

Measuring the Immeasurables: Development and Initial Validation of the Self-Other Four Immeasurables (SOFI) Scale Based on Buddhist Teachings on Loving Kindness, Compassion, Joy, and Equanimity

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Abstract Multiple measures exist that examine the attentional aspects of meditation practice, but measurement of the compassion component is relatively understudied. This paper describes the development and initial validation of a scale designed to measure application of the four immeasurable qualities at the heart of Buddhist teachings: loving kindness, compassion, joy and acceptance toward both self and others. Our analyses suggest four distinct subscales: positive qualities toward self, positive qualities toward others, negative qualities toward self and negative qualities toward others. Initial examination of reliability and validity showed high internal consistency for the subscales as well as strong concurrent, discriminant, and construct validity. We believe the Self-Other Four Immeasurables (SOFI) scale has broad utility for research on mindfulness, positive psychology, and social psychology.

Keywords Mindfulness · Meditation · Compassion · Assessment · Positive psychology

1 Introduction

The burgeoning scientific, clinical, and secular interest in mindfulness meditation has produced numerous efforts to define and measure what mindfulness is (Baer et al. 2004, 2006; Brown and Ryan 2003; Chadwick et al. 2005 *Responding mindfully to unpleasant thoughts and images: Reliability and validity of the mindfulness questionnaire*, Unpublished manuscript; Feldman et al. 2004 *Development, factor structure, and initial validation of the Cognitive and Affective Mindfulness Scale*, Unpublished manuscript; Hayes and Feldman 2004; Lau et al. 2006), as well as many excellent intervention studies substantiating its benefits for outcomes including pain management, immune function, brain activity in areas associated with positive emotion, decreasing ruminative thoughts, and preventing relapse of depression (e.g., Davidson et al. 2003; Jain et al. 2007; Kabat-Zinn et al. 1985, 2003; Shapiro et al. 2005, 2007; Teasdale et al. 2000). Although

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researchers have created scales that capture the awareness and non-judgment aspects of mindfulness (see Baer et al. 2006 for a review), the positive qualities such as loving kindness and compassion are relatively understudied. In the positive psychology movement in recent decades, researchers and clinicians have recognized the need to measure the presence of positive emotion as well as the absence of negative emotions for optimal psychological well-being and health (for example with the Positive and Negative Affect Scale; PANAS; Watson et al. 1988). This knowledge about the importance of measuring the positive aspects of meditation experience such as compassion may inform a promising future direction for mindfulness research.

In clinical intervention contexts, mindfulness typically is a collection of practices that emphasize paying attention in the present moment in a kind, curious, and nonjudgmental way (e.g., Kabat-Zinn 1990). Thus, mindfulness has at least two important components: *that* we pay attention and *how* we pay attention. One metaphor for mindfulness is a bird, with one wing of awareness and the other wing of compassion. Without both of these practices in balance, the bird cannot fly. Traditional Buddhist teachings such as the Four Noble Truths begin by acknowledging the inherent presence in of suffering in life (or *dukkha*), but also teach that mindfulness of the pleasant times (or *sukkhā*) can produce liberating insights (Moffitt 2008).

In addition to becoming enlightened through awareness, Buddhist teachings may cultivate The Four Immeasurables (also referred to as the Divine Abodes, Boundless States, or Brahmaviharas). These qualities are called loving kindness (*metta*), compassion (*karuna*), joy (*mudita*), and equanimity (*upekkha*). In addition to the qualities themselves, theorists discuss the so-called far enemies of these qualities, including hatred, cruelty, jealousy, and anxiety, respectively. More complex are the so-called near enemies, or qualities that can mimic the desired quality, but are superficial renderings such as pity or feeling overwhelmed instead of compassion, or apathy and indifference instead of acceptance. Many practices involving the four immeasurables start by cultivating these qualities toward the self, and then also extend them to friends, neutral individuals, difficult people, and all sentient beings.

These qualities such as loving kindness and compassion would be useful to assess in meditation research because they could be important mediators for some of the observed beneficial effects of mindfulness. For example, one potential mechanism for effects of mindfulness in treating depression could be a change in compassion toward oneself and a concomitant change in cognitive distortions that are hallmarks of depression. Although the fundamental philosophy and intent of mindfulness may be to evoke clarity and awakening through observation rather than change per se, this practice nonetheless may promote adaptation by helping people tolerate distressing emotions and cultivate cognitive qualities such as friendliness, compassion, joy, and acceptance that may mitigate negativistic thinking.

