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Mindfulness skills and interpersonal behaviour

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Abstract

We discuss the multidimensional nature of mindfulness and its relation to interpersonal feelings and performance. We examined the factor structure and internal reliability of a self-report measure of mindfulness, the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004), in Dutch speaking Psychology students ($n = 113$) and parents ($n = 246$). We replicated the four factors proposed by Baer et al. (2004): Observe, Describe, Act With Awareness and Accept Without Judgement. The Dutch KIMS and all elements of mindfulness appeared invariant across samples. All elements of mindfulness were positively associated with expressing oneself in various social situations. A greater tendency for mindful observation was associated with more engagement in empathy. Mindful description, acting with awareness, and non-judgemental acceptance were associated with better identification and description of feelings, more body satisfaction, less social anxiety, and less distress contagion.

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Keywords: Awareness; Mindfulness; Empathy; Social anxiety; Interpersonal behaviour

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1. Introduction

Mindfulness has been defined as a state of mind in which one focuses on experience in the present moment in a non-judgemental way (Kabat-Zinn, 1994; Marlatt & Kristeller, 1999). Based on their experience with mindfulness exercises, (Dimidjian & Linehan, 2003; Linehan, 1993) have discriminated four mindfulness skills that can be taught or practiced: Mindful *observation* is the careful attending to internal and external phenomena (e.g., thoughts, emotions, sounds, smells, or proprioceptive sensations). To *act* with awareness is to fully engage in a current activity with undivided attention. To *accept* without judgement is to be non-evaluative about ones experiences in the present moment. Mindful *description* or experiential expression is the immediate, non-judgemental labelling of observations, without conceptual analysis.

Although most mindfulness measures are one-dimensional self-reports, an exploratory factor analysis of their items supports multifaceted conceptions of mindfulness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). One of the earliest measures of mindfulness was the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), which measures the extent to which one acts with awareness in daily life. Baer et al. (2004) have developed a multidimensional self-report questionnaire in line with the theory of Dimidjian and Linehan (2003): the Kentucky Inventory of Mindfulness Skills (KIMS). Factor analyses revealed a four-factor solution reflecting the four mindfulness skills that the scales were designed to measure (Baer et al., 2004): Observe (OBS), Describe (DES), Act With Awareness (ACT), and Accept Without Judgement (ACC).

1.1. Interpersonal behaviour

Mindfulness has always been associated with interpersonal development, both in traditional Bhuddism (Wallace, 2001) and in Western therapies (Hayes, Strosahl, & Wilson, 1999; Linehan, 1993). Mindful individuals are supposed to be more capable of installing and maintaining satisfying relationships (Follette, Palm, & Pearson, 2006; Germer, Siegel, & Fulton, 2005). On the other hand, particular forms of interaction may support or inhibit mindful awareness (Burgoon, Berger, & Waldron, 2000; Claxton, 2005). We offer a brief review of research findings that relate mindfulness to interpersonal behaviour, focusing on three themes: interpersonal reactivity, social anxiety and performance, and body satisfaction. Researchers of mindfulness and interpersonal behaviour have consistently employed the MAAS, which has been shown to measure the same construct as the ACT subscale (Baer et al., 2006). Using the KIMS, we were able to: (1) assess previous findings on the association of a tendency for mindful action with variables of interpersonal behaviour, and (2) extend these findings to other elements of mindfulness.

1.1.1. Interpersonal reactivity

Increased levels of engagement in empathic identification (Shapiro, Schwartz, & Bonner, 1998) and empathic ability (Lesh, 1970) have been observed in students after meditation training. However, Galantino, Baime, Maguire, Szaparay, & Farrar (2005) failed to observe effects of a mindfulness-based stress management course on the interpersonal reactivity of health-care professionals. Davis (1980) has conceptualized sensitivity to others' experiences in the Interpersonal Reactivity Index (IRI), a scale with two higher order dimensions: Empathy or the emotional and cognitive understanding of others, and Personal Distress or feelings of discomfort when con-

