Comparing Self-Compassion, Mindfulness, and Psychological Inflexibility as Predictors of Psychological Health

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Abstract Self-compassion, mindfulness, and psychological inflexibility, constructs associated with mindfulness-based interventions, have demonstrated associations with multiple aspects of psychological health. However, a very limited body of research has analyzed the relative predictive strength among mindfulness-related constructs. Regression analyses were performed to determine the common and unique variance in psychological health predicted by these constructs and to compare their relative predictive strength in a nonclinical sample of 147 undergraduate students at a Mid-Atlantic university. Consistent with previous research, self-compassion demonstrated a stronger ability than single-factor mindfulness to predict variance in psychological health. However, results were mixed when a multifaceted measure of mindfulness was considered. Self-compassion predicted greater variance than multifaceted mindfulness when prediction was based on one total score, but not when individual subscales were analyzed. Psychological inflexibility predicted greater variance than did self-compassion for negative indicators of psychological health. Results suggest that self-compassion and psychological inflexibility may demonstrate greater associations with psychological health than single scores of mindfulness and that important predictive power is lost, particularly from the nonreactivity facet, when multifaceted mindfulness is consolidated into a single score.

Keywords Mindfulness · Self-compassion · Experiential avoidance · Well-being · Affect · Depression

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Introduction

Research suggests that trait mindfulness and its facets are associated with multiple aspects of psychological health (Keng et al. 2011), such as social anxiety (Rasmussen & Pidgeon 2011), depressive symptomatology (Cash & Whittingham 2010), and positive and negative affect (Brown & Ryan 2003), and that mindfulness-based interventions (MBIs) consistently produce improvements to negative psychological functioning (Hofmann et al. 2010). The cultivation of mindfulness has also been connected to increases in positive aspects of mental health (Nyklicek & Kuijpers 2008). However, questions remain over the best way to operationalize mindfulness and the extent of its conceptual and predictive overlap with related constructs, such as self-compassion and psychological inflexibility.

Conceptions of mindfulness vary broadly, as reflected by differences in how this construct is assessed (Bergomi et al. 2012; Grossman 2008). For example, the widely used Mindful Attention Awareness Scale (MAAS; Brown & Ryan 2003) reflects a single-factor construct of mindfulness and is determined by the degree to which respondents fail to endorse the presence of mindlessness, or the lack of present awareness. A different measure, the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al. 2006), presents an expanded conception of mindfulness in which the construct is divided into five components. Nonreactivity to inner experience, observing, acting with awareness, describing, and nonjudging of experience are assessed by individual subscales, allowing respondents to endorse varying levels of particular elements of mindfulness. Thus, the precise meaning of mindfulness can differ substantially depending upon the specific measure a study employs.

In addition, meta-analytic research on self-compassion has suggested that this closely related construct is also strongly related to psychopathology (MacBeth & Gumley 2012). Measured by the Self-Compassion Scale (SCS; Neff 2003), self-compassion is formulated as a composite of the presence of self-kindness, common humanity, and mindfulness along with the absence of self-judgment, isolation, and over-identification (a lack of distance from emotion). As a whole, self-compassion represents an empathic, equanimical view of one's own faults as part of the universal human experience. Multiple studies have found significant inverse associations between self-compassion and anxiety, depression, and several other negative emotions (Neff 2003; Neff et al. 2007; Raes 2010; Ying 2009) and positive associations with positive psychological health (Hollis-Walker & Colosimo 2011; Neff et al. 2007). Intervention research also suggests that self-compassion commonly increases and accompanies improvement in positive and negative symptoms during MBIs (Ortner et al. 2007; Orzech et al. 2009; Shapiro et al. 2005, 2007), and may even mediate symptom improvement (Kuyken et al. 2010).

In addition, the concepts of mindfulness and self-compassion also intersect with the construct of psychological inflexibility/experiential avoidance. Psychological inflexibility denotes an emphasis on managing psychological reactions over performing actions consistent with deeply held values, often in an attempt to avoid unpleasant emotions (Bond et al. 2011). A central target of Acceptance and Commitment Therapy (ACT) interventions (Hayes et al. 2012), psychological inflexibility has consistently demonstrated strong associations with measures of psychological harm and inverse associations with measures of psychological health (Bond et al. 2011; Hayes et al. 2006). Longitudinal studies have also demonstrated that psychological inflexibility predicts mental health over time (Bond & Bunce 2003) and that it mediates improvements in ACT and cognitive–behavioral therapy (Flaxman & Bond 2010).

While multiple studies have separately documented the predictive strength of mindfulness, self-compassion, and psychological inflexibility, scant research has compared their relative abilities to predict aspects of psychological health. Van Dam et al. (2011) compared a single-factor mindfulness measure (MAAS) and the total self-compassion score of the SCS in predicting symptom severity and quality of life in a sample diagnosed with mixed anxiety and depression. Results revealed self-compassion to be an overall stronger predictor than mindfulness. However, as the researchers noted, the results may have been influenced by the specific measure of mindfulness chosen. Hollis-Walker and Colosimo (2011) analyzed self-compassion and mindfulness as predictors of psychological well-being in a nonclinical sample of undergraduate students and age-matched community members. When regressed simultaneously, subscales of both the SCS and FFMQ were found to predict variance in psychological well-being to similar degrees, with subscales of both measures contributing unique predictive utility.

