

Are Dimensions of Interoceptive Awareness the Same for Everyone? Serbian Validation of MAIA-2 in Samples with Differing Mind-Body Practice Experience*

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The Multidimensional Assessment of Interoceptive Awareness (MAIA) is a widely used self-report instrument for measuring interoceptive awareness. The improved version, MAIA-2, has not yet been thoroughly validated. To validate the Serbian translation of MAIA-2, we recruited two samples: 214 participants with experience in mind-body practices and 229 university students. Both samples also completed a range of relevant psychological measures. Despite obtaining fewer factors than the original MAIA, our findings support the notion that adaptive and maladaptive aspects of interoceptive awareness should be distinguished. Furthermore, the

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factor structure of interoceptive awareness appears to vary depending on participants' levels of mind-body practice experience. Notably, mind-body practitioners scored higher across all dimensions compared to students, and greater experience with mind-body practices was associated with enhanced interoceptive awareness. Overall, MAIA-2 demonstrated acceptable reliability and meaningful associations with other psychological constructs, supporting its utility as a measure of interoceptive awareness.

Keywords: interoception, interoceptive sensibility, interoceptive awareness, MAIA, Multidimensional Assessment of Interoceptive Awareness

Highlights

- MAIA-2 was evaluated in two samples differing in mind-body experience.
- The originally proposed eight-factor structure was not supported in either of the samples.
- Mind-body experienced sample exhibited a more differentiated interoceptive awareness.
- Participants with mind-body experience showed higher level of interoceptive awareness.
- MAIA-2 showed acceptable reliability and meaningful associations with other measures.

The term interoception broadly refers to “...the processing of internal bodily stimuli by the nervous system” (Khalsa et al., 2018, p. 501). During the past decade numerous efforts have been made to delineate distinct aspects of interoception, especially those that are accessible to conscious awareness (e.g., Garfinkel et al., 2015; Khalsa et al., 2018; Murphy et al., 2019). Mehling et al. (2012, p. 2) define *interoceptive awareness* as “...a conscious perception of sensations from inside the body that create the sense of the physiological condition of the body, including interpretational and organizing aspects of perception”. The term *interoceptive sensibility* is also sometimes used interchangeably with *interoceptive awareness* (Mehling et al. 2016, 2018), as we will do in this paper.

The Multidimensional Assessment of Interoceptive Awareness

The Multidimensional Assessment of Interoceptive Awareness (MAIA; Mehling et al., 2018; Mehling et al., 2012) is one of the most frequently referenced self-report instruments in the interoception literature (Desmedt et al., 2022). It has been widely translated and validated (see MAIA internet page “*Multidimensional assessment of interoceptive awareness*,” n.d.). The questionnaire was developed to help differentiate between anxiety-driven and mindful interoceptive styles, and it assesses eight distinct aspects of interoception awareness: 1) *Noticing* – awareness of body sensations; 2) *Not-Distracting* – the tendency not to ignore or distract oneself from sensations of pain or discomfort; 3) *Not-Worrying* – the tendency not to worry or become emotionally distressed

with sensations of pain or discomfort; 4) *Attention Regulation* – ability to sustain and control attention to body sensations; 5) *Emotional Awareness* – awareness of the connection between body sensations and emotional states; 6) *Self-Regulation* – ability to regulate distress by attention to body sensations; 7) *Body Listening* – active listening to the body for insight; and 8) *Trusting* – experience of one's body as safe and trustworthy. In line with the idea that mind-body practices (e.g., meditation, mindfulness, yoga, Tai Chi, massage, body-oriented therapy) can impact interoceptive awareness (Mehling et al., 2012; Mehling et al., 2011), the authors collaborated with practitioners during scale construction and several studies have reported a positive association between engagement in mind-body practices and MAIA scores (e.g., Bornemann et al., 2015; Ferentzi et al., 2020; Lin et al., 2017; Mehling et al., 2012).

Since reliabilities of the Not-Distracting, and Not-Worrying scales were unsatisfactory ($.60 < \alpha < .70$) in both the original study (Mehling et al., 2012), as well as in multiple later samples (see Ferentzi et al., 2020; Mehling, 2016; Todd et al., 2020), the authors sought to improve them by adding items. The revised questionnaire, the Multidimensional Assessment of Interoceptive Awareness, Version 2 (MAIA-2) showed moderately improved reliabilities of .74 for Not-Distracting (three added items) and .67 for Not-Worrying (two added items) (Mehling et al., 2018).