fronted with another's negative experiences (Pulos, Elison, & Lennon, 2004). Distress contagion is sometimes explained as a lack of emotion regulation (Hatcher et al., 1994), a skill that is presumably supported by mindful awareness (e.g., Beitel, Ferrer, & Cecero, 2005). Beitel et al. (2005) have observed associations between the MAAS and subscales of the IRI. Students' mindfulness was positively associated with factors of Empathy, but negatively with Personal Distress. In the present study, we have tried to replicate the findings of Beitel et al. (2005). We expected the same pattern of associations for all elements of mindfulness because a more mindful mode of attending should lead to richer and less biased observations of others' behaviour. Also, accurate observations of the self are required for the accurate understanding of others (Decety & Jackson, 2004).

1.1.2. Social anxiety and performance

Baer et al. (2004) observed that students' KIMS scores were associated positively with a measure of emotion regulation. Indeed, mindfulness teaches one to observe rather than to react to distressing thoughts and feelings. Conversely, Martin (1997) has suggested that anxiety hinders a mindful state of awareness. Mindfulness is applied in the treatment of various anxiety disorders (e.g., Germer, 2005; Orsillo, Roemer, Lerner, & Tull, 2004). Block and Wulfert (2000) demonstrated that mindfulness training can increase performance in social situations and reduce social anxiety. Brown and Ryan (2003) found an inverse relationship between peoples' scores on the MAAS and scores on a measure for social anxiety. Interestingly, the ACT subscale of the KIMS – the equivalent of the MAAS – was the only subscale that was not associated with emotion regulation in the study of Baer et al. (2004). In the present study we investigated whether we could replicate the finding of Brown and Ryan (2003) with the ACT scale, and extend it to all elements of mindfulness.

To assess social anxiety, we used the short form of the Scale for Interpersonal Behaviour (s-SIB; Arrindell, de Groot, & Walburg, 1984; Arrindell, Sanavio, & Sica, 2002), which not only measures the level of distress in various social situations, but also the reported frequency of expressing oneself in these situations. In line with the observations of Block and Wulfert (2000), we expected that each mindfulness skill would be associated with higher frequencies of expression. Additionally, the quality of communication may be higher in more mindful individuals. It has been demonstrated that persons who struggle with the accurate perception and expression of emotional cues have more interpersonal problems (Spitzer, Siebel-Jürges, Barnow, Grabe, & Freyberger, 2005). Mindful description is conceptually closely related to the identification and communication of one's feelings (Baer et al., 2004), and as such it is the skill of mindfulness that is most closely related to overt interpersonal behaviour. We have tried to replicate the finding of Baer et al. (2004), who observed more difficulties in identifying and describing feelings in those students who observed or described less mindfully, or who were more judgemental about their experiences.

1.1.3. Self esteem and body satisfaction

Self esteem is a positive predictor of social acceptance, and thus regulates affect and behaviour in social interactions (Donnelan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Leary, Tambor, Terdal, & Downs, 1995). Mindfulness can contribute to self esteem through promoting authenticity instead of social comparison and acceptance instead of evaluation (Carson & Langer, 2006). Additionally, through non-judgemental awareness of sensorial stimuli and motor activities, mindfulness can contribute to body satisfaction. Satisfaction with body parts, zones and functions is

considered an important element or correlate of global self esteem (Baardman & de Jong, 1984; Maiano et al., 2006). Higher levels of body satisfaction have been reported for participants in awareness-oriented exercises (e.g., Clance, Mitchell, & Engelman, 1980; Laumer, Bauer, Fichter, & Milz, 1997). Brown and Ryan (2003) observed high associations between the MAAS and measures of self esteem. We expected to find a positive association of body satisfaction with mindful observation and action, as well as non-judgemental acceptance.

2. Material and method

2.1. Material

The *Kentucky Inventory of Mindfulness Skills* consists of 39 items and four scales, corresponding to the four skills of mindfulness described in the introduction (OBS, DES, ACT, ACC). Medium to strong positive associations with the KIMS have been demonstrated for various measures of mindfulness, as well as for variables like meditation experience, emotional intelligence and self-compassion. Negative associations with the KIMS have been demonstrated for clinical variables like experiential avoidance or difficulties in emotion regulation (Baer et al., 2004, 2006).

