

Is emotion regulation the process underlying the relationship between low mindfulness and psychosocial distress?

Christopher A. Pepping, Analise O'Donovan, Melanie J. Zimmer-Gembeck, and Michelle Hanisch

School of Applied Psychology and Griffith Health Institute, Behavioural Basis of Health, Griffith University, Brisbane, Queensland, Australia

Abstract

Emotion regulation deficits are implicated in many forms of psychosocial distress. The aim of the present research was to investigate whether emotion regulation was the process underlying the well-established association between low dispositional mindfulness and greater psychosocial distress. Two studies are presented that examined whether *non-acceptance* of emotion and limited access to emotion regulation *strategies* were the processes underlying the association between low mindfulness and depression, anxiety, stress, general psychological symptoms, interpersonal distress, and social role difficulties in a student sample (Study 1) and a clinical sample (Study 2). In Study 1, there were indirect effects of mindfulness and symptom distress, depression, anxiety, stress, and social role difficulties through *non-acceptance* of emotions. There were indirect associations between mindfulness and symptom distress, interpersonal distress, social role difficulties, depression, anxiety, and stress through lack of access to emotion regulation *strategies*. In Study 2, there were indirect associations between mindfulness and psychological symptom distress, interpersonal distress, depression, anxiety, and stress through lack of access to emotion regulation *strategies*. In brief, emotion regulation difficulties are, at least in part, the process underlying the association of low dispositional mindfulness and psychosocial distress.

Key words: emotion regulation, interpersonal, mindfulness, psychological adjustment, social

Emotion regulation is a multi-faceted construct that refers to the ways in which individuals respond to, and manage emotional distress (Gratz & Roemer, 2004; Gratz & Tull, 2010; Gross, 1998). A growing body of evidence indicates that emotion regulation is a transdiagnostic process that is implicated across many forms of psychosocial distress (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Kring & Sloan, 2010). In the two studies reported here, we examined whether emotion regulation was the intervening variable or the process that might explain the well-established association between dispositional mindfulness and lower levels of psychosocial distress (Keng, Smoski, & Robins, 2011). Specifically, the present research was concerned with the process by which mindfulness may be related to lower psychosocial distress.

Emotion regulation

Much evidence indicates that efforts to avoid or control negative emotion can have paradoxical effects by increasing

or intensifying these experiences (e.g., Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Salters-Pedneault, Tull, & Roemer, 2004; Wenzlaff & Wegner, 2000). Therefore, Gratz and Tull (2010) proposed that emotion regulation is a multi-faceted construct that refers to the ways in which individuals respond to, and manage emotional distress, as opposed to the ways in which individuals control or reduce negative emotion (Gratz & Roemer, 2004; Gratz & Tull, 2010). Gratz and Tull (2010) suggest that emotion regulation involves the (1) awareness and acceptance of emotion; (2) capacity to pursue goal-directed behaviours when distressed; (3) flexible use of emotion-regulation strategies to respond to difficult emotions, as opposed to avoiding difficult emotions; and (4) willingness to experience difficult emotions. Individuals who experience substantial difficulty in regulating their emotional responses to situations are likely to experience greater, and more intense, psychosocial distress. In the present study, we use the conceptualisation and measurement of emotion regulation outlined by Gratz and colleagues (Gratz & Roemer, 2004; Gratz & Tull, 2010).

Emotion dysregulation has been found to underlie many forms of psychosocial distress (Aldao et al., 2010; Kring & Sloan, 2010). Aldao et al. (2010) conducted a meta-analysis of the relationships between emotion regulation strategies and symptoms of psychological disorders such as anxiety disorders, eating disorders, depression, and substance

Correspondence: Christopher A. Pepping, PhD, School of Applied Psychology, Griffith University, 176 Messines Ridge Road, Mt Gravatt, Qld 4122, Australia. Email: c.pepping@griffith.edu.au

Received 12 August 2013. Accepted for publication 21 December 2013.

© 2014 The Australian Psychological Society

misuse. Results revealed that maladaptive strategies such as rumination and avoidance were strongly associated with symptoms of psychopathology. Much evidence attests to a relationship between emotion dysregulation and psychopathology. For example, emotion regulation difficulties are associated with clinical levels of worry (Salters-Pedneault, Roemer, Tull, Rucker, & Mennin, 2006), self-harm (Gratz & Roemer, 2008), depression and anxiety (Ehring, Tuschen-Caffier, Schnulle, Fischer, & Gross, 2010; Vujanovic, Zvolensky, & Bernstein, 2008), insecure attachment (Shaver & Mikulincer, 2009), and borderline personality disorder (Gratz, Rosenthal, Tull, & Lejuez, 2006). In brief, emotion regulation abilities are implicated across a wide range of psychosocial processes and outcomes.

Mindfulness

In the present research, we expected that there would be an indirect effect of mindfulness and lower psychosocial distress through emotion regulation capacity. Mindfulness is commonly defined as the process of 'paying attention in a particular way: on purpose, in the present moment, non-judgementally' (Kabat-Zinn, 1994, p. 4). There are individual differences in levels of mindfulness and the capacity for mindfulness, and mindfulness may therefore be conceptualised as a dispositional trait-like construct (Brown & Ryan, 2003; Keng et al., 2011). Individuals higher in dispositional mindfulness fare better on a variety of psychosocial outcomes than their less mindful counterparts (Brown & Ryan, 2003; Keng et al., 2011). Dispositional mindfulness is associated with greater life-satisfaction and self-esteem (Pepping, O'Donovan, & Davis, 2013). In contrast, lower dispositional mindfulness is associated with depression and anxiety (Brown & Ryan, 2003), neuroticism (Brown & Ryan, 2003), dissociation (Baer, Fischer, & Huss, 2006), insecure attachment (Pepping, O'Donovan, & Davis, *in press*), negative affect (Brown & Ryan, 2003), and difficulties in emotion regulation (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006).