Another issue with the original MAIA, which was not explicitly addressed in the revision, concerned the relations between dimensions. Specifically, Not-Distracting and Not-Worrying were only weakly related to the rest of the scales, which were strongly intercorrelated. Ferentzi et al. (2020) highlighted these intercorrelations as problematic in terms of construct validity and further suggested that, with the exception of Not-Worrying (which mainly assesses neuroticism) and Not-Distracting (which does not seem to capture a coherent construct), all other MAIA scales assess interoceptive awareness in a manner that limits more nuanced differentiation. Similarly, in their summary of studies examining the factorial structure of MAIA (most of which were conducted using the first version) Todd et al. (2020) found that, although the original or modified eight-factor models were retained in many of the studies¹, models with fewer (three to seven) factors were also frequently identified.

Thus, our study sought to provide a significant contribution to determining whether MAIA-2 has indeed addressed the limitations of the original version, both in terms of reliability and structural validity.

Current Study

Our main goal was to validate the Serbian version of MAIA-2 on a sample of individuals with experience in mind-body practices by examining its: 1) factorial structure and reliability, 2) associations with mind-body experience and, 3) associations with relevant psychological constructs. Since mind-body

1 It should also be noted that Todd et al. (2020) identified several problems in various factorial studies of MAIA, such as using eigenvalue > 1.0 as the factor retention criterion or retaining models with problematic indices of fit.

approaches played an important role in the original questionnaire development process, we chose to assess MAIA-2 to a sample with mind-body experience. Mind-body practices, in general, focus on mindful body awareness through various techniques, such as breathing exercises and attunement with body sensations, while also incorporating thoughts and emotions (Jokić et al., 2023; Jokić et al., 2019; Mehling et al., 2012).

According to the original model, we should expect an eight-factor solution (H1); however, identifying fewer factors would also not be unexpected (e.g., Ferentzi et al., 2020; Fujino, 2019; Machorrinho et al., 2019; Özpınar et al., 2021; Purić & Jokić, 2019; Salvador et al., 2020; Shoji et al., 2018; Todd et al., 2020). We planned to assess the reliability of MAIA-2 dimensions using Cronbach's alpha coefficients.

Drawing on previous studies, we expected that mind-body experience would predict scores on at least some MAIA-2 scales, with small effect sizes (less than 25% of explained variance) (H2, Ferentzi et al., 2020). We further hypothesised that at least some MAIA-2 scales would correlate positively (up to .30) with mindfulness (H3, e.g., Ferentzi et al., 2020; Jokić & Purić, 2020; Todd et al., 2020), most would show positive correlations (in the range of $.10 \leq r \leq .40$) with well-being (H4, Hanley et al. 2017; Jokić & Purić, 2020), negative correlations (in the $.20 - .50$ range) with measures of anxiety (H5, Mehling et al., 2012), and mostly modest correlations (up to .30) with personality traits (H6, Da Costa Silva et al., 2022; Ferentzi et al., 2020; Pearson & Pfeifer, 2020). We decided to supplement the "personality space" by including a recently conceptualised broad personality trait of psychosis-proneness, i.e., Disintegration (Knežević et al., 2017), anticipating similarly low correlations (Barbato et al., 2021, but see also Torregrossa et al., 2022).

On an exploratory level, we wanted to see whether the same pattern of results commonly observed for anxiety would be replicated for depression and stress (Jokić & Purić, 2021). We also aimed to examine the relation between interoceptive sensibility and use of specific emotion regulation strategies, as higher interoceptive awareness has previously been associated with fewer difficulties in emotion regulation (e.g., Mehling et al., 2012; Shoji et al., 2018; Willem et al., 2022).

Finally, to gain a better understanding of potential specificities of mind-body practitioners, we aimed to compare them with a student sample. We again tested the factorial validity of MAIA-2, its reliability (Cronbach's alpha alongside test-retest reliability), as well as its relations with well-being and personality traits, expecting the same pattern of results as observed in the practitioner sample. We also expected participants with greater experience in mind-body practices to show higher interoceptive awareness (H7², Bornemann et al., 2015; Lin et al., 2017; Mehling et al., 2012).