The KIMS was translated into Dutch by an experienced mindfulness trainer and cognitive therapist (D.D.) and a graduate psychology student with meditation experience (L.S.). Both are native speakers of Dutch and living in Flanders, the Dutch speaking part of Belgium. An independent Flemish, native Dutch linguist – specialized in Germanic languages but not familiar with mindfulness – translated this version back into English. Permission for translation was obtained from Dr. Baer, who also approved the back translation. The Dutch KIMS is available from the first author. As differentiation between elements of mindfulness is central to our investigation, we have tested whether the four-factor solution could be replicated for a Dutch version of the KIMS. Additionally, we have assessed to what extent our version measured comparable constructs in both samples.

The *Interpersonal Reactivity Index* (IRI; Davis, 1980) assesses sensitivity to the experiences of others. It consists of 28 self-report items, supposedly representing a four-dimensional structure. The items of subscales Perspective Taking, Empathic Concern and Fantasy can be pooled as a measure of engagement in empathy (EMP; Pulos et al., 2004). Personal Distress (PD) measures a tendency for experiencing distress when witnessing the distress of others.

The short form of the *Scale for Interpersonal Behaviour* (s-SIB; Arrindell et al., 2002) measures social assertiveness through self-report. The 25 items in the questionnaire represent four domains: Negative Assertion (e.g. defence of rights and interests), Positive Assertion (e.g. giving and receiving compliments), dealing with Personal Limitations (e.g. admitting ignorance and requesting help), and Initiating Assertiveness (e.g. introducing oneself or expressing one's own opinion). The s-SIB measures two aspects for every domain: Performance (PER) or the frequency with which participants engage in such situations, and Distress (DIS) or the level of tension or anxiety experienced in these situations. The items in each domain show high internal consistency for both measures, and the factor structure of the original test was confirmed for the short form. DIS correlates highly ($r > .50$) with other measures of social anxiety (Arrindell et al., 1984, 2002).

The *Toronto Alexithymia Scale* (TAS-20; Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994) is considered the standard self-report instrument for studying problems in identifying and expressing feelings (Kooiman, Spinhoven, & Trijsburg, 2002). The scale has three dimensions: Difficulties in Identifying Feelings, often joined with Difficulties in Describing Feelings, and Externally Oriented Thinking. The latter subscale was repetitiously observed to be unreliable and its face validity is questioned (Kooiman et al., 2002). We have therefore omitted this subscale from the analyses.

The *Body Cathexis Scale* (BCS; Secord & Jourard, 1953) measures self-reported satisfaction with body parts, – zones and – functions. Relevance of particular body elements for self esteem varies across gender and region (Maiano et al., 2006). Baardman and de Jong (1984) have developed a short version of this scale, consisting of 13 items that are most highly associated with self esteem in men and women in The Netherlands.

2.2. *Participants and procedure*

For this study we have selected all cases that completed the KIMS, from two samples that were recruited for research on awareness and communication processes (Dekeyser, Elliott, & Leijssen, submitted for publication). The Student Sample included 113 graduates (102 women) enrolled in psychology courses at the University of Leuven (Belgium), on average 21.99 years old ($SD = 2.19$; range 20–37). All participants had completed at least 14 years of education and completed a questionnaire anonymously on paper during class. The Parent Sample included 246 parents (229 women) from Belgium and The Netherlands who were invited through online communities for parents to complete the questionnaire online. Their mean age was 30.77 years ($SD = 6.51$; range 20–64), and they averaged 14.59 years of education ($SD = 2.19$; range 12–17).

