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The Role of Mindfulness and Psychological Flexibility in Somatization, Depression, Anxiety, and General Psychological Distress in a Nonclinical College Sample

Akihiko Masuda, PhD[1] and Erin C. Tully, PhD[1]

Abstract

The current study investigated whether mindfulness and psychological flexibility uniquely and separately accounted for variability in psychological distress (somatization, depression, anxiety, and general psychological distress). An ethnically diverse, nonclinical sample of college undergraduates (N = 494, 76% female) completed a Web-based survey that included the self-report measures of interest. Consistent with prior research, psychological flexibility and mindfulness were positively associated with each other, and tested separately, both variables were negatively associated with somatization, depression, anxiety, and general psychological distress. Results also revealed that psychological flexibility and mindfulness accounted for unique variance in all 4 measures of distress. These findings suggest that mindfulness and psychological flexibility are interrelated but not redundant constructs and that both constructs are important for understanding the onset and maintenance of somatization, depression, anxiety, and general distress.

Keywords

psychological distress, somatization, depression, anxiety, mindfulness, psychological flexibility, experiential avoidance

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Introduction

Recently, cognitive–behavioral therapies have been expanding to include mindfulness and psychological flexibility into their conceptual frameworks,[1] as growing evidence has shown their salutary role.[2,3] In theory, the 2 processes are often conceptualized as adaptive regulation and coping processes that reflect greater psychological health.[3,4] Literature also supports the effectiveness of acceptance-based and mindfulness-based cognitive–behavioral therapies that are designed to promote greater well-being through targeting these 2 processes.[5-7] Although psychological flexibility and mindfulness are often theorized to be similar but distinct processes, evidence supporting this conceptual position is still limited. As such, the present cross-sectional study aimed to understand the nature of the relationship among mindfulness, psychological flexibility, and psychological distress. In particular, this study quantified the redundant versus unique contributions of these 2 constructs to depression, anxiety, somatization, and general psychological distress.

Psychological Flexibility

Psychological flexibility is roughly conceptualized as an overarching regulation process of (*a*) experiencing the present moment as it is without judgment and avoidance and (*b*) persisting or changing behavior when doing so serves valued-ends.[6] Psychological flexibility has been of great interest in recent years as accumulating evidence has supported its salutary effects. As such, a model has been developed to explain the relationship between psychological flexibility and psychological health. According to the psychological flexibility model,[6] greater psychological well-being is characterized by open and flexible contact with one's own internal and external environment and by commitment to value-consistent activities. Conversely, many forms of psychopathology are conceptualized in terms of diminished psychological flexibility, which is marked by the excess of maladaptive affect/behavior regulations (eg, thought suppression and avoidance) and by the deficits of contingency-sensitive and valued-directed behaviors. Accumulating evidence has shown that psychological flexibility is

[1] Georgia State University, Atlanta, GA, USA

Corresponding Author:
Akihiko Masuda, PhD, Department of Psychology, Georgia State University, Atlanta, GA 30303, USA
Email: amasuda@gsu.edu

positively associated with psychological well-being[3] and inversely associated with a wide range of distress, including depression,[8] anxiety,[9] and general psychological distress.[10-13]

Mindfulness

Mindfulness is another construct that has been widely incorporated into cognitive–behavioral therapies in recent years.[14] Although the definition of mindfulness varies across investigations, it is often conceptualized as an adaptive regulation process of enhanced attention to, and nonjudgmental awareness of, present moment experiences.[15] Mindfulness, when defined in this way, is found to be positively associated with psychological well-being[16,17] and inversely associated with a wide range of psychological outcomes, including depression,[18] anxiety,[18] rumination,[19] and general distress.[19,20] Of particular importance to the present study, studies have consistently found positive associations between mindfulness and psychological flexibility.[21-23]

Conceptually, these findings are interesting as psychological flexibility and mindfulness reflect functional and process-based understandings of psychopathology.[1] As discussed elsewhere,[6,21] the 2 constructs reflect an overarching regulation process of *how* a person contacts and responds to one's internal and external environments in the present moment, not necessarily *what* the person experiences (eg, hopelessness, fear, etc). A growing body of evidence suggests that various forms of psychopathology are best understood in terms of such underlying regulation processes in a given context.[3,4,24]

Relationship Among Psychological Flexibility, Mindfulness, and Distress

As stated above, research has consistently supported the negative association between psychological flexibility and major forms of psychological distress,[6,13] the link between mindfulness and these forms of distress,[2,10,19] and the link between psychological flexibility and mindfulness.[21,22] These findings raise questions about whether mindfulness and psychological flexibility uniquely and separately account for psychological distress or perhaps uniquely and separately account for variance in some forms of psychological distress but not others.