2 This hypothesis was not preregistered.

Method

Procedure and Participants

Mind-Body Sample

Participants over the age of 18 and with past or present experience in mind-body training were eligible to participate in the study. We used a snowball sampling method to recruit participants, including 1) posting Facebook advertisements and posts on groups/pages dedicated to mind-body practices; 2) inviting mind-body clubs to share the study link with their members; 3) distributing the study via the listserv of the Serbian Association for Body Psychotherapy; and 4) contacting personal acquaintances with mind-body experience. There was no compensation for participation, and the data was collected online, from April to December 2021. The study was approved by the IRB of the Department of Psychology, Faculty of Philosophy, University of Belgrade (protocols #2021-20 and #2021-63). All participants provided informed consent prior to taking part in the study.

In total, 220 individuals completed the questionnaires. Participants with no mind-body experience ($n = 5$) and one participant with an implausible age-years of experience combination were removed from the study. Thus, the final sample included $n = 214$ participants (79% women) with a mean age of 41 ($SD = 12.3$) and median of 16 years of education ($M = 16.1$, $SD = 2.9$).

A wide range was observed for years of mind-body experience (from less than 1 to 48), with participants reporting a median of 9 and mean of 10.3 ($SD = 9.1$) years of experience. The majority of the sample (71.96%, $n = 154$) were actively engaged in mind-body training at the time of the testing, with approximately three training sessions weekly ($Mdn = 3.0$, $M = 3.82$, $SD = 3.11$). Participants mostly had experience with mind-body practices such as yoga, meditation, martial arts, and Tai Chi (see Supplement A in Online Supplementary Material for more details about participants' experience). Body psychotherapy was also recognised as a mind-body practice as it emphasises a direct work with the body recognising its inseparable relationship with cognitive, emotional, perceptual, and physical aspects of self-experience (Röhrich, 2009). However, unlike other body-mind practices, it incorporates common elements of psychotherapy (Rosendahl et al., 2021).

Student Sample

Psychology students from the University Belgrade participated in the study in exchange for course credit. Data were collected online from December 2020 and December 2021. The study was exempt from ethical review as a low risk study and the procedures were conducted in accordance with the Declaration of Helsinki, with all participants providing informed consent.

A total of 229 students (83% women, mean age 20.2, $SD = 2.2$) completed the study. A subsample of participants ($n = 71$, female 87.3%, $M_{age} = 20.6$, $SD = 3.2$) completed the MAIA-2 a second time approximately three months later. The mean interval between the two time points was 86 days ($SD = 8.7$, range = 70-107 days).

Power Analysis

We determined the planned sample size a priori. Since MAIA-2 comprises 37 items, a sample of $N = 185$ participants yields a 5:1 participant-to-item ratio, which is recommended for conducting exploratory factor analysis (Norris & Lecavalier, 2010). To detect low correlations ($r = .20$, two-tailed), with a power of 80% and $p = .05$, a sample of $n = 193$ participants is required (G*Power; Faul et al., 2009). Therefore, we set the minimum required sample size to be 200, for both the practitioner and the student sample. Both samples exceeded this threshold.

Instruments

MAIA-2 (Mehling et al., 2018; Serbian version, Jokić et al., 2021) assesses interoceptive awareness across eight subscales: Noticing (4 items), Not-Distracting (6 items), Not-Worrying (5 items), Attention Regulation (7 items), Emotional Awareness (5 items), Self-Regulation (4 items), Body Listening (3 items), and Trusting (3 items). We used the official Serbian version of MAIA-2 (<https://osher.ucsf.edu/research/maia>), which was translated using a systematic forward-backward procedure (Jokić et al., 2021).

The Mindful Attention Awareness Scale (MAAS, Brown & Ryan, 2003; Serbian version, Jokić & Purić, 2020) assesses the tendency to adopt a mindful mindset using 15 items.

The Depression Anxiety Stress Scales-21 (DASS-21, Lovibond & Lovibond, 1995; Serbian version, Jovanović et al., 2014) is a 21-item short form of the DASS questionnaire, which assesses symptoms of depression, anxiety, and stress.

The Emotion Regulation Questionnaire (ERQ, Gross & John, 2003; Serbian version, Popov et al., 2016) consists of the two subscales: Reappraisal (6 items) and the Suppression (4 items).

The Subjective Happiness Scale (SHS, Lyubomirsky & Lepper, 1999; Serbian version, Jovanović, 2014) includes four items.

The Satisfaction With Life Scale (SWLS, Diener et al., 1985; Serbian version, Vasić et al., 2011) contains five items.