3. Results

3.1. *Psychometric evaluation of the Dutch KIMS*

3.1.1. *Confirmatory factor analysis*

To evaluate the psychometric qualities of the Dutch KIMS, we only used data from fully completed questionnaires ($n = 333$). To assess the four-factor structure of the original KIMS for the Dutch version, we conducted a confirmatory factor analysis (CFA) using the Lisrel 8.80[®] software (Jöreskog & Sörbom, 2006). We employed maximum likelihood estimation because of its robust performance (Hu, Bentler, & Kano, 1992). We calculated χ^2 , the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990), the Comparative Fit Index (CFI; Bentler, 1990), and the Root Mean Square Residual (RMR). A RMSEA value of .05 indicates a close fit; values at or below .08 represent reasonable errors of approximation in the population (Browne & Cudeck, 1993). CFI values at .90 or higher are interpreted as acceptable, as are RMR values at .10 or lower. Just like Baer et al. (2004, 2006), we constructed four parcels of two to three items for each factor. The averages of these parcels were then used as indicators for each factor. We allowed the four factors to intercorrelate.

Fit indices for the four factor model, as well as a more parsimonious one factor model, in both samples, are presented in Table 1. The four factor model had an acceptable practical fit in both samples, while the one factor model did not fit either sample. Cheung and Rensvold (2002) have observed that differences in RMSEA can be misleading, while CFI differences at $-.01$ or below indicate that the more parsimonious model should not be adopted. Differences in both χ^2 and CFI indicated that the four factor model fitted these samples better.

To explore invariance of the Dutch KIMS across the two samples, we applied multigroup CFA using the four factor model. Model 1, only constrained by configuration, had acceptable practical fit indices (RMSEA = .073, 90% confidence interval = .062–.085; CFI = .955). Four additional models were fitted on the data, with gradually increasing equality constraints (see Table 2). With all factor loadings constrained, except for parcel 14 (items 8, 24), Model 2 fitted the data as well as the original model. Adding additional equality constraints to Model 2, we tested for invariance of the residual variances (Model 3) and parcel intercepts (Model 4). The hypothesis of invariance of residual variances was rejected. To Model 4 we added equality constraints for all factor covariances (Model 5), but we could not reject the hypothesis of construct covariance.

3.1.2. Internal consistency and relations between KIMS scales

Alpha coefficients were at .83 or higher for each of the KIMS scales (see Table 4). All items contributed to subscale consistency, except for items 8, 11 and 27. However, when deleted, these items would increase the scale's total alpha coefficient with only .010, .001 and .003 points, respec-

Table 1
Fit indices for one and four factor KIMS models (samples)

Sample	Factors	χ^2	df	RMSEA	CFI	RMR	$\Delta\chi^2$	Δdf	ΔCFI
Student	1	597.17***	104	.241 (.225–.257) ^a	.596	.098			
	4	124.16*	98	.045 (.000–.070) ^a	.979	.039	473.01***	6	-.383
Parent	1	1133.40*	104	.243 (.232–.254) ^a	.606	.118			
	4	245.96***	98	.084 (.071–.097) ^a	.943	.053	887.44***	6	-.337

^a 90% confidence interval.

* $p < .05$.

*** $p < .001$.

Table 2
Fit indices for KIMS four factor models and for tests of invariance (across samples)

Invariance model	χ^2	df	CFI	$\Delta\chi^2$	Δdf	ΔCFI
Model 1: factor pattern	370.12***	196	.955			
Model 2: Model 1 + factor loadings ^a	390.98***	211	.953	20.86	15	-.002
Model 3: Model 2 + residual variances	427.97***	227	.948	36.99**	16	-.005
Model 4: Model 2 + parcel intercepts	410.52***	223	.951	19.55	12	-.002
Model 5: Model 4 + factor covariances	415.88***	229	.951	5.36	6	-.000

^a Same factor loadings for both groups, except for parcel 14.

** $p < .01$.

*** $p < .001$.

tively. Thus, the Dutch KIMS internal consistency appears to be adequate (Nunnally, 1978). As should be expected, we found significant correlations between all scales (see Table 3). All correlations were positive, except for the correlation between OBS and ACC, a finding previously reported by Baer et al. (2004). The positive association of OBS and ACT was expected but not reported by Baer et al. (2004).