The current study aimed to further disentangle the relationship between mindfulness and related constructs by comparing their relative strength in predicting psychological functioning. Scores on both single-factor and multifaceted measures of mindfulness were used to compare the predictive utility of two different conceptualizations of mindfulness and to compare their predictive strength with that of self-compassion and psychological inflexibility. Measures of psychological health spanned an array of negative functioning (anxiety, depressive symptomatology, unhappiness, and negative affect) and positive functioning (well-being, happiness, positive affect, and psychological quality of life).

Based on prior studies that found associations between these predictors and multiple aspects of psychological health, we expected that single-factor mindfulness, multifaceted mindfulness, self-compassion, and psychological inflexibility would exhibit significant individual associations with all measures of psychological health, although simultaneous analysis would reveal substantial overlap in the variance predicted by these related variables. In addition, consistent with Van Dam et al. (2011), we expected that self-compassion would exhibit greater predictive strength than mindfulness across positive and negative measures when single scores of the constructs were compared. Comparisons between these predictors and psychological inflexibility were exploratory. Based on research indicating that some facets of mindfulness correlate with psychological symptoms and well-being more strongly than others (Baer et al. 2008), we expected that mindfulness would exhibit much greater strength when individual subscales were analyzed as compared to a single score. Further, consistent with the results of Hollis-Walker and Colosimo (2011) for the variable of well-being, we expected that the advantage of self-compassion over mindfulness for predicting negative and positive psychological health would be eliminated when individual subscales of both measures were analyzed.

Method

Participants

Participants consisted of 147 undergraduate students, aged 17–23 years old, at a Mid-Atlantic university. Table 1 presents characteristics of the sample with respect to demographics, psychological symptoms, and exposure to meditation and related practices. Although approximately half of the participants reported previous exposure to yoga, meditation, or similar contemplative activities, only a very small minority of participants described current participation in a meditation practice of any type.

Table 1 Description of study participants

	n	%
Demographics		
Gender		
Female	104	71
Male	43	29
Ethnicity		
Caucasian	115	78
Hispanic	9	6
Asian/Pacific Islander	8	5
African American	6	4
Other	9	6
Age Range	17–23	
Mental Health		
Anxiety (BAI)		
Moderate or more (16+)	51	35
Severe (26+)	24	16
Depression (BDI-SF)		
Moderate-to-severe w/ high sensitivity (10+)	33	22
Moderate-to-severe w/ high specificity (14+)	12	8
Moderate anxiety or depression w/ high sens.	63	43
Severe anxiety or depression w/ high spec.	29	20
Meditation experience		
Ever participated in yoga, meditation, or similar contemplative activities?		
No	75	51
Yes	72	49
Number of times currently meditating per week		
0	134	91
<1–1	5	3
2	6	4
3+	2	1
Minutes currently meditating per sitting		
N/A	134	91
1–15	6	4
16–30	5	3
31+	2	1

BAI categories as per Beck and Steer (1993); BDI-SF categories as per Furlanetto et al. (2005)

BAI Beck Anxiety Inventory, *BDI-SF* Beck Depression Inventory-Short Form

Procedure

After the study received Institutional Review Board approval, recruitment flyers were posted in the psychology department and distributed in introductory psychology classes. Students earned research points in return for completing booklets of questionnaires, which were counterbalanced in one of three orders. Interested students signed up for pre-scheduled slots and completed the booklets in groups.

Measures

Mindfulness

Two separate measures of mindfulness were included.

Mindful Attention Awareness Scale (Brown & Ryan 2003) The MAAS is a single-factor mindfulness measure composed of 15 items that describe ways in which a person may exhibit the absence of mindfulness, such as inattentiveness or states of automatic pilot. Respondents rate each item's frequency on a six-point Likert-type scale ranging from 1 (almost always) to 6 (almost never), and higher scores are associated with greater mindfulness. The measure has demonstrated good convergent and discriminant validity and very good internal consistency with a nonclinical sample (Brown & Ryan 2003).

Five Facet Mindfulness Questionnaire (Baer et al. 2006) The FFMQ consists of 39 items that are rated on a five-point Likert-type scale ranging from 1 (never or very rarely true) to 5 (very often or always true), and which measure five interrelated but distinct aspects of mindfulness. The five facets consist of nonreactivity to inner experience, observing, acting with awareness, describing, and nonjudging of experience. These five subscales demonstrate differential correlations with a variety of psychological variables, and internal consistency ranges from adequate to good in nonclinical samples (Baer et al. 2006).

Self-Compassion

The Self-Compassion Scale (Neff 2003) is composed of 26 items that measure respondents' attitudes toward themselves with respect to personal flaws, failures, and painful events. Responses are made on a five-point Likert-type scale ranging from 1 (almost never) to 5 (almost always). Items are divided into six subscales that are composed of positive and negatively worded items regarding three facets of self-compassion. The positive scales consist of self-kindness, common humanity, and mindfulness, while the negative scales include self-judgment, isolation, and over-identification. The measure also yields a total self-compassion score in addition to the component subscale scores. The SCS has demonstrated good convergent and discriminant validity and test–retest reliability when administered to a nonclinical sample, with the six subscales demonstrating good internal consistency (Neff 2003).

