different gender, age, level of education or nationality. Third, differences between the control group and the other two experimental groups could be partly due to the fact that participants in the control group did not talk to a researcher about the stressful event recalled, whereas other participants did. These issues also call for further research.

It is important to understand how people can best use mindfulness to cope with stressful situations. In this regard, it is interesting to note that both mindfulness and analytical thinking conditions yielded some benefits compared to the control group. This suggests that different ways of coping with the recollection of acute stressors may be similarly effective. It is also possible that mindfulness and analytical thinking facilitate coping through partially overlapping mechanisms. For example, both mindfulness and analytical thinking might enhance awareness, acceptance, and integration of stressful events and memories. This possibility is consistent with meta-analytical findings that the effectiveness of different forms of counseling and psychotherapy is driven by the characteristics that these different approaches have in common more than by their specificities (Ahn & Wampold, 2001). It may therefore prove useful to combine mindfulness training and other strategies (such as fostering active acceptance and integration of difficult emotional experiences) to help people cope with acute stressors.

This idea is consistent with research by Pennebaker, who found that inhibiting disclosure or refraining from writing or talking about a stressful event that concerns us can erode physical and mental health (e.g., Pennebaker, Kiecolt-Graser, & Glaser, 1988). Pennebaker (1997) argued that inhibition undermines high-level

thinking, which bears similarities to mindfulness insofar as it involves a broad awareness of one's feelings and self. Furthermore, Pennebaker viewed the expression of emotion as particularly important to well-being (Pennebaker, Hughes, & O'Heeron, 1987). Subsequent research has provided additional evidence of the importance of emotional expression and integration. Gross and colleagues found that suppressing the nonverbal expression of emotion undermines inner emotional experience and cognitive functioning—as well as the quality of interpersonal interaction (e.g., Gross, 1998). A meta-analysis by Smyth (1998) showed that written emotional expression enhances physical health and psychological well-being. Considered conjointly, this research highlights the potential benefits of using mindfulness training to foster the inner acceptance and integration of emotional experience, in order to help people cope with acute stressors. Additionally, this research suggests that the effects of mindfulness and analytical instructions observed in the present study should not be attributed solely to the interpersonal nature of the interaction with the researcher in these conditions. This attenuates concerns about the internal validity of our study. Nonetheless, we should keep in mind that talking to people who are willing to challenge one's views can help one to reappraise and cope with stressful events (Lepore, Berrocal, Ragan, & Ramos, 2004).

Our findings and review of the literature suggest several avenues for further research. First, it would be important to evaluate the effectiveness of mindfulness training programs involving different combinations of duration and specificity (in particular, varying

emphasis on the acceptance of the emotional experience associated with acute stressors). Second, it would be interesting to examine whether experienced meditators also require specific training in order to use mindfulness effectively to cope with acute stressors. Third, investigating which individual differences moderate the effects of mindfulness-based and other interventions designed to help people cope with acute stressors would help us understand who might benefit the most from different types of training.

Despite the limitations of the present study, our findings break new ground in comparing the effects of trait mindfulness and mindfulness instructions on coping with an acute stressor. Furthermore, they raise provoking questions with implications for the design of mindfulness training programs. Although some important questions have yet to be addressed, taking into consideration existing theory and research, we believe that mindfulness training programs should address two concerns if they are to help people cope with the lingering effects of acute stressors. First, they should involve intensive practice. This can help people to automatize patterns of thought and attention that may facilitate mindfulness at times when the recollection of acute stressors tends to hijack attention and induce rumination. Second, these programs should specifically foster the acceptance of difficult emotional experiences and the application of mindfulness to various stressors. This can further help people to activate and use this mental tool in challenging situations. We believe these are crucial features of mindfulness-based emotional intelligence training, initially proposed by Ramos, Enríquez and Recondo (2012).

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