Despite definitions of mindfulness as including a stance of kindness and compassion, existing measures appear to emphasize awareness and absence of reaction. Baer et al. (2006) recently conducted an analysis of the facet structure of mindfulness using all of the items compiled from five different mindfulness questionnaires: The Mindfulness Attention Awareness Scale (MAAS; Brown and Ryan 2003), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al. 2004), the Cognitive and Affective Mindfulness Scale (CAMS; Feldman et al. 2004 *Development, factor structure, and initial validation of the Cognitive and Affective Mindfulness Scale*, Unpublished manuscript; Hayes and Feldman 2004), and the Mindfulness Questionnaire (MQ; Chadwick et al. 2005 *Responding mindfully to unpleasant thoughts and images: Reliability and validity of the mindfulness questionnaire*, Unpublished manuscript). Their conclusion was that mindfulness is a multi-faceted construct comprising non-reactivity, observing, awareness, describing, and non-judging.

The Toronto Mindfulness Scale (TMS; Lau et al. 2006) includes two factors of decentering and curiosity (including items mentioning openness and acceptance) but does not explicitly measure loving kindness, compassion, or joy. Only one measure to our knowledge has directly attempted to capture compassion with the Self-Compassion Scale (SCS; Neff 2003). This 26-item measure taps perceptions of self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. However, it only focuses on the self, whereas meditation compassion practices also extend to others. In addition, the items are a bit lengthy to read, making it somewhat burdensome if it were included in a battery of outcome assessments.

Given the tradition of teachings on compassion, with relative lack of measures, the overall goal of the present study was to create a scale of compassion toward self and others that would be relatively easy to administer and include positive as well as and negative aspects of the mindfulness experience. We anticipate that such a scale would be useful not only in mindfulness studies, but also in broader research areas such as positive psychology, peace studies, and caretaking in health settings. Modeling our scale on the format of the PANAS, we used the theoretical qualities of the Four Immeasurables (i.e., loving kindness, compassion, joy, and equanimity) as well as their opposites (e.g., hatred, cruelty) and subtle imposters (e.g., pity, apathy). Our proposed name for the scale is “Self-Other Four Immeasurables” (SOFI).

Four specific goals were to: (1) *Develop the measure*. (2) *Explore a potential factor structure*. For example, we were curious as to whether the scale would have factors that fall along the four qualities of loving kindness, compassion, joy, and equanimity. Alternatively, factors might emerge for ratings toward self versus other, and/or for the qualities and their near and far enemies. (3) *Determine concurrent and discriminant validity*. Regarding concurrent validity, we anticipated existing measures of self-compassion would correlate strongly with ratings toward the self in our scale, but not necessarily with the ratings towards others. In addition, we anticipated that a measure of positive and negative emotion would correlate with ratings of positive and negative qualities in our scale, but not entirely account for the variance in ratings. Regarding discriminant validity, we wanted to ensure that a tendency to respond in a socially desirable way would not entirely account for high scores on our measure. (4) *Examine construct validity*. Specifically, if meditation practice increases compassion toward self and others, we would expect to see differences on our measure between samples with and without extensive meditation experience.

2 Method

2.1 Participants and Procedure

The 124 primary participants were students at a small liberal arts college who voluntarily completed surveys in a classroom setting. The classes ranged from freshman to senior level. Of participants, 48% were male and 52% female with an average age of 21.11 (SD = 5.83). Self-identified ethnic backgrounds for participants were White/Non-Hispanic (74%), Native American (14%), Hispanic/Latino/a (6%) and other ethnicities (African American, Caribbean, Asian, 6%). Socioeconomic background was varied with 15% reporting fathers with a high school education or less, and 30% reporting fathers with an advanced degree. Mother’s education level was reported as 17% with high school education or less, and 17% with advanced degrees.

An additional sample of experienced meditators was surveyed at a weekly meditation group at a community meditation center to assess construct validity. Surveys were

distributed to approximately 30 individuals at the end of a lecture and meditation session, and 12 (40%) were returned via mail. The final group of participants from this sample included 10 females (83%) and 2 males (17%) with an average age of 45.67 (SD = 13.43). To respect the atmosphere and generosity of the community center, we were unable to obtain demographic data on non-responders compared to volunteers.