With regards to mindfulness and social processes, theoretically, mindfulness should facilitate a relationally focused, less judgemental, and less experientially avoidant stance to difficult emotions that can arise in intimate relationships, and thus should promote the development and maintenance of satisfying interpersonal relationships (Wachs & Cordova, 2007). Consistent with this proposition, dispositional mindfulness is associated with increased relationship satisfaction in couples (Barnes, Brown, Krusemark, Campbell, & Rogee, 2007). Further, Barnes et al. (2007) investigated the impact of mindfulness on communication behaviours during a conflict discussion task between partners and found that individuals' own mindfulness predicted lower anger and hostility following the conflict discussion. High dispositional mindfulness is associated with increased engagement and

empathy, and reduced anxiety in social situations (Dekeyser, Raes, Leijssen, Leysen, & Dewulf, 2008). Further, individuals higher in dispositional mindfulness tend to have lower levels of self-reported aggressiveness, hostility, hostile attributions, and verbal aggressiveness (Heppner et al., 2008). Despite this growing body of literature demonstrating associations between mindfulness and social processes, few studies have focused on identifying some of the processes that better account for how mindfulness may promote better functioning. Thus, the aim of the present study was to examine whether emotion regulation is one process that accounts for why mindfulness has been associated with better psychosocial functioning.

Emotion regulation as the process underlying the association between mindfulness and psychosocial outcomes

It has been proposed that mindfulness facilitates cognitive, affective, and behavioural flexibility, and allows for more adaptive responses to challenging or threatening situations, as opposed to responding in a habitual or impulsive manner (Bishop et al., 2004). In the context of emotion regulation, mindfulness may facilitate a more adaptive, non-judgemental, and accepting stance towards emotions (Chambers, Gullone, & Allen, 2009) as opposed to engaging in efforts to suppress or avoid these experiences, or becoming overwhelmed or ruminating over these experiences. Consistent with this proposition, higher dispositional mindfulness is associated with adaptive emotion regulation abilities, greater capacity for *acceptance* of negative emotion, and greater access to emotion regulation *strategies* (Baer, Smith, & Allen, 2004; Brown & Ryan, 2003; Pepping, Davis, & O'Donovan, 2013). Further, dispositional mindfulness is associated with less neural reactivity in response to emotional stimuli (Creswell, Way, Eisenberger, & Lieberman, 2007), and greater activity in the systems of the brain associated with cognitive control of emotion (Modinos, Ormel, & Aleman, 2010).

Researchers have begun to examine the processes underlying the relationship between low mindfulness and psychosocial distress, focusing in particular on the role of emotion regulation. Theoretically, mindfulness should facilitate adaptive emotion regulation, which should in turn reduce psychosocial distress, and increase interpersonal relationship functioning. Jimenez, Niles, and Park (2010) found an indirect effect of low mindfulness and depression through positive affect, self-acceptance, and negative mood regulation expectancy in an undergraduate student sample. Several studies have found that emotion regulation difficulties were implicated in the association between low mindfulness and general psychological distress in student populations (Coffey & Hartman, 2008; Coffey, Hartman, & Fredrickson, 2010). Specifically, Coffey and Hartman (2008) found that the

relationship between mindfulness and psychological distress was transmitted by emotion regulation, non-attachment, and rumination processes. Coffey et al. (2010) found the same pattern of results, but extended prior research by also examining mental flourishing as an outcome measure. Again, emotion regulation processes, rumination, and non-attachment were implicated in these relationships. Although these studies are important in demonstrating indirect effects of low mindfulness and psychological distress through emotion regulation in undergraduate students, it is important to examine these associations in samples experiencing clinical levels of psychological distress. Further, it would be beneficial to investigate additional psychological and social outcomes.

In recognition of the importance of examining these associations in clinical populations, Desrosiers, Vine, Klemanski, and Nolen-Hoeksema (2013) investigated whether cognitive reappraisal was the intervening variable in the association between mindfulness and depression and anxiety in a clinical sample. Results revealed an indirect association between low mindfulness and anxiety through rumination and worry, and between low mindfulness and depression through rumination and reappraisal. Although these results demonstrate that reappraisal is involved in the relationship between mindfulness and distress in a clinical sample, some important questions remain. First, the cognitive strategy of reappraisal is somewhat removed from, and even antithetical to, the concept of mindfulness (Chambers et al., 2009). Indeed, Chambers et al. (2009) argue that reappraisal may even reflect a form of experiential avoidance at its most extreme. Although individuals higher in dispositional mindfulness may be better able to cognitively reappraise, it may be more consistent with mindfulness to examine acceptance of emotion, and accessibility to emotion regulation strategies at a broader level in order to more accurately assess the ways in which mindfulness might enhance emotion regulation, rather than focusing only on cognitive strategies. Specifically, factors such as non-acceptance of difficult emotion, and access to strategies to adaptively respond to negative emotion, may be more theoretically consistent with the construct of mindfulness, and may be a more useful focus when examining the processes underlying the beneficial effects of mindfulness. Second, the study focused on depression and anxiety; however, it would also be important to examine whether emotion regulation is the intervening variable in the association between mindfulness and other psychological factors, as well as interpersonal and social functioning. The quality of social and interpersonal relationship functioning has wide-reaching implications, including impact on mental and physical health, as well as mortality risk (Holt-Lunstad, Smith, & Layton, 2010; Umberson & Montez, 2010). Thus, it is important that research begins to understand the pro-

cesses underlying the association between mindfulness and social and relationship functioning.