Psychological Inflexibility

The Acceptance and Action Questionnaire-II (AAQ-II; Bond et al. 2011) measures a single-factor construct of psychological inflexibility. The questionnaire consists of

seven items, each of which are rated on a seven-point Likert-type scale ranging from 1 (never true) to 7 (always true). The revised measure was designed to improve internal consistency problems with the original AAQ (Hayes et al. 2004) and demonstrates good convergent and discriminant validity, internal consistency, and test–retest reliability (Bond et al. 2011).

Negative Psychological Functioning

Two measure of negative functioning were used.

Beck Anxiety Inventory (BAI; Beck et al. 1988a) The BAI consists of 21 items that list common symptoms of anxiety. The severity of each symptom over the past month is reported on a four-point Likert-type scale ranging from 0 (not at all) to 3 (severely—I could barely stand it). A total score above 15 indicates moderate anxiety and a score above 25 indicates severe anxiety (Beck & Steer 1993). The measure exhibits convergent validity, test–retest reliability, and very good internal consistency. In addition, the BAI demonstrates discriminant validity and only moderate correlations with self-report measures of depression when compared to other anxiety measures (Beck et al. 1988a).

Beck Depression Inventory-Short Form (BDI-SF; Beck & Beck 1972) The BDI-SF measures depressive symptomatology and contains the 13 cognitive-affective items of the original Beck Depression Inventory (Beck et al. 1961). For each item, respondents choose from a list of four statements describing the severity of depressive symptoms over the previous 2 weeks, with scores ranging from 0 to 3, and total scores ranging from 0 to 39. The scale exhibits correlations with the long form of 0.89 and above, as well as good internal consistency (Beck et al. 1988b). The short form has been validated as a screen for depression in medical inpatients, in which moderate-to-severe depression is indicated by a score of 10 with high sensitivity and a score of 14 with high specificity (Furlanetto et al. 2005).

Positive psychological functioning

Two measures of positive functioning were used.

Satisfaction with Life Scale (SWLS; Diener et al. 1985) The SWLS is a 5-item questionnaire measuring cognitive–judgmental estimates of global life satisfaction, as opposed to affective conceptions. Statements about life satisfaction are rated on a seven-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). The measure demonstrates convergent validity, good test–retest reliability, and adequate internal consistency (Diener et al. 1985). In addition, the SWLS has demonstrated associations ($r > 0.50$)

with third-party ratings of life satisfaction by peers and family members (Pavot et al. 1991).

World Health Organization Quality of Life-BREF (Skevington et al. 2004) This 26-item measure assesses quality of life across four domains of psychological, physical, and social functioning, and environment. A five-point scale is used to report the frequency of a range of experiences and the extent to which they have been satisfied with a variety of areas over the past month. Results for only the six-item psychological subscale were analyzed. The measure has demonstrated good internal consistency, discriminant validity, and acceptable construct validity (Skevington et al. 2004).

Positive and Negative Psychological Functioning

Finally, two measures that include assessment of both positive and negative functioning were employed in this study.

Fordyce Emotion Questionnaire (Fordyce 1988) This four-item measure examines overall levels of and frequency of happiness. Respondents rate overall happiness on a scale from 0 (extremely unhappy) to 10 (extremely happy). In addition, respondents give estimates of the percentage of time they are in a happy, unhappy, and neutral state. The measure exhibits very strong convergent and discriminant validity with other measures of well-being and unhappiness, respectively, as well as good test–retest reliability for periods as long as 1 month (Fordyce 1988).

Positive and Negative Affect Schedule (PANAS; Watson et al. 1988) The 20-item PANAS measures positive and negative affect. Items consist of 10 positive and 10 negative descriptors of affect, and respondents answer how frequently they experience each emotion on a five-point Likert-type scale ranging from 1 (very slightly or not at all) to 5 (extremely). The two subscales demonstrate convergent and discriminant validity, exhibit very good internal consistency, and are only moderately inversely correlated with each other (Watson et al. 1988).

Statistical Approach

To determine the predictors' individual predictive strength, Pearson correlations were calculated between the total score of each predictor (single-factor mindfulness, multifaceted mindfulness, self-compassion, and psychological inflexibility) and each measure of negative psychological health (anxiety, depressive symptomatology, unhappiness, and negative affect) and positive psychological health (well-being, happiness, positive affect, and psychological quality of life).

Once the individual predictive power of each construct of interest had been determined, simultaneous regressions were run to determine the overlap in prediction between constructs, the predicted variance unique to a specific predictor, and the stronger of the two predictors. These regressions (three in total) were performed for each measure of psychological health using total scores of two predictors (single-factor mindfulness and self-compassion, multifaceted mindfulness and self-compassion, psychological inflexibility, and self-compassion). This yielded the total variance predicted by the combined predictors (R^2), the amount of predicted variance common or redundant to both predictors (common variance), and the unique variance predicted by each predictor above and beyond the other (sr^2, semipartial correlation squared).