2.2 Measures

2.2.1 *Self-Other Four Immeasurables (SOFI)*

We developed items for the scale based on the theoretical qualities of the four immeasurables (Nhat Hahn 1991). A chart describing the qualities and their near and far enemies appears in Appendix A. We developed adjectives to capture as many of the qualities as possible to include in the scale. We developed more than one adjective for some qualities (e.g., apathy, indifferent) to see which words would be most interpretable to participants and yield the best scale structure. We did not develop an adjective for the near enemy of joy (i.e., hypocrisy, or spaced out bliss) because we believed it would be difficult for participants to interpret. This initial version produced 16 pairs of adjectives. We modeled the format of the scale after the PANAS, with participants rating each adjective as they applied “toward myself” and “toward others.” Participants rated the item for jealous toward others only as it did not make conceptual sense to rate jealousy toward the self. The final version of the scale after factor analyses yielded eight pairs of adjectives and appears in Appendix B.

2.2.2 *Marlowe–Crowne 13-item Short Form (M–C 13)*

This 13-item survey is a reliable and valid short form of the original Marlowe–Crowne Social Desirability Scale (Crowne and Marlowe 1960; Reynolds 1982). Participants rated items as “true” or “false,” with higher scores indicating greater tendency to respond in a socially desirable manner. We used this survey as a measure of discriminant validity in an attempt to distinguish responses on our scale from global tendencies to respond in a socially desirable manner.

2.2.3 *Cognitive and Affective Mindfulness Scale-Revised (CAMSR, 10-item version)*

We used the 10-item version of this measure that taps attention, present-focus, awareness, and acceptance aspects of mindfulness. As the scale authors suggest, we used the 10-item version to avoid possible contamination from the additional 2 items in the 12-item version that may overlap with emotional worry about the future and rumination about the past. Participants rate items on a four-point scale, with higher total scores suggesting more mindfulness. The scale has demonstrated good internal consistency and concurrent and discriminant validity (Feldman et al. 2007). We used this measure to explore concurrent and discriminant validity with our scale.

2.2.4 *Positive and Negative Affect Scale (PANAS)*

The PANAS is a 20-item scale, with 10 positive and 10 negative affective descriptors that has demonstrated sound internal consistency and convergent and discriminant validity (Watson et al. 1988). Participants rated their feelings concerning the affective descriptors during the past week. Responses were scored on a five-point scale ranging from “very

slightly or not at all” to “extremely.” Higher scores indicate higher affect. We used this measure to explore concurrent and discriminant validity with our scale.

2.2.5 Self-Compassion Scale (SCS)

The SCS is a 26-item measure tapping self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. Participants respond to various items about “how I typically act toward myself in difficult times” on a 5-point scale, with higher total scores indicating greater self-compassion. The scale has demonstrated good reliability and validity (Neff 2003). We anticipated that this scale would correlate strongly with ratings toward the self in our scale, but not necessarily with ratings toward others.

3 Results

3.1 Factor Analyses

Exploratory factor analyses using maximum likelihood extraction with varimax rotation and Kaiser normalization were conducted on all ratings. Six factors emerged that accounted for 64.91% of the total variance. Descriptive statistics for the scale items are shown in Table 1 and factor loadings and proportions of the variance that they explain are shown in Table 2. As other researchers have used as criteria (e.g., Tedeschi and Calhoun

Table 1 Descriptive statistics for SOFI scale items and other measures

	Mean	Standard deviation	Skewness	Kurtosis
Friendly—self	3.60	0.92	−0.75	0.33
Friendly—others	3.99	0.77	−0.83	1.47
Joyful—self	3.37	1.09	−0.28	−0.46
Joyful—others	3.43	1.11	−0.47	−0.24
Accepting—self	3.49	1.11	−0.39	−0.71
Accepting—others	3.82	0.89	−0.44	−0.16
Compassionate—self	3.07	1.15	−0.08	−0.88
Compassionate—others	3.57	1.14	−0.52	−0.45
Mean—self	1.52	0.86	1.67	2.41
Mean—others	1.42	0.72	2.06	5.26
Hateful—self	1.69	0.97	1.46	1.59
Hateful—others	1.57	0.94	1.94	3.62
Angry—self	2.06	1.06	1.07	0.71
Angry—others	1.99	0.90	0.80	0.33
Cruel—self	1.43	0.88	2.32	5.08
Cruel—others	1.31	0.70	2.51	6.02
Marlowe–Crowne Social Desirability	6.32	2.81	0.04	−0.86
Self compassion	3.14	0.64	−0.21	−0.10
CAMS-R	27.11	6.90	3.21	22.73
PANAS positive	35.54	6.47	−0.17	−0.43
PANAS negative	21.74	7.86	0.97	0.52