Remarkably little attention has been paid to the intervening variables implicated in the relationship between mindfulness and social processes. Barnes et al. (2007) found that mindfulness was associated with greater relationship satisfaction, and that dispositional mindfulness was associated with lower emotional stress responses during a conflict discussion between partners. Jones, Welton, Oliver, and Thoburn (2011) found that the association between high mindfulness and relationship satisfaction was mediated by adult attachment security, which is strongly related to healthy emotion regulation (Shaver & Mikulincer, 2009). In brief, these findings are consistent with the proposition that emotion regulation may, at least in part, be responsible for the influence of mindfulness on social processes. However, this has yet to be directly tested.

The current studies

To address gaps and limitations in the literature examining the processes underlying the negative relationship between dispositional mindfulness and psychosocial distress, we examined whether there was an indirect association between mindfulness and psychosocial distress through two aspects of emotion regulation relevant to mindfulness (*non-acceptance* of emotion and limited access to emotion regulation strategies) across a range of psychological (depression, anxiety, stress, general psychological symptoms) and social (interpersonal distress and social role difficulties) outcomes in an undergraduate student sample (Study 1) and in a clinical sample (Study 2). In both studies, it was hypothesised that there would be an indirect association between low mindfulness and greater psychosocial distress through *non-acceptance* of emotion, and lack of access to emotion regulation strategies.

STUDY 1

Participants

Participants were 639 undergraduate students enrolled in an introductory psychology course (483 females and 156 males, ranging in age from 15 to 55 years, $M = 21.06$ years, standard deviation (SD) = 6.24).

Measures

Mindfulness

The Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) is a 39-item measure of mindfulness. The scale consists of five subscales, which can also be summed to yield

a total score. Example items include 'It is easy for me to concentrate on what I'm doing' and 'When I'm walking, I deliberately notice the sensations of my body moving'. In the interests of parsimony, we used the total score of the FFMQ for all analyses. Cronbach's α in the present sample was .88 for the total score.

Emotion dysregulation

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item measure that assesses emotion regulation difficulties, and consists of six subscales (non-acceptance, goals, impulse, awareness, strategies, and clarity). The scale has good construct validity and high internal consistency, $\alpha = .93$ (Gratz & Roemer, 2004). The present research was concerned with two aspects of emotion regulation: *non-acceptance* of emotion and limited access to emotion regulation *strategies*. *Non-acceptance* of emotion refers to the extent to which individuals are willing and able to be accepting of emotion, and to respond non-judgementally to difficult emotions (e.g., 'When I'm upset, I become angry with myself for feeling that way' and 'When I'm upset, I feel like I am weak.'). Lack of access to *strategies* refers to the extent to which an individual has access to ways of effectively managing and responding to difficult emotions (e.g., 'When I'm upset, I believe that I will remain that way for a long time' and 'When I'm upset, I believe that wallowing in it is all I can do'; Gratz & Roemer, 2004). Cronbach's α was .92 for both the *non-acceptance* of emotion subscale and for the *strategies* subscale in the present sample.

Emotional adjustment

The Depression, Anxiety, and Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995) is a 21-item scale consisting of three subscales: depression (e.g., 'I felt that life was meaningless'), anxiety (e.g., 'I felt I was close to panic'), and stress (e.g., 'I found myself getting agitated'). The measure is widely used and psychometrically valid

(Lovibond & Lovibond, 1995). Cronbach's α in the present sample was .90, .86, and .87 for depression, anxiety, and stress respectively.

Psychological and interpersonal functioning

The Outcome Questionnaire-45.2 (OQ-45.2; Lambert et al., 2004) is a 45-item measure that assesses global assessment of psychosocial functioning (i.e., the total score), as well as three subscale scores: symptom distress (e.g., 'I have thoughts of ending my life'), interpersonal relationships (e.g., 'I get along well with others' (reverse scored)), and social role performance (e.g., 'I feel stressed at work/school'). Higher scores reflect greater distress. A total score of 63 or above indicates clinically significant distress. The scale has good reliability and validity in both clinical and non-clinical populations (Whipple et al., 2003). Cronbach's α in the present sample was .94, .93, .75, and .70 for the total score, subjective distress, interpersonal relationships, and social role respectively.

Procedure

Participants were first-year university students, participating for experimental credit. They completed a battery of questionnaires that included the measures mentioned above, as well as several other measures unrelated to the present study.

RESULTS

Descriptive statistics and correlations

Descriptive statistics and correlations between all variables of interest are displayed in Table 1. Depression and anxiety scores were in the mild clinical range. The mean total score of the OQ-45.2 was 80.31, indicating that the sample appeared to be experiencing clinical levels of psychosocial distress on average.