3.2. Relationship with demographic variables and interpersonal behaviour

Cronbach's α coefficients for all measures are presented in Table 4, with means and standard deviations for each sample as well as males and females. With a Bonferroni corrected probability level of .005, ACT was higher in males, $t(357) = 3.36$, $p < .005$. The Student Sample had higher ACT than a comparable sample of psychology undergraduates reported by Baer et al. (2004)

Table 3
Intercorrelations among KIMS scales in combined sample ($n = 333$)

	DES	ACT	ACC
OBS	.36***	.12*	-.11*
DES		.28***	.16**
ACT			.32***

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 4
Means, standard deviations, and Cronbach's α for KIMS scales and measures of interpersonal behaviour, with KIMS scores reported by Baer et al. (2004)

	Mean (SD) ^a					α
	Baer ^b	Student	Parent	Male	Female	
n	215	113	246	28	331	
KIMS-OBS	3.22 (.65)	3.38 (.47)	3.26 (.57)	3.41 (.49)	3.29 (.55)	.83
KIMS-DES	3.53 (.69)	3.51 (.64)	3.46 (.77)	3.58 (.76)	3.47 (.73)	.91
KIMS-ACT	2.92 (.54)	2.92 (.48)	2.92 (.49)	3.21 (.55)	2.90 (.48)	.77
KIMS-ACC	3.29 (.72)	3.54 (.66)	3.53 (.67)	3.66 (.73)	3.53 (.66)	.86
n		101	246	25	322	
IRI-EMP		3.64 (.40)	3.46 (.46)	3.33 (.46)	3.53 (.45)	.81
IRI-PD		2.96 (.62)	2.95 (.65)	2.71 (.67)	2.97 (.63)	.76
BCS		3.62 (.41)	3.50 (.49)	3.73 (.39)	3.52 (.48)	.77
SIB-DIS		2.68 (.59)	2.38 (.66)	2.46 (.44)	2.47 (.67)	.93
n		113	221	26	308	
SIB-PER		3.19 (.38)	3.18 (.53)	3.35 (.44)	3.17 (.49)	.89
n		113	244	28	329	
TAS-DIDF		2.29 (.58)	2.24 (.68)	2.14 (.61)	2.26 (.65)	.86

^a Based on 5-point Likert scales, range 1–5.

^b Data from Sample 2 in Baer et al. (2004).

Table 5

Pearson correlation between KIMS scales and measures of interpersonal behaviour (samples)

	OBS ^a	DES ^a	ACT ^a	ACC ^a	n ^a
IRI-EMP	.33** / .31***	.32** / .05	.14 / .01	-.15 / -.07	101/246
IRI-PD	-.04 / -.10	-.33** / -.34***	-.28** / -.25***	-.37*** / -.40***	101/246
SIB-DIS	-.11 / -.20**	-.31** / -.40***	-.46*** / -.21**	-.38*** / -.25***	101/246
SIB-PER	.25** / .17*	.48*** / .36***	.30** / .21**	.20* / .17*	113/221
TAS-DIDF	.08 / -.19**	-.64*** / -.67***	-.42*** / -.35***	-.45*** / -.48***	113/244
BCS	.08 / .23***	.32** / .18**	.41*** / .21**	.33** / .29***	101/246

^a Student Sample/Parent Sample.* $p < .05$.** $p < .01$.*** $p < .001$.

$t(326) = 3.07, p < .005$; see Table 4. Students had higher IRI-EMP and s-SIB-DIS scores than parents: $t(345) = 3.30, p < .005$; $t(345) = 3.95, p < .001$.