Finally, after analyzing total scores, a similar analysis was performed using FFMQ and SCS subscales as predictors. This allowed for predicted variance to be compared between total score and subscale predictors and between the subscales of the two relevant measures. Three simultaneous regressions were performed for each measure of psychological health using the individual subscales of the FFMQ and SCS as predictors. This process was performed for the five FFMQ facets, the six SCS subscales, and all 11 predictors together. These analyses yielded the total variance predicted by the subscales of both measures combined (R^2), the variance predicted by subscales of each measure alone (R^2), and the unique variance predicted by each measure subscale above and beyond others and (sr^2). All calculations were performed using IBM SPSS Statistics 19.

Results

Correlational Analysis

The individual predictive strength for each predictor and measure of psychological health are presented in Table 2 (to maintain consistency with later analyses, correlation values were converted to R^2). Every predictor was significantly correlated with every measure of psychological health, and each association was in the expected direction.

Multiple Regression Analysis Using Total Scores

Three sets of regressions were run for each variable of psychological health. The first included single-factor mindfulness and self-compassion as predictors, the second included multifaceted mindfulness and self-compassion, and the third included psychological inflexibility and self-compassion. The variance inflation factor (VIF) did not surpass 1.60 for predictors in any regression, indicating no substantial biases due to multicollinearity (Cohen et al. 2003). For each set of regressions, Table 3 presents the total

Table 2 Correlations (in R^2) of total scores of mindfulness, self-compassion, and psychological inflexibility with psychological health

	MAAS	FFMQ-T	SCS-T	AAQ-II
Negative psychological health				
BAI	0.159**	0.112**	0.160**	0.291**
BDI-SF	0.128**	0.151**	0.276**	0.295**
PANAS-N	0.212**	0.209**	0.274**	0.301**
FEQ-U	0.057**	0.089**	0.144**	0.217**
Positive psychological health				
PANAS-P	0.035*	0.064**	0.071**	0.065**
SWLS	0.038*	0.120**	0.197**	0.230**
FEQ-H	0.073**	0.045*	0.158**	0.203**
WHOQOL-PSYCH	0.071**	0.140**	0.293**	0.240**

R^2 percentage of variance predicted, *MAAS* Mindful Attention Awareness Scale, *SCS-T* Self-Compassion Scale-total score, *FFMQ-T* Five Facet Mindfulness Questionnaire-total score, *AAQ-II* Acceptance and Action Questionnaire-II, *BAI* Beck Anxiety Inventory, *BDI-SF* Beck Depression Inventory-Short Form, *PANAS-N* Negative Affect Scale of Positive and Negative Affect Schedule, *FEQ-U* frequency of unhappiness on Fordyce Emotion Questionnaire, *SWLS* Satisfaction with Life Scale, *FEQ-H* frequency of happiness on Fordyce Emotion Questionnaire, *WHOQOL-PSYCH* psychology scale on World Health Organization Quality of Life-BREF

*$p<0.05$, **$p<0.01$

variance predicted by the combined predictors (column 1), the portion of that predicted variance that was common to both predictors (column 2), and the portion of variance that was unique to each predictor (columns 3 and 4).

Single-Factor Mindfulness and Self-Compassion

Similar to the analysis by Van Dam et al. (2011), single-factor mindfulness was initially compared to self-compassion. The combined SCS and MAAS total scores significantly predicted all negative and positive scores of psychological health for anxiety ($F(2, 143)=20.50$, $p<0.001$), depressive symptomatology ($F(2, 144)=30.48$, $p<0.001$), negative affect ($F(2, 144)=37.25$, $p<0.001$), frequency of unhappiness ($F(2, 142)=12.64$, $p<0.001$), positive affect ($F(2, 144)=6.07$, $p=0.003$), life satisfaction ($F(2, 144)=17.69$, $p<0.001$), frequency of happiness ($F(2, 142)=14.47$, $p<0.001$), and psychological quality of life ($F(2, 143)=28.55$, $p<0.001$). All betas were in expected directions. Across all measures of psychological health, 34 % of the predicted variance was common to both predictors, 10 % was unique to single-factor mindfulness, and 56 % was unique to self-compassion. The SCS predicted more variance for each measure of mental health except anxiety. In addition, the SCS predicted a significant amount of unique variance for every measure, whereas single-factor mindfulness provided unique contributions to variance only for anxiety, depressive symptomatology, and negative affect.

Table 3 Common and unique contributions of self-compassion, mindfulness, and psychological inflexibility as predictors of psychological health variance

Single-factor mindfulness and self-compassion

	MAAS+SCS-T (R^2)	Common variance	MAAS (sr^2)	SCS-T (sr^2)
Negative psychological health				
BAI	0.223**	0.096**	0.063**	0.064**
BDI-SF	0.297**	0.107**	0.021*	0.169**
PANAS-N	0.341**	0.144**	0.068**	0.129**
FEQ-U	0.151**	0.050**	0.007	0.095**
Positive psychological health				
PANAS-P	0.078**	0.029*	0.006	0.043*
SWLS	0.197**	0.038**	0.000	0.159**
FEQ-H	0.169**	0.061**	0.012	0.096**
WHOQOL-PSYCH	0.285**	0.068**	0.001	0.216**