Table 1 Descriptive statistics and correlations between all measures

	Study 1		Study 2		1	2	3	4	5	6	7	8	9
	Mean	SD	Mean	SD									
1. Mindfulness	121.74	18.56	106.67	21.24	–	–.55**	–.58**	–.54**	–.36**	–.48**	–.40**	–.39**	–.48**
2. Non-acceptance	14.61	6.09	17.84	5.48	–.52**	–	.52**	.38**	.14	.21	.34*	.31*	.34*
3. Lack of strategies	19.32	7.69	23.49	6.85	–.58**	.67**	–	.55**	.48**	.37**	.69**	.54**	.66**
4. Symptom distress	46.02	18.65	48.93	15.26	–.49**	.55**	.65**	–	.65**	.72**	.67**	.67**	.78**
5. Interpersonal distress	18.25	7.77	18.60	6.67	–.31**	.33**	.40**	.72**	–	.66**	.52**	.40**	.53**
6. Social role difficulties	16.04	5.80	13.78	4.71	–.29**	.30**	.33**	.73**	.63**	–	.44**	.49**	.56**
7. Depression	10.49	9.71	16.29	11.24	–.46**	.54**	.69**	.67**	.43**	.37**	–	.51**	.64**
8. Anxiety	8.77	8.48	11.20	8.11	–.42**	.47**	.51**	.55**	.34**	.31**	.66**	–	.75**
9. Stress	13.10	8.95	20.62	9.61	–.45**	.52**	.60**	.55**	.32**	.33**	.70**	.71**	–

Note. Study 1 correlations are below the diagonal ($N = 639$). Study 2 correlations are above the diagonal ($N = 55$).

* $p < .05$, ** $p < .01$.

Indirect effects

The associations of mindfulness (IV) with psychosocial distress (DVs), as well as the role of the mediator, namely emotion dysregulation (*non-acceptance* and lack of *strategies*, M), were tested with bootstrapping using 5,000 bootstrap samples in a multiple mediation model to test for indirect effects (Preacher & Hayes, 2004). Mindfulness was associated with emotion dysregulation in the expected direction. Specifically, mindfulness was associated with lower *non-acceptance* ($-.17, p < .001$) and with less difficulty accessing *strategies* ($-.24, p < .001$). Moreover, as shown in Table 2, participants who reported more mindfulness were less adjusted across all outcomes measures (Path C), and both *non-acceptance* and *strategies* were associated with each measure of psychosocial distress (Path B), with the exception of the non-significant association between *non-acceptance* and interpersonal distress. Table 2 also displays the indirect effects of mindfulness on psychosocial outcomes through emotion dysregulation.

There were significant indirect effects of mindfulness on symptom distress, social role difficulties, depression, anxiety, and stress via *non-acceptance*, but also direct negative associations (Path C'). *Non-acceptance* did not have a significant indirect effect on interpersonal distress. There was a significant indirect effect of mindfulness on all outcomes through lack of access to *strategies*, but the negative direct relationship between mindfulness and the outcome variables remained significant (Path C'), indicating both direct and indirect effects.

DISCUSSION

The aim of Study 1 was to examine whether emotion regulation difficulties are the process underlying the association

between low mindfulness and psychosocial distress. As predicted, there were indirect relationships between mindfulness and symptom distress, depression, anxiety, stress, and social role difficulties through *non-acceptance* of emotions, but the direct effects also remained. There were significant indirect associations between mindfulness and symptom distress, interpersonal distress, social role difficulties, depression, anxiety, and stress through lack of access to *strategies*, although again, the direct effects of mindfulness on the outcomes remained. Although the present sample was experiencing clinical levels of psychological distress, it would be important to examine these relationships in clinically distressed individuals who are seeking treatment. Further, in light of growing concern over false-positive findings, it is important that results can be replicated (Simmons, Nelson, & Simonsohn, 2011). Therefore, we aimed to replicate and extend these findings by examining this association in a clinical sample. For this purpose, we investigated the same hypotheses in a sample of women seeking treatment for eating pathology.

STUDY 2

Method

Participants

Participants were 55 females seeking psychological intervention for eating disorder symptoms, ranging in age from 19 to 67 years ($M = 39$ years, $SD = 12.66$). Of these participants, 20.6% of participants met Diagnostic and Statistical Manual of Mental Disorders-IV Text Revision criteria for bulimia nervosa, 32.5% met criteria for binge eating disorder, and 46.8% of participants met criteria for eating disorder—not otherwise specified.

Table 2 Study 1 and Study 2 unstandardised associations (B) in the analyses of indirect effects

Outcome	Path B (non-accept), B	Path B (strategies), B	Path C, B	Path C', B	Indirect effect via non-accept, B ($CI_{95\%}$)	Indirect effect via strategies, B ($CI_{95\%}$)
Study 1 ($N = 639$)						
Symptom distress	.50**	1.13**	-.49**	-.13**	-.09 (–.130 to –.045)	-.27 (–.330 to –.214)
Interpersonal distress	.12	.28**	-.13**	-.04*	–	-.07 (–.093 to –.042)
Social role difficulties	.11*	.14**	-.09**	-.04**	-.02 (–.037 to –.001)	-.03 (–.055 to –.012)
Depression	.18**	.72**	-.24**	-.04*	-.03 (–.057 to –.007)	-.17 (–.208 to –.143)
Anxiety	.28**	.32**	-.19**	-.07**	-.05 (–.073 to –.026)	-.08 (–.106 to –.051)
Stress	.27**	.47**	-.22**	-.06**	-.05 (–.070 to –.024)	-.11 (–.144 to –.085)
Study 2 ($N = 55$)						
Symptom distress	.07	.78**	-.39**	-.23*	–	-.15 (–.281 to –.033)
Interpersonal distress	-.26	.47**	-.11**	-.06	–	-.09 (–.150 to –.035)
Social role difficulties	-.11	.13	-.11**	-.10**	–	–
Depression	-.03	.57**	-.11**	.00	–	-.11 (–.166 to –.058)
Anxiety	.00	.28**	-.07**	-.02	–	-.05 (–.105 to –.015)
Stress	-.05	.41**	-.11**	-.04	–	-.08 (–.127 to –.038)