Correlations of KIMS scales and interpersonal variables in each sample are presented in Table 5. The findings were largely equivalent in both samples; correlations that reached significance in only one sample are reported separately. IRI-EMP was associated positively with OBS, while IRI-PD was associated negatively with all KIMS scales except OBS. In the Student Sample, DES was also associated with IRI-EMP. The predicted association of ACT and IRI-EMP was not observed. We found negative associations between s-SIB-DIS and all KIMS scales except OBS. In the Parent Sample, s-SIB-DIS was also negatively associated with OBS. We observed positive associations between all KIMS scales and s-SIB-PER. TAS Difficulties in Identifying and Describing Feelings (TAS-DIDF) was associated negatively with ACT and ACC, and to a high degree with DES. In the Parent Sample, OBS was also associated negatively with TAS-DIDF. BCS was associated positively with every KIMS subscale, except OBS. In the Parent Sample, OBS was also associated positively with BCS. All but one of the correlations between DES and measures of interpersonal behaviour were at the medium level or higher. When controlling for BCS, all of the medium and high associations remained significant, and the pattern of associations did not change consistently across samples.

4. Discussion

4.1. Psychometrics

Our psychometric analysis largely replicated the findings reported by Baer et al. (2004). CFA supported the four-factor structure of the Dutch KIMS in favour of a single factor model. The Dutch KIMS was metrically invariant for our samples. Additionally, we demonstrated that KIMS scores can be compared meaningfully between our samples, and intercorrelations can be calculated across samples. The subscales appeared internally consistent. As should be expected, we found positive correlations between all KIMS scales. The only exception was the negative association between OBS and ACC. Baer et al. (2004) attributed this finding in the original KIMS to a lack of meditation experience in her samples.

4.2. *Interpersonal reactivity*

Apparently, not all elements of mindfulness are related to all elements of interpersonal reactivity. We replicated the negative association of acting with awareness and distress contagion that was reported by [Beitel et al. \(2005\)](#), but not the positive association of this mindfulness skill with a tendency for empathy. Possibly, the link between mindful action and empathy in the study of [Beitel et al. \(2005\)](#) was mediated by mindful observation. These findings challenge the idea that all mindfulness exercises will increase engagement in interpersonal empathy. [Shapiro et al. \(1998\)](#), who observed more engagement in empathy after mindfulness training, had actually included specific exercises in empathy as part of their intervention. Contagion by others' distress is negatively associated with all mindfulness skills, except mindful observation.

4.3. *Interpersonal anxiety and performance*

We have replicated the finding of [Brown and Ryan \(2003\)](#) that mindful action and social anxiety are negatively related. We also found that persons who act more mindful, more often express themselves in various social situations. With the four-factor KIMS we could demonstrate that these associations were consistent across all elements of mindfulness in both samples, except for social anxiety and mindful observation. We replicated the finding by [Baer et al. \(2004\)](#) that difficulties in identifying or describing feelings are reported less by persons who are more mindful labellers or who are less judgemental towards their experiences. We observed the same negative association for acting with awareness, a finding that was expected but not observed by [Baer et al. \(2004\)](#). Mindful observation was only (negatively) related to difficulties in identifying or describing feelings in the parent sample.

4.4. *Body satisfaction*

We consistently found a positive relation between body satisfaction and all elements of mindfulness, except for mindful observation in the Student Sample. This offers support for the hypothesis that mindfulness may contribute to self esteem. However, body satisfaction cannot fully explain the association of mindfulness with other interpersonal variables in this study.

4.5. *Conclusion*

We have replicated the four factor structure of the KIMS found by [Baer et al. \(2004\)](#), in support of a multidimensional view of mindfulness. This measure and its constructs were invariant across two Dutch speaking samples. Studies of mindfulness and interpersonal behaviour have focused on acting with awareness. Using the KIMS, we were able to continue this line of research and extend it to other elements of mindfulness. In both samples, elements of mindfulness were associated with a greater frequency of expressing oneself in various social situations. A greater tendency for mindful observation was consistently associated with more engagement in empathy. Mindful description, acting with awareness, and non-judgemental acceptance were consistently associated with better identification and description of feelings, more body satisfaction, less social anxiety, and less distress contagion. The most prominent pattern of associations was observed for

mindful description, the skill of mindfulness that is conceptually most closely related to overt interpersonal behaviour (Baer et al., 2004).

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