Table 2 Initial factor loadings (varimax rotation)

	Positive self/other	Negative		Overwhelmed self/other	Apathy self/other	Judgmental self/other
		Other	Self			
Friendly—self	0.54					
Friendly—others	0.61					
Joyful—self	0.61					
Joyful—others	0.70					
Accepting—self	0.63					
Accepting—others	0.70					
Compassionate—self	0.70					
Compassionate— others	0.70					
Mean—self			0.82			
Mean—others		0.69				
Hateful—self			0.61			
Hateful—others		0.76				
Angry—self			0.46			
Angry—others		0.55				
Cruel—self			0.74			
Cruel—others		0.72				
Overwhelmed—self				0.67		
Overwhelmed— others				0.67		
Apathetic—self					0.91	
Apathetic—others					0.85	
Judgmental—self						0.89
Judgmental—others						0.50
Eigenvalue	3.85	2.77	2.73	1.97	1.71	1.24
% of variance	17.48	12.63	12.42	8.97	7.76	5.66

1996), these items generally had factor loadings of greater than 0.50 on one of the six factors and not more than 0.40 on any other factor. The first factor was comprised of the positive qualities of compassion, friendliness, acceptance and joy toward both self and other. Negative qualities toward self (i.e., hateful, angry, cruel and mean) loaded on one factor, and negative qualities toward others loaded on another. The three additional factors were single quality factors. Overwhelmed about self and other loaded on one factor, as did apathy toward self and others and judgment about self and others. These last three factors together accounted for 22.39% of the total variability and were qualities associated with the middle (near enemy) of the positive and negative scale (neither the original quality itself, nor its polar opposite). The utility of a factor that measures a single quality may be limited, so we chose to delete the near enemy items and simplify the scale to include only the strongly positive and negative qualities.

A subsequent factor analysis with varimax rotation and Kaiser normalization revealed that the first three factors from the original analyses remained stable after deletion of the near enemies, with eigenvalues greater than 1.00. As a group they accounted for 59.63% of the total variance (see Table 3).

Table 3 SOFI factor loadings (varimax rotation) positive and negative only

	Positive self/other	Negative	
		Self	Other
Friendly—self	0.55		
Friendly—others	0.57		
Joyful—self	0.68		
Joyful—others	0.74		
Accepting—self	0.66		
Accepting—others	0.69		
Compassionate—self	0.75		
Compassionate—others	0.69		
Mean—self		0.74	
Mean—others			0.71
Hateful—self		0.79	
Hateful—others			0.75
Angry—self		0.69	
Angry—others			0.57
Cruel—self		0.65	
Cruel—others			0.70
Eigenvalue	3.80	3.21	2.53
% of variance	23.76	20.09	15.78