Current Study

Following from previous research,[12,13,21,22] the present cross-sectional study first examined the associations among psychological flexibility, mindfulness, and psychological distress (ie, somatization, depression, anxiety, and general psychological distress) with the expectation that psychological flexibility and mindfulness would be positively associated with one another and negatively associated with all forms of psychological distress. Then, the main study hypothesis was tested by examining the extent to which the 2 processes, psychological flexibility and mindfulness, accounted for unique variance in psychological distress. It was hypothesized that although mindfulness and psychological flexibility are related constructs and would account for some of the same variance in psychological distress, they would each also account for significant unique variances in distress.

Methods

Participants

The current study was conducted at a large, public 4-year university in Georgia. Participants were recruited from undergraduate psychology courses through a Web-based research participant pool. Six-hundred eighty-four participants (n_{Female} = 501; 73% female) completed a survey containing several instruments, with a mean completion time for the survey of approximately 32 minutes (SD = 15.75). As employed in previous studies,[11] those who completed the survey in less than 15 minutes or more than 45 minutes were removed from the study because of the questionable validity of their responses. Five-hundred fifty participants remained (n_{Female} = 413; 75% female). Participants ranged in self-reported age from 16 to 50 years (M = 20.97, SD = 4.96). Additionally, 56 participants who were aged 26 years or older were further excluded based on outlier analysis of age. The final participants consisted of 494 college undergraduates (n_{Female} = 373; 76% female), ranging in age from 16 to 25 years (M = 19.55, SD = 1.64). The ethnic composition of the sample was representative of the university, with 40% (n = 195; n_{Female} = 147) identifying as "European American," 28% (n = 137; n_{Female} = 108) identifying as "African American," 18% (n = 87; n_{Female} = 61) identifying as "Asian American/Pacific Islander," 6% (n = 28; n_{Female} = 21) identifying as "Hispanic American," and 8% (n = 47; n_{Female} = 36) identifying as "bicultural," "other," or "Native American."

Procedure and Measures

The current study was approved and monitored by the university institutional review board. Participants who enrolled in the study were asked to complete an anonymous Web-based survey. The purpose of the study and instructions for completing the survey were presented at the beginning of the survey. Participants anonymously provided demographic information and completed the measures. The following measures were used to assess psychological distress, psychological flexibility, and mindfulness.

Psychological distress. The General Health Questionnaire–12 (GHQ-12)[25] is a measure of global psychological distress. Participants are asked to rate frequency with which they experience common types of distress. Using a Likert-type scale format, items are scored on a 4-point scale, ranging from 0 (*not at all*) to 3 (*much more than usual*), with a total score derived from the sum of all responses (eg, "Have you recently lost much sleep over worry?"). Total scores range from 0 to 36, with higher scores indicating greater distress. A recent study with a nonclinical college undergraduate sample has shown

an adequate Chronbach's α of .88.[26] In the present study, Chronbach's α of this measure was .87.

The Brief Symptom Inventory 18 (BSI-18)[27] is a measure of psychological distress designed to screen for depressive, anxious, and somatic symptoms. The BSI-18 contains 18 items and employs a 5-point Likert-type scale ranging from 0 (*not at all*) to 4 (*extremely*). The global severity index (GSI) score is derived from the sum of all item scores, ranging from 0 to 72, with greater scores suggesting greater psychological distress. Additionally, scores can be obtained for the somatization (6 items; eg, ''faintness''), depression (6 items; eg, ''no interest''), and anxiety (6 items; eg, ''nervousness'') dimensions. The BSI has been shown to be a reliable and valid measure, with an adequate internal consistency (α = .74, .84, .79, and .89, for somatization, depression, anxiety, and GSI, respectively).[27] In the present study, Chronbach's α of somatization, depression, anxiety, and GSI were .78, .85, .82, and .91, respectively.