Multifaceted mindfulness and self-compassion

	FFMQ-T+SCS-T (R^2)	Common variance	FFMQ-T (sr^2)	SCS-T (sr^2)
Negative psychological health				
BAI	0.184**	0.087**	0.024*	0.072**
BDI-SF	0.297**	0.130**	0.021*	0.147**
PANAS-N	0.325**	0.158**	0.052**	0.116**
FEQ-U	0.160**	0.074**	0.015	0.071**
Positive psychological health				
PANAS-P	0.090**	0.045**	0.019	0.027*
SWLS	0.218**	0.099**	0.021	0.098**
FEQ-H	0.157**	0.045**	0.000	0.112**
WHOQOL-PSYCH	0.298**	0.120**	0.014	0.164**

Psychological inflexibility and self-compassion

	AAQ-II+SCS (R^2)	Common variance	AAQ-II (sr^2)	SCS-T (sr^2)
Negative psychological health				
BAI	0.299**	0.152**	0.139**	0.008
BDI-SF	0.356**	0.216**	0.079**	0.061**
PANAS-N	0.358**	0.217**	0.085**	0.057**
FEQ-U	0.233**	0.129**	0.088**	0.016
Positive psychological health				
PANAS-P	0.085**	0.051**	0.013	0.020
SWLS	0.267**	0.161**	0.070**	0.037**
FEQ-H	0.228**	0.132**	0.070**	0.025*
WHOQOL-PSYCH	0.322**	0.191**	0.038**	0.093**

R^2 percentage of total variance predicted by both predictors combined, common variance percentage of predicted variance redundant between both predictors, sr^2 semipartial correlation squared (i.e., percentage of variance predicted by one predictor above and beyond the other)

*$p<0.05$, **$p<0.01$

Multifaceted Mindfulness and Self-Compassion

Since self-compassion had been a superior predictor to single-factor mindfulness, self-compassion was next compared to a total score of multifaceted mindfulness to determine if the FFMQ's broader scope would improve relative strength. The combined SCS and FFMQ total scores significantly predicted all scores of psychological health for anxiety ($F(2, 143)=16.13$, $p<0.001$), depressive symptomatology ($F(2, 144)=30.49$, $p<0.001$), negative affect ($F(2, 144)=34.63$, $p<$ 0.001), frequency of unhappiness ($F(2, 142)=13.47$, $p< 0.001$), positive affect ($F(2, 144)=7.13$, $p=0.001$), life satisfaction ($F(2, 144)=20.07$, $p<0.001$), frequency of happiness ($F(2, 142)=13.26$, $p<0.001$), and psychological quality of life ($F(2, 143)=30.37$, $p<0.001$). All betas were also in expected directions. Across all measures of psychological health, 44 % of the predicted variance was common to both predictors, 10 % was unique to multifaceted mindfulness, and 47 % was unique to self-compassion. Similar to the earlier single-factor mindfulness comparison, self-compassion also

predicted more variance than the multifaceted mindfulness total score for all measures of psychological health. Also similar to the earlier comparison, the multifaceted mindfulness total score predicted unique variance only for anxiety, depression, and negative affect.

Psychological Inflexibility and Self-Compassion

Since self-compassion had been superior to both mindfulness predictors, it was next compared to psychological inflexibility. The combined SCS and AAQ-II total scores significantly predicted all measures of psychological health for anxiety ($F(2, 143)=30.49$, $p<0.001$), depressive symptomatology ($F(2, 144)=39.72$, $p<0.001$), negative affect ($F(2, 144)= 40.17$, $p<0.001$), frequency of unhappiness ($F(2, 142)= 21.56$, $p<0.001$), positive affect ($F(2, 144)=6.67$, $p=0.002$), life satisfaction ($F(2, 144)=26.29$, $p<0.001$), frequency of happiness ($F(2, 142)=20.94$, $p<0.001$), and psychological quality of life ($F(2, 143)=34.02$, $p<0.001$). All betas again were in expected directions. Across all measures of psychological health, 58 % of the predicted variance was common to both predictors, 27 % was unique to psychological inflexibility, and 15 % was unique to self-compassion. The SCS failed to provide significant unique predictions for anxiety, unhappiness, and positive affect. Psychological inflexibility predicted unique variance for all measures except positive affect and predicted more variance than self-compassion for all measures of negative, but not positive, psychological health. Across all measures of negative health, 57 % of the predicted variance was common to both predictors, 31 % was unique to psychological inflexibility, and 11 % was unique to self-compassion. However, predictive strength was roughly equivalent across measures of positive health, with 59 % of the predicted variance common to both predictors, 21 % unique to psychological inflexibility, and 19 % unique to self-compassion.

Multiple Regression Analysis Using Subscale Scores

Three sets of regressions were again run for each variable of psychological health. The first included the five facets of the FFMQ as predictors, the second included the six subscales of the SCS, and the third included all 11 predictors. The VIF was below 3.35 for predictors in any regression, still well below the threshold for excessive multicollinearity (Cohen et al. 2003).

Multifaceted Mindfulness Subscales vs. Total Score

The FFMQ subscales significantly predicted all negative and positive scores of psychological health for anxiety ($F(5, 140)= 6.14$, $p<0.001$), depressive symptomatology ($F(5, 141)=9.80$, $p<0.001$), negative affect ($F(5, 141)=13.82$, $p<0.001$), frequency of unhappiness ($F(5, 139)=5.71$, $p<0.001$), positive

affect ($F(5, 141)=2.10$, $p=0.057$), life satisfaction ($F(5, 141)= 4.89$, $p<0.001$), frequency of happiness ($F(5, 139)=3.46$, $p= 0.006$), and psychological quality of life ($F(5, 140)=5.36$, $p< 0.001$; see percentage variance for each in column 2 of Table 4). The total variance predicted by the FFMQ subscales increased by 54 % across all measures compared to the variance predicted by the total score alone, specifically, 34 % across positive measures and 67 % across negative measures.