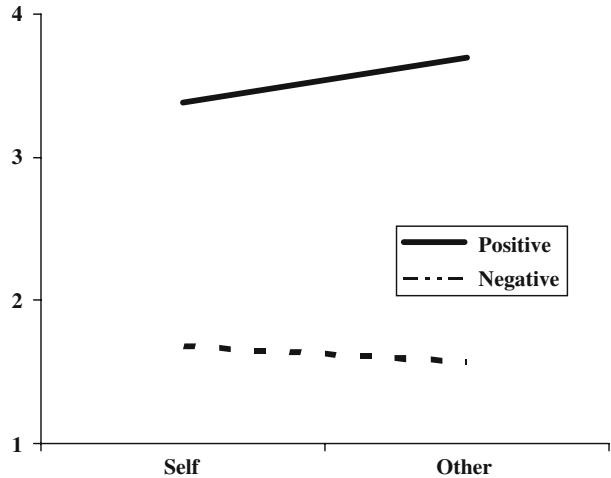
3.2 Self versus Other Ratings

Ratings of negative qualities toward self and others clearly loaded on different factors, whereas ratings for positive qualities loaded on the same factor for self and other. Although self and other ratings of the positive qualities were highly correlated ($r = 0.67$), dependent sample t -tests revealed that ratings of positive qualities toward others ($M = 3.70$, $SD = 0.78$) were significantly higher than those toward the self ($M = 3.38$, $SD = 0.89$; $t(126) = 5.37$, $p < 0.001$). This difference suggests some utility in treating ratings of positive qualities toward self and other as separate factors. In addition, a two-way repeated measures ANOVA showed strong main effects of both valence (positive or negative) $F(1,125) = 316.45$, $p < 0.001$, and of target (self or other) $F(1,125) = 14.81$, $p < 0.001$, as well as a significant interaction of these factors $F(1,125) = 16.11$, $p < 0.001$. Interaction results, shown in Fig. 1 suggest that ratings toward other are both more strongly positive and less negative than are ratings directed toward self. These results, combined with the principle components analyses, suggest a four-factor scale design, with positive and negative qualities for feelings toward self and other as distinct measures.

3.3 Internal Consistency

Cronbach's alphas were calculated for the four proposed subscales and the entire measure. High internal consistency was found for each of the subscales: Positive Self ($\alpha = 0.86$); Negative Self ($\alpha = 0.85$); Positive Other ($\alpha = 0.80$); Negative Other ($\alpha = 0.82$). In addition, corrected item total correlations ranged from $r = 0.54$ to 0.76 , showing strong

Fig. 1 SOFI ratings for positive and negative qualities by self and other



consistency between subscale items. Pearson correlations among the four subscales ranged from $r = 0.67$ for positive self and other ratings to $r = -0.20$ for self negative correlated with other positive ratings. This range of correlations indicates that while there is some shared variance, there are also unique contributions for each factor. Internal consistency was less strong when measured across all items ($\alpha = 0.60$), suggesting that this measure might best be used as subscales instead of an overall measure.

3.4 Concurrent and Discriminant Validity

Once the 2 (self/other) \times 2 (positive/negative qualities) factor structure for SOFI was determined, we examined the extent to which these factors converged with similar measures, and diverged from disparate constructs. The correlation matrix for these measures with our subscales appears in Table 4. Factors loadings from principal components analyses with varimax rotation for these measures and our subscales appear in Table 5.

Factor analyses using maximum likelihood extraction with varimax rotation converged on two factors for these variables, which accounted for 60.71% of the variance. The first factor consisted of self and other positive qualities from the SOFI, CAMS-R, PANAS positive and Self Compassion Scale. The second factor consisted of the self and other negative SOFI qualities along with the PANAS negative.

The Marlowe–Crowne Social Desirability Scale did not load strongly on either factor. It also did not correlate significantly with ratings of positive qualities, and did not correlate strongly with ratings of negative qualities. Although we cannot ignore the possible impact of social desirability, these findings suggest that it does not entirely account for responses.

The Self Compassion Scale, as expected, correlated strongly with self qualities, both positive and negative. However, as expected, it correlated less strongly to ratings for others (accounting for less than 20% of the variance on these measures). The CAMS-R was moderately correlated with our measures, accounting for only 6–15% of the variance in our factors. As expected the PANAS negative correlated strongly with negative self ratings, accounting for 39% of the variance, but less consistently with the other subscales (6–15% of the variance). Likewise, the PANAS positive correlated strongly with positive self

Table 4 Correlations between SOFI subscales and other measures

	Positive		Negative	
	Self	Other	Self	Other
Marlowe–Crowne Social Desirability	0.17	0.16	−0.28*	−0.26*
Self compassion	0.67***	0.44***	−0.63***	−0.43***
CAMS-R	0.39***	0.24**	−0.35***	−0.29**
PANAS positive	0.47***	0.39**	−0.25*	−0.18
PANAS negative	−0.39**	−0.24*	0.62***	0.38**
Age	0.15	0.15	−0.19*	−0.15
Mother's education	0.13	0.17	−0.02	0.00
Father's education	0.14	0.10	−0.04	0.04

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5 Concurrent and divergent validity measures of SOFI: factor loadings (varimax rotation)

	Factor 1	Factor 2
Positive self (SOFI)	0.82	
Positive others (SOFI)	0.68	
Negative self (SOFI)		0.78
Negative others (SOFI)		0.73
Marlowe–Crowne Social Desirability		
Self compassion	0.78	
CAMS-R	0.66	
PANAS positive	0.77	
PANAS negative		0.86
Eigenvalue	2.94	2.52
% of variance	32.67	28.04

ratings, accounting for 22% of the variance, but less to other ratings (3–15%). Thus, while there is some overlap in the expected directions with affective ratings on the PANAS, emotion does not entirely account for results on our measure.