Psychological flexibility. The Acceptance and Action Questionnaire–16 (AAQ-16)[10] was used to measure psychological flexibility for this study. The AAQ is a 16-item questionnaire designed to assess willingness to accept undesirable thoughts and feelings (eg, ''It is OK to feel depressed or anxious''), while acting in a way that is consistent with one's values and goals (eg, ''I am able to take action on a problem even if I am uncertain of the right thing to do''). The measure employs a 7-point Likert-type scale, ranging from 1 (*never true*) to 7 (*always true*). Total scores range from 16 to 112, with higher scores indicating greater psychological flexibility. Research has indicated that the AAQ has good psychometric properties.[6] In a previous study conducted with a nonclinical sample,[10] α coefficients for this measure ranged from .72 to .79. Chronbach's α of this measure in the present study was .62.

Mindfulness. The Mindful Attention Awareness Scale (MAAS)[15] is a 15-item, self-report measure that is designed to assess the frequency of mindlessness, the opposite of the construct of mindfulness, over time (eg, ''It seems I am running automatic without much awareness of what I'm doing''). Participants rate the extent to which they function mindlessly in daily life, using a 6-point Likert-type scale ranging from 1 (*almost always*) to 6 (*almost never*). Total scores range from 15 to 90, with higher scores denoting greater mindfulness. The MAAS has good Cronbach's α, ranging from .82 to .87.[15] Chronbach's α of MAAS in the present study was .89.

Data Analysis

A series of multiple regressions were conducted to investigate the unique role of mindfulness and psychological flexibility on the general and specific forms of distress. Age, gender (ie, coded as 1 = male, 2 = female), and ethnicity (eg, coded as 0 = non-European American, 1 = European American) were covaried on all regression analyses.

Results

Associations Among Psychological Flexibility, Mindfulness, and Distress

Descriptive statistics and correlations among the study variables are shown in Table 1. Being a female was also associated with greater general distress, greater somatization, greater anxiety, and lower psychological flexibility. There was a positive association between psychological flexibility and mindfulness. Psychological flexibility (AAQ) and mindfulness (MAAS) were negatively associated with all forms of psychological distress (subscales and GSI of BSI-18 and GHQ).

Explaining Variance in Psychological Distress

Age, gender, and ethnicity were included as covariates in all regression analyses (Table 2). Ethnicity predicted anxiety. Being an ethnic minority was associated with greater levels of anxiety. Mindfulness and psychological flexibility both separately accounted for unique variance in general psychological distress measured with the GHQ-12 and BSI-18 GSI. Mindfulness and psychological flexibility also uniquely and separately accounted for the variance in somatization, depression, and anxiety.

Discussion

Employing an ethnically diverse, nonclinical sample of college students, the present study examined whether mindfulness and psychological flexibility separately accounted for unique variance in somatization, depression, anxiety, and general psychological distress. Consistent with previous findings,[13,19,21,23] the study demonstrated that both mindfulness and psychological flexibility were inversely associated with somatization, depression, anxiety, and general psychological distress. The study also extended the extant literature by demonstrating the unique and distinct variance in each of these forms of psychological distress that is accounted for by psychological flexibility and mindfulness.

The current study has important theoretical implications. First, the elucidation of the significant and distinct roles of these mindfulness and psychological flexibility support process-based explanations for psychopathology.[6,24,28] Process-based accounts posit that an individual's responses to internal and external experiences are at least as crucial as the experiences themselves in the onset and maintenance of psychopathology. In particular, the present findings suggest that regulation processes, such as mindful awareness and psychological openness without avoidance, play crucial roles in maintenance of somatization, anxiety, depression, and general distress. Second, their associations with a range of distress also support the transdiagnostic and unifying nature of mindfulness and psychological flexibility, suggesting their applicability to broader clinical contexts.