The HEXACO Personality Inventory (Ashton & Lee, 2009; Lee & Ashton, 2018; Serbian version, Mededović et al., 2019) assesses six broad personality dimensions: Honesty-Humility (H), Emotionality (E), eXtraversion (X), Agreeableness (A), Conscientiousness (C), and Openness to Experience (O). We used the 60-item version (Ashton & Lee, 2009) for the mind-body practitioner sample and the 100-item version (Lee & Ashton, 2018) for the student sample.

DELTA9 (Knežević et al., 2017) assesses the broad personality trait of disintegration. The student sample completed the full 110-item version, while the mind-body practitioner sample completed the short 20-item version.

Responses to MAIA-2 were given on a 0-5 Likert type scale, to DASS-21 on a 0-3 scale, to MASS on a 1-6 scale, to ERQ, SHS and SWLS on a 1-7 scale, and for both HEXACO versions and DELTA9 on a 1-5 Likert type scale.

Procedure

Both samples filled out MAIA-2, SHS, HEXACO, and DELTA questionnaires and provided information on their age and gender. The mind-body sample also completed MAAS, DASS-21, SWLS, and ERQ and responded to a set of questions regarding their mind-body experience and socio-demographic background. The questionnaires were presented in a fixed sequence, with MAIA-2 administered in the first place, and all items were mandatory.

Data Analysis

We used IBM SPSS (version 23) and R (version 4.3.1; R Core Team, 2023) for data analysis. For a full list of R packages used see Supplement B in the Online Supplementary Material. To facilitate comparability across scales, all scores were calculated by averaging the corresponding items.

Open Science

Both the hypotheses and the analytic strategy of the main study were preregistered (<https://osf.io/zeq94>). We did not preregister the collection of an additional student sample; however the same materials and analytic procedures were applied to test the corresponding hypotheses. A separate file on the OSF project page (<https://osf.io/wjd6s>) lists all minor deviations from the preregistration. The Online Supplementary Material (<https://osf.io/qbmhj>) contains additional information regarding participants' mind-body experience, a full list of R packages used in the study, descriptive statistics for validation variables, as well as a more detailed presentation of the results from the factorial and correlational analyses.

Results

Factorial Structure of MAIA-2

To explore the factorial structure of MAIA-2, we conducted an exploratory factor analysis (EFA), using principal axis factoring with Promax rotation, separately for the mind-body and the student sample. To determine the number of factors, we used parallel analysis, Velicer's MAP criterion and the scree plot. Although several items in the practitioner sample exhibited high skewness and/or kurtosis ($> |2|$), the assumptions for EFA were met – Bartlett's test was significant ($p < .001$ for both samples) and KMO values were high (.88 for the mind-body sample and .82 for the student sample).

For the mind-body practitioner sample, parallel analysis suggested that nine factors should be retained, MAP suggested six, and the scree plot indicated three or six factors (see supplementary Figures C1-C2). Thus, we examined the three-, six-, and nine-factor solutions, as well as the originally proposed eight-factor model (see supplementary Tables C1-C8). The six-factor solution was superior in terms of interpretability and identified the following factors: 1) Attention regulation, 2) Listening and trusting: comprising all Body Listening, all Trusting and two Self-Regulation items, 3) Noticing, 4) Not-Distracting, 5) Emotional Awareness: all Emotional Awareness and two Self-Regulation items, and 6) Not-Worrying. Since all factors (except for Not-Distracting and Not-Worrying) were mutually positively correlated (all but one correlation $\geq .50$; Table C9, Supplement C), we decided to perform a second-order EFA. The higher-order, general MAIA factor (gMAIA) showed strong loadings of all first-order factors, except for Not-Distracting and Not-Worrying (see figures C3-C4 and Table C10 in Supplement C).

For the student sample, parallel analysis suggested an 11-factor solution, MAP suggested four or six factors, and the largest drop on the scree plot was occurred after the third factor (see Figures D1-D2 in Supplement D). We explored all of the suggested solutions, as well as the original 8-factor solution (see Tables D1-D10 in Supplement D). We chose to retain the three-factor solution, as it was the best in terms of both Thurstone's simple structure and interpretability. Not-Worrying and Not-Distracting formed separate factors, while all remaining MAIA items loaded on a general interoceptive awareness factor, gMAIA. The three factors were essentially orthogonal (Table D11, Supplement D).

Subsequent analyses were performed on factor scores calculated by averaging the items with primary loadings on each factor. For gMAIA, we averaged all items except those from the Not-Worrying and Not-Distracting scales.