SOFI subscales were not strongly correlated with age, although this measure may be limited due to the relatively small age range in our sample, or SES as measured via reported mother's education level and father's education level.

3.5 Construct Validity

To the extent that meditation increases positive qualities and reduces negative qualities, we expect to see differences between our non-meditating participants and those who meditate regularly. We compared the subset of our original participants who reported no meditation ($n = 104$) to a new group of participants who were surveyed at a weekly meditation group ($n = 12$). These participants reported an average of 6.8 years ($SD = 5.5$) of meditation experience and an average of 119.8 min ($SD = 46.1$) of meditation per week. As shown in Table 6, independent t -tests showed significant differences for each subscale except for

Table 6 Average SOFI subscale ratings for meditating and non-meditating samples

SOFI subscale	Meditators M (SD)	Non-meditators M (SD)	<i>t</i>	<i>p</i>
Positive self	3.75 (0.60)	3.32 (0.86)	2.22	0.04*
Positive other	3.79 (0.53)	3.65 (0.75)	0.64	0.52
Negative self	1.25 (0.24)	1.57 (0.62)	3.53	0.001**
Negative other	1.31 (0.36)	1.66 (0.77)	2.72	0.01**

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

that measuring positive qualities expressed towards others. Those who meditated regularly had higher ratings for positive self and lower negative ratings for self and other.

4 Discussion

Findings support the development and initial validation of the Self-Other Four Immeasurables (SOFI) Scale. Although many existing measures assess the awareness, non-reactivity, and acceptance components of mindfulness (Baer et al. 2004, 2006; Brown and Ryan 2003; Chadwick et al. 2005 *Responding mindfully to unpleasant thoughts and images: Reliability and validity of the mindfulness questionnaire*, Unpublished manuscript; Feldman et al. 2004 *Development, factor structure, and initial validation of the Cognitive and Affective Mindfulness Scale*, Unpublished manuscript; Hayes and Feldman 2004; Lau et al. 2006), our measure is a unique contribution to the literature by assessing loving kindness, compassion, and joy. Whereas previous measures appear to focus on the fact that we pay attention, our focuses primarily on *how* we pay attention. By attempting to measure these previously “immeasurable” qualities, we facilitate study of both wings of mindfulness, attention and compassion.

Regarding factor structure, the SOFI scale yielded four distinct subscales not captured by current measures of mediation experience. The SOFI assessed the four immeasurables discussed in Buddhist teachings (i.e., loving kindness, compassion, joy and equanimity). However, the factor structure did not converge along these constructs. Instead, they appeared to converge for ratings of the positive qualities themselves versus their negative far enemies, and ratings of self versus other. Research on the PANAS suggests that positive and negative emotions are distinct (Watson et al. 1988), and it is clear we think differently about self and others (Ross et al. 1977). Further work with highly trained Buddhist meditators may show differences between the four immeasurables, but with beginning meditators it appears that the differences in how we think about self and other, as well as positive versus negative qualities are primary. Ratings of three near enemies (judgment, apathy, and overwhelmed) emerged as three additional factors, but were omitted from the final scale given the complexity of the concepts and the limited utility of individual-item subscales. Future researchers may choose to explore the usefulness of including these constructs in more depth. For example, the near enemy of judgment (especially toward the self) may be an important quality in studying cognitive distortions in depression.

In addition to assessing the aspirational qualities associated with mindfulness, our scale is a unique contribution to the literature in that it assesses ratings toward others as well as

the self. The ratings toward self on our measure demonstrated good concurrent validity with the Self Compassion Scale (Neff 2003), but adds to this existing measure by including ratings of compassion toward others. Our scale has the added benefit of being relatively brief and simple for participants read and to complete, making it feasible for use in assessment batteries.