Table 1. Means, Standard Deviations, Coefficient Alphas, and Zero-Order Correlation Between All Variables[a]

	1	2	3	4	5	6	7	8	9	10
1. Psychological Distress (GHQ)	—									
2. Psychological Distress (BSI-18 GSI)	.64**	—								
3. Somatization (BSI-18 Somatization)	.38**	.80**	—							
4. Depression (BSI-18 Depression)	.68**	.85**	.44**	—						
5. Anxiety (BSI-18 Anxiety)	.54**	.91**	.66**	.67**	—					
6. Psychological Flexibility (AAQ)	−.46**	−.42**	−.24**	−.42**	−.38**	—				
7. Mindfulness (MAAS)	−.43**	−.47**	−.37**	−.42**	−.41**	.39**	—			
8. Age	−.03	−.03	.05	−.00	−.03	.09	.03	—		
9. Gender	.14**	.12**	.12**	.06	.13**	−.14**	−.07	−.06	—	
10. Ethnicity	−.03	.04	.00	.02	.07	.09*	−.01	.07	.00	—
M	12.16	12.85	3.65	4.91	4.29	71.21	57.58			
SD	6.16	10.87	3.81	4.73	4.19	8.93	12.21			
α	.87	.91	.78	.85	.82	.62	.89			

Abbreviations: GHQ, General Health Questionnaire; BSI-18, Brief Symptom Inventory–18 Item; GSI, Global Severity Index; AAQ, Acceptance and Action Questionnaire; MAAS, Mindfulness Attention Awareness Scale; M, Mean; SD, Standard Deviation.
[a] N = 494. *$P < .05$, **$P < .01$.

Clinically, the present study suggests an important role for mindfulness and psychological flexibility in the treatment of psychological distress. This clinical implication is consistent with recent cognitive and behavioral therapies that incorporate these 2 processes into their theories and practices.[14,29] A growing body of evidence has demonstrated that these therapies promote positive clinical outcomes by improving mindfulness and psychological flexibility.[1,6,7] The present study concurs with this research suggesting that interventions should not only target psychological symptoms but should also target underlying processes, such as psychological flexibility and mindfulness, and that studies of interventions that target both mindfulness and psychological flexibility might be fruitful.

The current investigation has several notable limitations. Given the use of a nonclinical sample, the present study should not be treated as a clinical investigation of psychopathology. The number of variables included in the study was intentionally limited to gain a preliminary understanding of the role of mindfulness and psychological flexibility in a range of distress. However, this empirical approach might have undermined the significance of the present findings as recent studies have shown the interaction effects of adaptive and maladaptive regulation strategies on distress. In particular, maladaptive regulation processes, such as rumination and thought suppressions, have been found to be more strongly associated with a range of psychological distress than adaptive regulation strategies[24,30] and that an inverse association between adaptive regulation and distress is established only at high levels of maladaptive strategies.[31] Therefore, it is important to investigate the roles of mindfulness and psychological flexibility along with some of the major maladaptive strategies.

As mentioned elsewhere,[11] the scales used in the present study have not been fully validated across diverse ethnic groups. This concern is particularly to the case with the AAQ-16. Although the AAQ-16 is a most widely used measure of psychological flexibility,[6] it is still unclear whether the measure reflects the construct of psychological flexibility. Given its lower Chronbach's α found in the present study, it is important to investigate the construct validity of this measure across diverse populations further.

Similarly, it should be noted that, given the exclusive use of MAAS, the present conceptualization of mindfulness does not encompass other features that are often included in the definitions of mindfulness.[21] In other words, mindfulness in the present study reflects the present moment awareness, but it does not capture other features, such as the absence of impulsivity, nonjudgment, and purposeful action.[1,21] As the latter features of mindfulness overlap with the construct of psychological flexibility, results of the associations among psychological flexibility, distress, and mindfulness are very likely to change should other measures of mindfulness are used.