Descriptive Statistics and Psychometric Properties of Instruments

With the exception of Not-Distracting, which showed mean values below the scale midpoint, participants in both samples generally tended to agree with MAIA-2 items (Tables 1 and 2). Cronbach's alpha coefficients indicated satisfactory to good reliability across both samples. Test-retest reliability was overall acceptable, with Pearson's $r = .72$ for Not-Worrying, $r = .69$ for gMAIA, and $r = .50$ for Not-Distracting ($p < .001$ for all), considering the type of reliability coefficient used (Matheson, 2019).

Internal consistencies of other constructs were also good (see Tables E1-E2 in Supplement E). As most distributions only slightly deviated from normality, we did not perform any transformations but instead used non-parametric analytic procedures.

Table 1

Descriptive statistics and psychometric properties of MAIA-2 for the mind-body sample (N = 214)

Scale	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Sk</i>	<i>Ku</i>	<i>S-W</i>	α
gMAIA	4.00	0.69	1.54	5.00	-0.75	0.22	0.954***	.94
Attention regulation	3.93	0.85	0.71	5.00	-0.81	0.37	0.933***	.90
Listening and trusting	3.76	0.92	0.75	5.00	-0.80	0.16	0.941***	.90
Noticing	4.23	0.77	0.50	5.00	-1.62	3.87	0.847***	.76
Emotional Awareness	4.20	0.75	0.00	5.00	-1.65	4.83	0.863***	.84
Not-Distracting	2.42	1.17	0.00	5.00	0.01	-0.65	0.986*	.87
Not-Worrying	2.97	1.06	0.00	5.00	-0.22	-0.54	0.982**	.78

Notes. gMAIA = general MAIA factor; S-W = Shapiro-Wilk Test for Normality; α = Cronbach's alpha.

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

Table 2

Descriptive statistics and psychometric properties of MAIA-2 for the student sample

Scale	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Sk</i>	<i>Ku</i>	<i>S-W</i>	α
MAIA-2								
gMAIA ^a	3.17	0.72	0.77	4.69	-0.38	0.11	0.988	.91
Not-Worrying ^a	2.61	1.05	0.00	5.00	-0.15	-0.55	0.986*	.85
Not-Distracting ^a	1.95	0.90	0.00	5.00	0.34	0.08	0.986*	.81
MAIA-2 T2								
gMAIA ^b T2	3.16	0.81	1.31	4.73	0.00	-0.58	0.985	.93
Not-Worrying ^b T2	2.61	1.14	0.00	5.00	-0.25	-0.52	0.979	.87
Not-Distracting ^b T2	1.94	0.87	0.50	5.00	0.89	1.34	0.947**	.76

Notes. gMAIA = general MAIA factor; T2 = retest sample; S-W = Shapiro-Wilk Test for Normality; α = Cronbach's alpha.

^a $n = 229$. ^b $n = 71$.

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

Relation of Interoceptive Awareness With Mind-Body Experience

We examined the association between mind-body experience and interoceptive awareness by both comparing the scores between the practitioner and student samples, and testing the predictive power of years of experience and number of weekly sessions on practitioners' MAIA-2 scores.

A two-tailed Welch's *t*-test (Delacre et al., 2021) indicated significantly higher scores for mind-body experienced individuals compared to students on all MAIA-2 dimensions (H7): gMAIA ($t(440.662) = 12.34, p < .001$, Cohen's $d^* = 1.17^3$, 95% CI [0.97, 1.37]), Not-Worrying ($t(438.82) = 3.56, p < .001$, Cohen's $d^* = 0.34$, 95% CI [0.15, 0.53]), and Not-Distracting ($t(400.38) = 4.68, p < .001$, Cohen's $d^* = 0.45$, 95% CI [0.26, 0.64]).

As expected, both years of experience with mind-body practices, and, more notably, the number of weekly sessions were positively related to the levels of interoceptive awareness (H2, Table 3)⁴. Interestingly, years of mind-body experience contributed only to the prediction of Noticing and Not-Distracting, whereas the number of weekly sessions was significantly associated with all MAIA-2 dimensions except Noticing and Not-Worrying.