Note. Path B = associations between the emotion regulation mediators and psychosocial adjustment; Path C = the total effect of mindfulness on psychosocial adjustment; Path C' = direct effect of mindfulness on psychosocial adjustment when considering the emotion regulation mediators; Indirect = indirect effect of mindfulness on psychosocial adjustment via emotion regulation.

* $p < .05$, ** $p < .01$.

Measures

Measures used in the present study were the same as in Study 1. Cronbach's α in the present sample was .91 for the total mindfulness score as measured by the FFMQ. Cronbach's α was .87 and .88 for the *non-acceptance* and *strategies* subscales of the DERS respectively. Internal reliability was .92, .76, and .87 for the depression, anxiety, and stress subscales of the DASS-21 respectively. Finally, Cronbach's α was .92, .79, and .74 for the subjective distress, interpersonal relationships, and social role subscales of the OQ-45.2 respectively.

Procedure

Participants were recruited from the community, and were seeking treatment for disordered eating. Following completion of the pre-intervention questionnaire, participants were randomly assigned to either a mindfulness-based intervention for eating pathology or to a wait-list control condition. Only pre-intervention data were used in the current study.

RESULTS

Descriptive statistics and a correlation matrix are displayed in Table 1. Depression, anxiety, and stress scores were all in the moderate clinical range, indicating clinical levels of distress. The mean total score of the OQ-45.2 was 81.31, placing the present sample in the range for psychosocial distress.

Indirect effects

The same methodology was used to examine indirect effects as in Study 1. Mindfulness was associated with less emotion dysregulation, including lower *non-acceptance* ($-.14, p < .001$) and less difficulty accessing *strategies* ($-.19, p < .001$).

Table 2 displays coefficients from the analyses, including the indirect effects. Mindfulness was associated with less psychosocial distress across all of the outcome variables (Path C). *Non-acceptance* was not associated with any measure of psychosocial distress, but lack of *strategies* was associated with all measures of psychosocial distress with the exception of social role difficulties (Path B). As was found in Study 1, lack of access to *strategies* partially accounted for the association between mindfulness and one measure of psychosocial distress (symptom distress), as there was a significant indirect effect through *strategies*, but the direct effect of mindfulness on symptom distress remained significant (Path C'). Lack of *strategies* fully explained the association between mindfulness and interpersonal distress, depression, anxiety, and stress, as there was a negative indirect effect through

strategies, and no significant direct effect of mindfulness on the outcomes when controlling for the mediators (Path C').

Discussion

Results indicate that in a clinically distressed sample of women, there was an indirect effect of low mindfulness on greater symptom distress through lack of access to emotion regulation *strategies*, but the direct effect of mindfulness on symptom distress remained significant. There was an indirect effect between mindfulness and interpersonal distress, depression, anxiety, and stress through lack of access to *strategies*, and no direct effect between mindfulness and these outcomes. These results suggest that in a clinically distressed sample, individuals low in mindfulness experience greater psychosocial distress, which can almost fully be explained by their lack of access to emotion regulation strategies.

GENERAL DISCUSSION

Findings of the two studies presented here shed light on the underlying processes that can account for why mindfulness is associated with less psychosocial distress. Results demonstrate that emotion regulation difficulties are, at least in part, implicated in this process. Results are consistent with other literature that has identified emotion regulation difficulties as a correlate of greater psychosocial distress (Aldao et al., 2010; Kring & Sloan, 2010) and mindfulness as protective against psychosocial distress (Keng et al., 2011).

In Study 1, there was an indirect effect between mindfulness and psychological symptom distress, social role difficulties, depression, anxiety, and stress through *non-acceptance* of emotions, but the direct effect of mindfulness on these outcomes remained. This suggests that the reason why low mindfulness is associated with these specific symptoms of psychological distress is partially due to difficulties in accepting distressing emotion, and the tendency to be self-critical for experiencing difficult emotions. The finding of the negative indirect association of mindfulness and psychological symptom distress, interpersonal distress, social role difficulties, depression, anxiety, and stress through lack of access to emotion regulation *strategies* suggests that individuals low in mindfulness report being less able to respond to distressing emotion adaptively, which has a negative impact on psychosocial functioning. Indirect effects of the association between mindfulness and psychological distress were found through *non-acceptance* and *strategies*, whereas the indirect effect of the association between mindfulness and interpersonal distress was found only through *strategies*. Perhaps *non-acceptance*, arguably an internal process, impacts more readily on intrapsychic processes such as depression and anxiety, whereas a lack of access to *strategies*, and ways in which one

can respond adaptively to negative emotion, has greater implications for interpersonal relationships. These results are consistent with studies examining emotion regulation as an intervening variable in student populations (Coffey & Hartman, 2008), and extend these findings by examining emotion regulation constructs that are consistent with mindfulness, and by also examining social outcomes.