Self-Compassion Subscales vs. Total Score

When the SCS subscales were used, the predictors predicted all negative and positive scores of psychological health for anxiety ($F(6, 139)=6.71$, $p<0.001$), depressive symptomatology ($F(6, 140)=10.01$, $p<0.001$), negative affect ($F(6, 140)= 11.40$, $p<0.001$), frequency of unhappiness ($F(6, 138)=4.86$, $p<0.001$), positive affect ($F(6, 140)=2.42$, $p=0.029$), life satisfaction ($F(6, 140)=6.35$, $p<0.001$), frequency of happiness ($F(6, 138)=5.29$, $p<0.000$), and psychological quality of life ($F(6, 139)=11.25$, $p<0.001$; see percentage variance for each in column 3 of Table 4). The SCS subscales predicted only 18 % more variance across all measures than the total score did, specifically, 14 % more across positive measures and 20 % more across negative measures.

Multifaceted Mindfulness and Self-Compassion Subscales

Finally, when all 11 subscales were used, the FFMQ and SCS combination predicted all but one measure of psychological health, including anxiety ($F(11, 134)=4.49$, $p<0.001$), depressive symptomatology ($F(11, 135)=7.10$, $p<0.001$), negative affect ($F(11, 135)=8.98$, $p<0.001$), frequency of unhappiness ($F(11, 133)=3.79$, $p<0.001$), frequency of

Table 4 Predictive strength of individual subscales of self-compassion and multifaceted mindfulness on psychological health

	FFMQ facets+SCS scales (R^2)	FFMQ facets (R^2)	SCS scales (R^2)
Negative psychological health			
BAI	0.269**	0.180**	0.225**
BDI-SF	0.366**	0.258**	0.300**
PANAS-N	0.422**	0.329**	0.328**
FEQ-U	0.239**	0.170**	0.175**
Positive psychological health			
PANAS-P	0.117	0.073	0.094*
SWLS	0.245**	0.148**	0.214**
FEQ-H	0.228**	0.111**	0.187**
WHOQOL-PSYCH	0.363**	0.161**	0.327**

R^2 percentage of variance predicted by subscales

*$p<0.05$, **$p<0.01$

happiness ($F(11, 133)=3.57$, $p<0.001$), life satisfaction ($F(11, 135)=3.97$, $p<0.001$), and psychological quality of life ($F(11, 134)=6.95$, $p<0.001$; see percentage variance predicted by the combined subscales in column 1 of Table 4). Consistent with the earlier analysis of total scores, self-compassion subscales predicted more variance than mindfulness facets did for all measures of positive health. However, the self-compassion and mindfulness subscales predicted very similar amounts of variance for negative measures. Although the 11 subscales had predicted a significant amount of variance for 35 out of the 44 potential correlations of negative psychological health when analyzed on an individual basis, very little of this variance turned out to be unique to one predictor. At the individual predictor level, only the nonreactivity subscale of the FFMQ predicted a significant amount of unique variance above and beyond other predictors for all four of these negative measures (see column 3 of Table 5). The nonjudging and acting with awareness subscales also predicted one negative measure each, and the isolation subscale of the SCS significantly predicted unique variance for negative affect and unhappiness. For each measure of negative health, the sum of all unique variance attributed to the five FFMQ facets equaled or exceeded the unique variance attributed to the six SCS subscales.

Discussion

As expected, when analyzed individually, single-factor mindfulness, multifaceted mindfulness, self-compassion, and psychological inflexibility all exhibited significant relations with each variable of psychological health. The majority of these relations were moderate-to-large in size, indicating relatively strong associations between these mindfulness-related constructs and variables of mental health. In addition, as expected, these associations were characterized by a large degree of overlap. For the three head-to-head analyses of construct total scores, a third to well above half of the variance predicted by the combination was common to both constructs. The levels of common variance between single-factor mindfulness and self-compassion were very similar to those observed in the treatment-seeking sample studied by Van Dam et al. (2011).

Also expected and consistent with this earlier research, self-compassion total score was superior to single-factor mindfulness total score as a predictor of psychological health. For measures of negative health except anxiety, self-compassion uniquely predicted approximately 2–14 times the variance that single-factor mindfulness did, and the MAAS failed to significantly predict any unique variance for positive measures. Thus, results provide further evidence that a compassionate orientation toward one's own thoughts and experiences may better predict psychological health than do attention to and awareness of the present moment (Van Dam et al. 2011). However, the fact that the SCS and MAAS predicted similar levels of variance in anxiety was unexpected and contrasted with the earlier study. It is possible that the MAAS better predicts anxiety in nonclinical populations such as in this study than in the clinical population sampled in the previous research. More generally, it is also possible that severity of mental health may moderate relations between mindfulness-related constructs and anxiety or other mental health variables. Due to the comparatively low symptom severity of this study's sample, associations between the constructs of interest and psychological health may differ from those found in typical participants in a mindfulness-based intervention. Further, research on trauma-exposed adults has suggested that a complex relationship may exist between mindfulness and psychopathology, where high mindfulness may be confined to individuals with low psychopathology but low mindfulness may be found across individuals reporting a range of severities (Bernstein et al. 2011). Thus, the range of mindfulness scores may be wider for nonclinical samples than for clinical ones.