As Watson et al. (1988) found in developing the PANAS, the factor structure for our scale suggests that the presence of positive qualities is not the same as the absence of negative qualities. In addition, while ratings on our scale correlate to some extent with affective ratings on the PANAS, they do not uniformly account for all or even most of the variance in our results. Thus, our scale is not simply another measure of current emotional state. Likewise, ratings on our scale are not driven by a tendency to respond in a socially desirable manner.

The CAMS-R (Feldman et al. 2007) was moderately correlated with our measure, suggesting that our scale is related to, but still distinct from this existing mindfulness measure. Future research is needed to determine the extent to which our scale would be distinct from other existing mindfulness measures. A related question is whether our measure is better conceptualized as a state measure or a trait measure. While the CAMS-R is conceptualized as a trait measure, our measure in its current form and timeframe anchors may appear to be a state measure. However, one could argue that the capacity for loving kindness, compassion, and joy is related to other known traits. Future research comparing our scale with the Toronto Mindfulness Scale (a state measure) may be useful.

Regarding construct validity, our scale appeared to distinguish individuals with no meditation experience from individuals with extensive meditation experience. Future research with larger samples of experienced meditators is warranted to replicate these findings.

In summary, our research suggests a promising new assessment tool that makes a unique contribution to the existing literature, and has good initial internal consistency as well as concurrent, discriminant, and construct validity. Nonetheless, a number of limitations warrant discussion. First, our sample is relatively small to draw firm conclusions about the factor structure of our scale. Our current sample relies heavily on a student population, and our non-student community sample was small. A larger non-student sample would be helpful to confirm factor structure, validity, and generalizability. Test-retest reliability in a sample that is expected not to change dramatically over time is a logical next step, as is looking for changes over time in people who are in the initial stages of developing a mindfulness practice. Second, participants rated items with qualities for self and other presented in pairs. The question of whether similar results would emerge if the qualities were presented for self and other on separate pages is worthy of future research.

Despite these limitations, developing a scale that measures qualities such as loving kindness, compassion, and joy would be useful not only in mindfulness research, but also in broader areas of positive psychology, peace studies and caretaking in healthcare settings. The scale also has utility in research on self and identity as well as attitudes towards others. Programs designed to enhance understanding of others and reduce prejudice, hatred and bullying may benefit by measuring positive as well as negative aspects of self and other judgments. Measuring compassion toward self and other, along with negative feelings and behaviors, in a quick, easy to administer form assists the flight of mindfulness research specifically, and has many potential applications within positive psychology.

Appendices

Appendix A Adjectives used in preliminary scale to measure theoretical qualities of the four immeasurables

Quality	Pali	Near enemies	Far enemies
LOVING KINDNESS	<i>Metta</i>		
Friendly		Judgmental	Hateful Angry
COMPASSION	<i>Karuna</i>		
Compassionate		Pitying Overwhelmed	Cruel Mean
JOY	<i>Mudita</i>		
Joyful			Jealous
EQUANIMITY	<i>Upekkha</i>		
Accepting		Indifferent Apathetic	Preoccupied

Appendix B SOFI scale

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Friendly—toward myself	1	2	3	4	5
Friendly—toward others	1	2	3	4	5
Hateful—toward myself	1	2	3	4	5
Hateful—toward others	1	2	3	4	5
Angry—with myself	1	2	3	4	5
Angry—with others	1	2	3	4	5
Joyful—for myself	1	2	3	4	5
Joyful—for others	1	2	3	4	5
Accepting—toward myself	1	2	3	4	5
Accepting—toward others	1	2	3	4	5
Cruel—toward myself	1	2	3	4	5
Cruel—toward others	1	2	3	4	5
Compassionate—toward myself	1	2	3	4	5
Compassionate—toward others	1	2	3	4	5
Mean—toward myself	1	2	3	4	5
Mean—toward others	1	2	3	4	5

This scale consists of a number of words that describe different thoughts, feelings, and behaviors. Read each item and then circle the appropriate answer next to that word

Indicate to what extent you have thought, felt, or acted this way toward yourself and others *during the past WEEK*