Findings from the clinical sample (Study 2) that lack of access to emotion regulation *strategies* partially accounted for the negative association between mindfulness and psychological symptom distress, and fully accounted for the association between mindfulness and interpersonal distress, depression, anxiety, and stress, are consistent with results from Study 1. These results suggest that in a clinically distressed sample, individuals low in mindfulness experience greater psychosocial distress, which can almost fully be explained by their lack of access to emotion regulation strategies. Interestingly, there were no indirect effects through *non-acceptance* in the clinical sample. Perhaps in clinical samples experiencing considerably higher levels of psychosocial distress, over time, the continued lack of *strategies* to respond to difficult emotions leads to greater distress, rather than the more internal process of *non-acceptance* of emotion. Longitudinal research examining the indirect effects of mindfulness on psychosocial distress through *non-acceptance* and *strategies* is greatly needed to more definitely test this proposition.

The interesting finding that, in general, emotion regulation difficulties partially accounted for this association in a non-clinical sample, and fully accounted for the association in a clinical sample warrants discussion. This pattern of results reveals that in women with eating disorders (likely a more homogenous group than undergraduate students), low mindfulness is related to a lack of emotion regulation *strategies*, which, in turn, leads to symptom distress, depression, anxiety, and stress, as well as interpersonal distress. There was no direct effect of mindfulness on these variables when controlling for emotion dysregulation in the clinical sample, but rather only an indirect effect through reduced *strategies*. Given that emotion regulation deficits are implicated in disordered eating (Aldao et al., 2010), it is perhaps not surprising that these deficits fully account for the mindfulness–psychosocial distress relationship in this clinical sample.

The finding that the student sample (Study 1) scored in the clinical range on the OQ-45.2, and in the mild clinical range for depression and anxiety as assessed by the DASS-21, warrants discussion. Although the clinical sample (Study 2) displayed higher levels of distress than did the student sample, it is important to note that both samples were experiencing clinical levels of psychosocial distress. The finding that undergraduate psychology students were experiencing elevated psychosocial distress is consistent with prior research in undergraduate psychology students (e.g., Leahy

et al., 2010), and undergraduate students more broadly (e.g., Bayram & Bilgel, 2008). It is possible that the competing demands of university study, part-time employment, and family commitments may explain the high rates of psychosocial distress in university students. It is also possible that individuals with pre-existing psychosocial distress may be particularly motivated to study psychology. Nonetheless, although the levels of psychosocial distress were lower in the undergraduate student sample than the clinical sample, future research should aim to replicate the present results in a sample *not* experiencing clinical levels of psychosocial distress.

Although the focus of the present research was dispositional mindfulness, it is important to note that research pertaining to the mechanisms of action in mindfulness-based clinical interventions provides some converging evidence of the results of the present research of the mediating role of emotion regulation with regards to psychological outcomes (e.g., Van Dam, Hobkirk, Sheppard, Aviles-Andrews, & Earlywine, in press). However, again, the interpersonal and social aspects were not examined in this study.

There are some limitations to acknowledge. First, the cross-sectional nature of the present research precludes definitive conclusions regarding causation. Specifically, although the model tested in the present research proposes that mindfulness enhances emotion regulation, which in turn reduces psychosocial distress, it is not possible to establish causation without manipulations of mindfulness. For example, experimental mindfulness inductions and randomised controlled trials aimed at enhancing mindfulness would be necessary further steps to demonstrate that these variables are causally related. Although the focus of the present research was dispositional mindfulness, as opposed to experimentally or clinically enhanced mindfulness, both experimental mindfulness inductions (e.g., Arch & Craske, 2006) and mindfulness interventions (e.g., Robins, Keng, Ekblad, & Brantley, 2012) have been shown to enhance emotion regulation, and mindfulness interventions consistently reduce psychosocial distress (Keng et al., 2011). In brief, although the present research was concerned with dispositional mindfulness, the cross-sectional nature of the studies presented here means causation cannot be established. However, results from experimental and clinical intervention studies are consistent with the model presented here. Further research should examine the role of dispositional mindfulness and emotion regulation on psychosocial distress longitudinally.

Second, there is an established association between both low mindfulness and eating pathology (e.g., Baer et al., 2006) and between emotion dysregulation and eating pathology (Aldao et al., 2010). Thus, the present clinical sample of women with eating pathology was an appropriate sample with which to examine the present research

question. It is unknown how generalisable the findings are to other clinical populations, or to males. However, there is high comorbidity among individuals with eating disorders with other disorders, such as mood and anxiety disorders, and personality disorders (Braun, Sunday, & Halmi, 1994). Nonetheless, future research should examine the relationship between mindfulness, emotion regulation, and psychosocial distress with specific populations related to each of the outcomes in the present research (e.g., a group of depressed patients, various anxiety disorders, chronic stress, and relationship distress). It is also important to acknowledge that the number of statistical tests performed within each sample may inflate the chance of Type I error. Finally, although the aim of the present research was to extend prior research pertaining to the role of emotion dysregulation in the mindfulness–psychosocial distress association, it is acknowledged that other variables are likely to be involved in this association. Further, the present research does not clarify the relative importance of emotion dysregulation compared with other possible processes underlying this association.

The present research extends prior research by examining components of emotion regulation that are theoretically consistent with mindfulness in both clinical and non-clinical populations. Further, this research was the first to examine the indirect effect of mindfulness and social outcomes through emotion regulation strategies. The present research reveals that emotion dysregulation is, at least in part, the process underlying the association between low dispositional mindfulness and greater psychosocial distress in both clinical and non-clinical populations.