The predictive advantage of self-compassion over mindfulness also held when multifaceted mindfulness was consolidated into a single score. Despite the added breadth of the FFMQ, the SCS total score still predicted two to seven times as much unique variance for negative measures as did the FFMQ total score. The multifaceted mindfulness score also similarly failed to provide a significant unique contribution to the variance in any positive measure. While the FFMQ predicted slightly more total variance than the MAAS did on an individual basis, this advantage did not hold when the SCS was included with the FFMQ. Baer et al. (2006) described the risks of collapsing a multifaceted construct into a single score, noting that the strong relation of an individual facet to an external variable may be diluted or lost among other facets that have weaker relations or none at all. In addition, confirmatory factor analysis of the FFMQ found a poor fit when tested as a single-factor model, and the observe facet failed to fit within a hierarchical structure except when it was administered to a sample with meditation experience (Baer et al. 2006, 2008). Thus, despite its limitations, a narrowly defined construct of one mindfulness aspect may possess certain advantages over a single score of multiple mindfulness components.

It also appears that these and prior results demonstrating the predictive superiority of self-compassion over mindfulness cannot be attributed solely to weaknesses or failures specific to the MAAS alone (e.g., Christopher et al. 2009; Van Dam et al. 2010). Numerous challenges have been identified for the development of mindfulness measures in general, including the lack of external, objective criteria, potential confusion over semantic interpretation, and the introspection required to recollect mental states (Grossman

Table 5 Predictive strength of individual subscales of mindfulness and self-compassion on measures of negative psychological health

	β	sr^2
Beck Anxiety Inventory		
FFMQ-nr	−0.214	0.028*
FFMQ-nj	−0.076	0.004
FFMQ-ds	−0.077	0.005
FFMQ-aw	−0.072	0.004
FFMQ-ob	0.040	0.001
SCS-sk	−0.004	0.000
SCS-sj	0.123	0.005
SCS-ch	0.085	0.004
SCS-is	0.129	0.008
SCS-md	0.042	0.001
SCS-oi	0.162	0.011
Beck Depression Inventory—Short Form		
FFMQ-nr	−0.195	0.023*
FFMQ-nj	−0.147	0.016
FFMQ-ds	0.026	0.001
FFMQ-aw	−0.158	0.018*
FFMQ-ob	0.037	0.001
SCS-sk	−0.188	0.016
SCS-sj	0.212	0.013
SCS-ch	−0.054	0.002
SCS-is	0.104	0.005
SCS-md	0.027	0.000
SCS-oi	−0.080	0.003
Negative Affect Scale—Positive and Negative Affect Schedule		
FFMQ-nr	−0.242	0.036**
FFMQ-nj	−0.166	0.020*
FFMQ-ds	−0.088	0.006
FFMQ-aw	−0.148	0.016
FFMQ-ob	0.088	0.006
SCS-sk	0.002	0.000
SCS-sj	0.011	0.000
SCS-ch	0.081	0.004
SCS-is	0.228	0.025*
SCS-md	−0.095	0.005
SCS-oi	0.146	0.009
Fordyce Emotion Questionnaire—Frequency of Unhappiness		
FFMQ-nr	−0.245	0.037*
FFMQ-nj	−0.155	0.018
FFMQ-ds	−0.005	0.000
FFMQ-aw	−0.081	0.005
FFMQ-ob	0.083	0.006
SCS-sk	−0.179	0.015
SCS-sj	−0.179	0.010
SCS-ch	0.057	0.002
SCS-is	0.294	0.043**
SCS-md	0.040	0.001
SCS-oi	0.050	0.001

β standardized regression coefficient, R^2 percentage of variance predicted by subscale, sr^2 semipartial correlation squared (i.e., percentage of variance predicted by subscale above and beyond all others), nr nonreactivity to inner experience, nj nonjudging, ds describing, aw acting with awareness, ob observing, SCS Self-Compassion Scale, sk self-kindness, sj self-judgment, ch common humanity, is isolation, md mindfulness, oi over-identification

*p<0.05, **p<0.01

2008). In comparison, self-compassion is more readily definable, and items may be more easily accessible to respondents (Van Dam et al. 2011).

In the exploratory analysis, psychological inflexibility predicted more variance than did the SCS (and thus more variance than total scores of the MAAS and FFMQ) in each of the negative measures of mental health. In fact, the SCS was rendered entirely redundant for the prediction of anxiety and unhappiness when regressed with the AAQ-II. While the AAQ-II's margin of advantage for the other two negative aspects of psychological health was narrow, results suggest that psychological inflexibility is at least as strong as self-compassion when predicting the variance of all negative mental health measures included in the study. The same cannot be said for all positive aspects of mental health, but the large amount of variance predicted by the AAQ-II compared very favorably to that predicted by MAAS and FFMQ total scores. In fact, psychological inflexibility predicted on average two to three times the total variance in positive mental health predicted by mindfulness scores. There is a growing body of evidence that psychological inflexibility may mediate the effects of processes such as coping and emotion regulation (Kashdan et al. 2006) and predict therapeutic outcomes (Berking et al. 2009). Findings in the present study support continued research of psychological inflexibility as a predictor and potential mediator, ideally comparing it against other possible mediators.