References

- Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: The Kentucky inventory of mindfulness skills. *Assessment, 11*, 191–206. doi:[10.1177/1073191104268029](https://doi.org/10.1177/1073191104268029).
- 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*, 27–45. doi:[10.1177/1073191105283504](https://doi.org/10.1177/1073191105283504).
- 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*, 822–848. doi:[10.1037/0022-3514.84.4.822](https://doi.org/10.1037/0022-3514.84.4.822).
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*(4), 349–354. doi:[10.1037/h0047358](https://doi.org/10.1037/h0047358).
- Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S., et al. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine, 65*, 564–570. doi:[10.1097/01.PSY.0000077505.67574.E3](https://doi.org/10.1097/01.PSY.0000077505.67574.E3).
- Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Mindfulness and emotion regulation: The development and initial validation of the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment, 29*(3), 177–190. doi:[10.1007/s10862-006-9035-8](https://doi.org/10.1007/s10862-006-9035-8).
- Hayes, A. M., & Feldman, G. (2004). Clarifying the construct of mindfulness in the context of emotion regulation and the process of change in therapy. *Clinical Psychology: Science and Practice, 11*, 255–262. doi:[10.1093/clipsy/bph080](https://doi.org/10.1093/clipsy/bph080).
- Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, L., et al. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine, 33*(1), 11–21. doi:[10.1207/s15324796abm3301_2](https://doi.org/10.1207/s15324796abm3301_2).
- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your mind and body to face stress, pain, and illness*. New York: Delacorte.
- Kabat-Zinn, J., Lipworth, L., & Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine, 8*(2), 163–190. doi:[10.1007/BF00845519](https://doi.org/10.1007/BF00845519).
- Kabat-Zinn, J., Wheeler, E., Light, T., Skillings, A., Scharf, M., Cropey, T., et al. (2003). Part II: Influence of a mindfulness meditation-based stress reduction intervention on rates of skin clearing in patients with moderate to severe psoriasis undergoing phototherapy (UVB) and photochemo-therapy (PUVA). *Constructivism in the Human Sciences, 8*(2), 85–106.
- Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., et al. (2006). The Toronto mindfulness scale: Development and validation. *Journal of Clinical Psychology, 62*(11), 1445–1467. doi:[10.1002/jclp.20326](https://doi.org/10.1002/jclp.20326).
- Moffitt, P. (2008). Beyond happiness. *Yoga Journal, (210)*, 107–108, 142.
- Neff, K. D. (2003). The development and validation of a scale to measure self-compassion. *Self and Identity, 2*, 223–250. doi:[10.1080/15298860309027](https://doi.org/10.1080/15298860309027).
- Nhat Hahn, T. (1991). *Old path white clouds: Walking in the footsteps of the Buddha*. Berkeley, CA: Parallax Press.
- Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crowne Social Desirability Scale. *Journal of Clinical Psychology, 38*, 119–125. doi :[10.1002/1097-4679\(198201\)38:1<119::AID-JCLP2270380118>3.0.CO;2-I](https://doi.org/10.1002/1097-4679(198201)38:1<119::AID-JCLP2270380118>3.0.CO;2-I)
- Ross, L. D., Amabile, T. M., & Steinmetz, J. T. (1977). Social roles, social control and biases in social-perception processes. *Journal of Personality and Social Psychology, 35*, 485–494. doi:[10.1037/0022-3514.35.7.485](https://doi.org/10.1037/0022-3514.35.7.485).
- Shapiro, S., Astin, J., Bishop, S., & Cordova, M. (2005). Mindfulness-based stress reduction for health care professionals: Results from a randomized trial. *International Journal of Stress Management, 12*(2), 164–176. doi:[10.1037/1072-5245.12.2.164](https://doi.org/10.1037/1072-5245.12.2.164).
- Shapiro, S. L., Brown, K. W., & Biegel, G. M. (2007). Teaching self-care to caregivers: Effects of mindfulness-based stress reduction on the mental health of therapists in training. *Training and Education in Professional Psychology, 1*, 105–115. doi:[10.1037/1931-3918.1.2.105](https://doi.org/10.1037/1931-3918.1.2.105).
- Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology, 68*, 615–623. doi:[10.1037/0022-006X.68.4.615](https://doi.org/10.1037/0022-006X.68.4.615).
- Tedeschi, R. G., & Calhoun, L. G. (1996). The posttraumatic growth inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*, 455–471.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect. *Journal of Personality and Social Psychology, 54*, 1063–1070. doi:[10.1037/0022-3514.54.6.1063](https://doi.org/10.1037/0022-3514.54.6.1063).