External validity of the present study is somewhat limited given that data were derived from college students attending an urban university in the southeastern United States. From a sociocultural perspective, some demographic factors, such as gender role, ethnicity, regional context, and university culture, are likely to shape the variables of the present study in systematic ways. Although gender was covaried out in all analyses, our findings derived from a predominantly female undergraduate sample may not be applicable to more diverse samples, including those that are less educated, more clinical, or older. Nevertheless, the sample was diverse in terms of ethnicity and social economic status.

Finally, perhaps the largest limitation was the reliance on a cross-sectional and correlational design with the use of self-report measures exclusively. The analytic strategy of the present study did not permit elucidating the direction of associations or making causal inferences about functional associations among the constructs of interest. Therefore, the interpretation of the present findings should be made with caution. Conceptually, mindfulness and psychological flexibility are regulation processes referring to individual interactions with

Table 2. Regression Analyses to Investigate the Unique Role of Mindfulness and Psychological Flexibility on Various Forms of Distress[a]

Variable	β	B	SE B	*t*	*P*
General Psychological Distress (GHQ)					
Age	.01	.04	.15	.26	.794
Gender	.07	1.03	.55	1.86	.063
Ethnicity	−.00	−.01	.49	−.03	.980
Mindfulness (MAAS)	−.29	−.15	.02	−7.00	.000
Psychological flexibility (AAQ)	−.34	−.23	.03	−7.98	.000
$R^2 = .29$					
General Psychological Distress (BSI-18 GSI)					
Age	.06	.42	.25	1.65	.099
Gender	.06	1.42	.97	1.46	.144
Ethnicity	.06	1.26	.85	1.48	.138
Mindfulness (MAAS)	−.36	−.32	.04	−8.68	.000
Psychological flexibility (AAQ)	−.28	−.34	.05	−6.68	.000
$R^2 = .29$					
Somatization (BSI-18 Somatization)					
Age	.08	.18	.10	1.84	.066
Gender	.08	.72	.37	1.92	.055
Ethnicity	.00	.03	.33	.08	.934
Mindfulness (MAAS)	−.33	−.11	.01	−7.20	.000
Psychological flexibility (AAQ)	−.11	−.05	.02	−2.26	.019
$R^2 = .16$					
Depression (BSI-18 Depression)					
Age	.03	.09	.11	.76	.447
Gender	−.00	−.03	.43	−.07	.947
Ethnicity	.04	.45	.38	1.18	.240
Mindfulness (MAAS)	−.30	−.12	.02	−7.03	.000
Psychological flexibility (AAQ)	−.32	−.17	.02	−7.36	.000
$R^2 = .26$					
Anxiety (BSI-18 Anxiety)					
Age	.06	.15	.10	1.52	.129
Gender	.08	.73	.39	1.89	.060
Ethnicity	.09	.79	.34	2.32	.021
Mindfulness (MAAS)	−.30	−.10	.02	−6.94	.000
Psychological flexibility (AAQ)	−.27	−.13	.02	−6.20	.000
$R^2 = .24$					

Abbreviations: GHQ, General Health Questionnaire; BSI, Brief Symptom Inventory; GSI, Global Severity Index; AAQ, Acceptance and Action Questionnaire; MAAS, Mindfulness Attention Awareness Scale.
[a] N = 494.

internal and external experiences in a given moment in a given context. For this reason, the exclusive reliance on self-reported measures is unlikely to capture the dynamic and ongoing nature of these 2 processes.

Conclusion

This study addresses a novel question; employs a large, ethnically and economically diverse sample; and uses multiple measures of psychological distress. It extends the existing literature on regulation processes underlying a range of distress by suggesting that mindfulness and psychological flexibility separately and independently account for unique variance in general and specific forms of distress. The current study also suggests that it is beneficial to continue investigating the role of mindfulness in psychological flexibility and their associations with a range of distress, particularly with treatment studies and studies that can bear out causal relationships among these variables.

Authors' Note

The present cross-sectional study was conducted at Georgia State University, Atlanta, GA. The study has not been presented elsewhere.

Author Contributions

AM wrote the first draft of the article and finalized the article. ECT extensively revised and edited the article. All authors contributed to and approved the final draft of the article.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical Approval

The present study was reviewed, approved, and monitored by the institutional review board at the university with which the authors of the article are affiliated.

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