REFERENCES

- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion regulation strategies across psychopathology: A meta-analysis. *Clinical Psychology Review, 30*(2), 217–237. doi:10.1016/j.cpr.2009.11.004
- Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy, 44*(12), 1849–1858. doi:10.1016/j.brat.2005.12.007
- Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: The Kentucky inventory of mindfulness skills. *Assessment, 11*(3), 191–206. doi:10.1177/1073191104268029
- Baer, R. A., Fischer, S., & Huss, D. B. (2006). Mindfulness and acceptance in the treatment of disordered eating. *Journal of Rational Emotive and Cognitive-Behavior Therapy, 23*(4), 281–300. doi:10.1007/s10942-005-0015-9
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27–45. doi:10.1177/1073191105283504
- Barnes, S., Brown, K. W., Krusemark, E., Campbell, W. K., & Rogee, R. D. (2007). The role of mindfulness in romantic relationship satisfaction and responses to relationship stress. *Journal of Marital and Family Therapy, 33*(4), 482–500. doi:10.1111/j.1752-0606.2007.00033.x
- Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social Psychiatry and Psychiatric Epidemiology, 43*, 667–672. doi:10.1007/s00127-008-0345-x
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3), 230–241. doi:10.1093/clipsy.bph077
- Braun, D. L., Sunday, S. R., & Halmi, K. A. (1994). Psychiatric comorbidity in patients with eating disorders. *Psychological Medicine, 24*(4), 859–867. doi:10.1017/S0033291700028956
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822–848. doi:10.1037/0022-3514.84.4.822
- Chambers, R., Gullone, E., & Allen, N. B. (2009). Mindful emotion regulation: An integrative review. *Clinical Psychology Review, 29*(6), 560–572. doi:10.1016/j.cpr.2009.06.005
- Coffey, K., & Hartman, M. (2008). Mechanisms of action in the inverse relationship between mindfulness and psychological distress. *Complementary Health Practice Review, 13*(2), 79–91. doi:10.1177/1533210108316307
- Coffey, K. A., Hartman, M., & Fredrickson, B. L. (2010). Deconstructing mindfulness and constructing mental health: Understanding mindfulness and its mechanisms of action. *Mindfulness, 1*(4), 235–253. doi:10.1007/s12671-010-0033-2
- Creswell, J., Way, B. M., Eisenberger, N. I., & Lieberman, M. D. (2007). Neural correlates of dispositional mindfulness during affect labeling. *Psychosomatic Medicine, 69*(6), 560–565. doi:10.1097/PSY.0b013e3180f6171f
- Dekeyser, M., Raes, F., Leijssen, M., Leysen, S., & Dewulf, D. (2008). Mindfulness skills and interpersonal behaviour. *Personality and Individual Differences, 44*(5), 1235–1245. doi:10.1016/j.paid.2007.11.018
- Desrosiers, A., Vine, V., Klemanski, D. H., & Nolen-Hoeksema, S. (2013). Mindfulness and emotion regulation in depression and anxiety: Common and distinct mechanisms of action. *Depression and Anxiety, 30*(7), 654–661. doi:10.1002/da.22124
- Ehring, T., Tuschen-Caffier, B., Schnulle, J., Fischer, S., & Gross, J. J. (2010). Emotion regulation and vulnerability to depression: Spontaneous versus instructed use of emotion suppression and reappraisal. *Emotion (Washington, D.C.), 10*(4), 563–572. doi:10.1037/a0019010
- Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment, 26*(1), 41–54. doi:10.1023/B:JOBA.0000007455.08539.94
- Gratz, K. L., & Roemer, L. (2008). The relationship between emotion dysregulation and deliberate self-harm among female undergraduate students at an urban commuter university. *Cognitive Behaviour Therapy, 37*(1), 14–25. doi:10.1080/16506070701819524
- Gratz, K. L., & Tull, M. T. (2010). Emotion regulation as a mechanism of change in acceptance- and mindfulness-based treatments. In R. Baer (Ed.), *Assessing mindfulness and acceptance processes in clients: Illuminating the theory and process of change* (pp. 107–133). Oakland, CA: New Harbinger Publications.
- Gratz, K. L., Rosenthal, M. A., Tull, M. T., & Lejuez, C. W. (2006). An experimental investigation of emotion dysregulation in borderline personality disorder. *Journal of Abnormal Psychology, 115*(4), 850–855. doi:10.1037/0021-843X.115.4.850
- Gross, J. (1998). The emerging field of emotion regulation. *Review of General Psychology, 2*(3), 271–299. doi:10.1037/1089-2680.2.3.271

- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, process and outcomes. *Behaviour Research and Therapy*, 44(1), 1–25. doi:10.1016/j.brat.2005.06.006
- Heppner, W. L., Kernis, M. H., Lakey, C. E., Campbell, W., Goldman, B. M., Davis, P. J., & Cascio, E. V. (2008). Mindfulness as a means of reducing aggressive behavior: Dispositional and situational evidence. *Aggressive Behavior*, 34(5), 486–496. doi:10.1002/ab.20258
- Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Medicine*, 7(7), doi:10.1371/journal.pmed.1000316.g001
- Jimenez, S. S., Niles, B. L., & Park, C. L. (2010). A mindfulness model of affect regulation and depressive symptoms: Positive emotions, mood regulation expectancies, and self-acceptance as regulatory mechanisms. *Personality and Individual Differences*, 49(6), 645–650. doi:10.1016/j.paid.2010.05.041
- Jones, K. C., Welton, S. R., Oliver, T. C., & Thoburn, J. W. (2011). Mindfulness, spousal attachment, and marital satisfaction: A mediated model. *The Family Journal*, 19(4), 357–361. doi:10.1177/1066480711417234
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York: Hyperion.
- Keng, S.-L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*, 31(6), 1041–1056. doi:10.1016/j.cpr.2011.04.006
- Kring, A. M., & Sloan, D. S. (2010). *Emotion regulation and psychopathology*. New York: Guilford Press.
- Lambert, M. J., Morton, J. J., Hatfield, D., Harmon, C., Hamilton, S., et al. (2004). *Administration and scoring manual for the OQ-45.2 (Outcome Questionnaire)*. Stevenson, MD: American Professional Credentialing Services.
- Leahy, C. M., Peterson, R. F., Wilson, I. G., Newbury, J. W., Tonkin, A. L., & Turnbull, D. (2010). Distress levels and self-reported treatment rates for medicine, law, psychology, and mechanical engineering tertiary students: Cross-sectional study. *The Australian and New Zealand Journal of Psychiatry*, 44(7), 608–615. doi:10.3109/00048671003649052
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the beck depression and anxiety inventories. *Behavior Research and Therapy*, 33(3), 335–343. doi:10.1016/0005-7967(94)00075-U
- Modinos, G., Ormel, J., & Aleman, A. (2010). Individual differences in dispositional mindfulness and brain activity involved in reappraisal of emotion. *Social Cognitive and Affective Neuroscience*, 5(4), 369–377. doi:10.1093/scan/nsq006
- Pepping, C. A., Davis, P. J., & O'Donovan, A. (2013). Individual differences in attachment and dispositional mindfulness: The mediating role of emotion regulation. *Personality and Individual Differences*, 54(3), 453–456. doi:10.1016/j.paid.2012.10.006
- Pepping, C. A., O'Donovan, A., & Davis, P. J. (2013). The positive effects of mindfulness on self-esteem. *The Journal of Positive Psychology*, 8(5), 376–386. doi:10.1080/17439760.2013.807353
- Pepping, C. A., O'Donovan, A., & Davis, P. J. (in press). The differential relationship between mindfulness and attachment in experienced and inexperienced meditators. *Mindfulness*, doi:10.1007/s12671-012-0193-3
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36(4), 717–731. doi:10.3758/BF03206553
- Robins, C. J., Keng, S.-L., Ekblad, A. G., & Brantley, J. G. (2012). Effects of mindfulness-based stress reduction on emotional experience and expression: A randomized controlled trial. *Journal of Clinical Psychology*, 68(1), 117–131. doi:10.1002/jclp.20857
- Salters-Pedneault, K., Tull, M. T., & Roemer, L. (2004). The role of avoidance of emotional material in the anxiety disorders. *Applied and Preventative Psychology*, 11(2), 95–114. doi:10.1016/j.appsy.2004.09.001
- Salters-Pedneault, K., Roemer, L., Tull, M. T., Rucker, L., & Mennin, D. S. (2006). Evidence of broad deficits in emotion regulation associated with chronic worry and generalized anxiety disorder. *Cognitive Therapy and Research*, 30(4), 469–480. doi:10.1007/s10608-006-9055-4
- Shaver, P. R., & Mikulincer, M. (2009). Adult attachment strategies and the regulation of emotion. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 446–465). New York: Guilford Press.
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, 22(11), 1359–1366. doi:10.1177/0956797611417632
- Umberson, D., & Montez, J. K. (2010). Social relationships and health: A flashpoint for health policy. *Journal of Health and Social Behavior*, 51, s54–s66. doi:10.1177/0022146510383501
- Van Dam, N. T., Hobkirk, A. L., Sheppard, S. C., Aviles-Andrews, R., & Earlywine, M. (in press). How does mindfulness reduce anxiety, depression, and stress? An exploratory examination of change processes in wait-list controlled mindfulness meditation training. *Mindfulness*, doi:10.1007/s12671-013-0229-3
- Vujanovic, A. A., Zvolensky, M. J., & Bernstein, A. (2008). The interactive effects of anxiety sensitivity and emotion dysregulation in predicting anxiety-related cognitive and affective symptoms. *Cognitive Therapy and Research*, 32(6), 803–817. doi:10.1007/s10608-007-9148-8
- Wachs, K., & Cordova, J. V. (2007). Mindful relating: Exploring mindfulness and emotion repertoires in intimate relationships. *Journal of Marital and Family Therapy*, 33(4), 464–481. doi:10.1111/j.1752-0606.2007.00032.x
- Wenzlaff, R. M., & Wegner, D. M. (2000). Thought suppression. *Annual Review of Psychology*, 51(1), 59–91. doi:10.1146/annurev.psych.51.1.59
- Whipple, J. L., Lambert, M. J., Vermeersch, D. A., Smart, D. W., Nielsen, S. L., & Hawkins, E. J. (2003). Improving the effects of psychotherapy: The use of early identification of treatment failure and problem solving strategies in routine practice. *Journal of Counseling Psychology*, 50(1), 59–68. doi:10.1037/0022-0167.50.1.59

Copyright of Australian Journal of Psychology is the property of Wiley-Blackwell and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.