As expected, when individual subscales of the FFMQ were included as predictors, the measure predicted considerably more variance than when one total score was used. Thus, it appears that a great deal of predictive utility may be forfeited (approximately 70 % more variance for variables of negative mental health) when the FFMQ is consolidated into a single total score. The total score of the SCS, on the contrary, approximated the predictive strength of its individual scales much better. Baer et al. (2008) previously found incremental validity for four of the five mindfulness facets in the prediction of psychological well-being, suggesting significant contributions from the individual scales. While Christopher and Gilbert (2010) found less incremental validity when subscales of the Kentucky Inventory of Mindfulness Skills (Baer et al. 2004) and the MAAS were analyzed as predictors of satisfaction and depression, results may have been affected by the inclusion of other nonmindfulness predictors.

More broadly, the present findings appear to suggest that the link between mindfulness and mental health is stronger when the former is conceptualized as having multiple facets. As Herbert and Forman (2011) note, researchers continue to debate whether mindfulness is more accurately represented as a construct composed of a single factor (Brown & Ryan 2003) or two or more dimensions (Herbert & Cardacciotto 2005). In the present study, the FFMQ facet of nonreactivity predicted

unique variance for each measure of negative mental health when analyzed with all 10 other predictors, suggesting that this facet may be particularly valuable. Specifically, items on this subscale assess a tendency to notice one's difficult thoughts without excessively reacting to them. When considered along with the previously described findings for psychological inflexibility, these results provide further support that acceptance-related aspects of MBIs may be particularly linked to mental health (Herbert et al. 2010).

In line with expectations, when the SCS and FFMQ subscales were compared for negative indicators of mental health, the SCS subscales did not exhibit a clear advantage. An analysis of individual predictors suggested that the individual facets of the FFMQ typically predicted more unique variance than did the SCS subscales when all 11 predictors were combined. Consistent with Van Dam et al. (2011), the SCS isolation subscale demonstrated unique variance for two measures of negative health, whereas the self-judgment scale lost much of its unique power when analyzed with the FFMQ predictors. This makes conceptual sense, since several items of the FFMQ touch upon self-judgment but not isolation.

Contrary to expectations and previous results for psychological well-being (Hollis-Walker & Colosimo 2011), however, the SCS subscales still predicted greater variance for all measures of positive mental health than did the FFMQ facets. Overall, the mindfulness measures and subscales demonstrated stronger inverse associations with negative measures than they did positive associations with positive measures. Similar patterns were observed during other studies with the MAAS (Brown & Ryan 2003; Ortner et al. 2007). In addition, Sears and Kraus (2009) found significant improvements in negative affect but not positive affect following participation in a mindfulness intervention, while Thompson and Waltz (2007) found that positive affect significantly fell for new meditators following a mindfulness intervention. Schroevers and Brandsma (2010), on the other hand, found that a mindfulness intervention led to improvements in both negative and positive affect, but that these respective improvements were related to different components of mindfulness. Future studies should further explore whether mindfulness-related constructs may be differentially related to negative and positive affect, and whether they may be associated more strongly with reduced negative affect than with improved positive affect.

The present study was characterized by several limitations. As discussed earlier, participants consisted of nonclinical participants, the majority of whom exhibited stronger scores of psychological health than most individuals seeking treatment. There are indications that symptom severity may influence the nature of relations between mindfulness and mental health (Bernstein et al. 2011), and that the results of this study may not generalize to more distressed populations. It is essential that similar studies be conducted with samples

reporting more severe psychopathology. Similarly, a substantial proportion of participants consisted of Caucasian women falling between the ages of 17 and 23. This is in no way representative of the general population or participants seeking treatment in a mindfulness-based intervention. Results may differ for a sample exhibiting a more full range of ages, different educational background, more equal gender distribution, or diverse racial makeup.

Further, the sample size may be considered relatively small in relation to the large number of measures employed, and differences in the magnitude of individual associations were not statistically significant. Thus, the results observed could be influenced heavily by random fluctuation. Finally, the results are cross-sectional in nature, and thus causality cannot be inferred from any of the associations discussed. In addition to future research with samples that are more representative of the community and treatment seekers, longitudinal and experimental studies should explore potential causality between the mindfulness-related constructs studied and changes in psychological health and the role of these different constructs as mediators of change in MBIs.

In summary, results suggest that the mindfulness-related constructs of self-compassion and psychological inflexibility may predict variance in psychological health better than total scores from two different mindfulness measures. However, it appears that the predictive strength of mindfulness increases dramatically when it is analyzed as a multifaceted construct, and therefore caution is advised when consolidating multifaceted mindfulness (here represented by the FFMQ) into a single score. Thus, the relation between mindfulness and mental health and the relative strength of this relation appear to depend both on the conceptualization of mindfulness and on the way it is assessed.

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