Table 3
Results of a robust regression predicting MAIA-2 scores based on mind-body experience

Model	R^2	R^2_{adj}	p	Predictors			
				Years of experience		Weekly sessions	
				r	β	r	β
gMAIA	.13	.12	<.001	.07	0.10	.38***	0.28**
Attention regulation	.13	.12	<.001	.21*	0.12	.38***	0.30**
Listening and trusting	.12	.10	.004	.09	-0.02	.35**	0.33**
Noticing	.08	.07	.007	.03	0.17**	.18*	0.11
Emotional Awareness	.06	.04	.012	-.14	-0.00	.24**	0.17*
Not-Distracting	.12	.10	<.001	-.16	-0.27***	.23**	0.32***
Not-Worrying	.03	.02	.100	.07	0.04	.19*	0.16

Notes. gMAIA = general MAIA factor; r = Pearson correlation; p = p value of the difference between a tested model and an intercept only model.

$N = 130$.

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

Relations With Relevant Psychological Variables

In line with our hypotheses, we found that among mind-body experienced individuals, higher interoceptive awareness was associated with more frequent

- 3 Since we performed Welch's *t*-test, to assess the magnitude of differences between groups, instead of classical Cohen's *d*, we used an effect size estimator based on the sample mean difference divided by the square root of the non pooled average of both variance estimates, as recommended by Delacre et al., 2021.
- 4 Body psychotherapists were excluded from this analysis to avoid the confounding effect of psychotherapy sessions. This decision was made due to the potential variability in the implementation and the extent of mind-body techniques employed by certain body therapists during sessions with their clients.

mindfulness states (Spearman's correlations .33 – .47, H3), greater well-being (.19 – .51, H4), lower anxiety (up to – .40, H5), as well as lower depression (up to – .37) and stress (up to – .45) levels (all correlations are in Table F1 in Supplement F). A positive correlation with well-being was also found in the student sample (up to .35, Table F2 in Supplement F). Most of these correlations were in the expected range, although some associations with mindfulness and well-being exceeded higher than .30 and .40, respectively. Besides, higher interoceptive awareness was related to a frequent use of the reappraisal (up to .45), and a less frequent use of the suppression emotion regulation strategy. Not-Distracting, in particular, was strongly associated with lower emotion suppression (– .45).

With few exceptions, interoceptive awareness was either unrelated or only moderately related to personality traits (H6), in both mind-body practitioners (with only three significant correlations $\geq .40$ and the student sample (with only one $\geq .40$ value; Table F3 and F2 in Supplement F). The strongest (negative) correlation in both samples was observed between Not-Worrying and Emotionality (– .50 and – .40 for the practitioner and student samples, respectively).

Discussion

The construct of interoceptive awareness has garnered substantial research attention over the years; however, its assessment remains a significant challenge. In the present study, through our validation of the MAIA-2, we addressed the issue of its dimensionality, and examined the role of experience with mind-body practices in shaping interoceptive sensibility.

How Many Interoceptive Dimensions Does MAIA-2 Assess?

One of the major controversies regarding multidimensional assessment of interoceptive awareness concerns its actual factor structure. By comparing the factor structure of MAIA-2 in a sample of practitioners with that of students, we were in a unique position to investigate whether its dimensionality varies depending on mind-body experience.

We found no support for the originally proposed, and occasionally replicated, eight-factor solution (e.g., Bornemann et al., 2015; Lin et al., 2017; Valenzuela-Moguillansky & Reyes-Reyes, 2015) in either sample. More importantly, the number of retained factors differed for the two subsamples. In the practitioner sample, we obtained six first-order factors that either aligned with the original MAIA-2 scales or represented combinations of them (see also Shoji et al., 2018). However, a second-order general interoceptive awareness factor was emerged as well, encompassing all MAIA-2 scales except Not-Distracting and Not-Worrying – similar to the best-fitting model identified by Da Costa Silva et al. (2022). The same general interoceptive awareness factor, along with distinct Not-Distracting and Not-Worrying factors, also emerged in the three-factor solution obtained from the student sample (see also Desmedt et al., 2022). In other words, as suggested by Ferentzi et al. (2020), regardless of the

mind-body experience level, resistance to distraction and worry represent latent dimensions distinct from one another and from general sensitivity to internal bodily states. These three core factors appear to be robust, but individuals with mind-body experience demonstrate a more differentiated interoceptive profile compared to those with little or no such experience.

MAIA-2 Reliability

Satisfactory to good Cronbach's alpha values were observed for all retained MAIA-2 dimensions in both samples, implying that the authors were successful in improving the psychometric properties of the original MAIA (Mehling et al., 2018). As expected, test-retest reliability was somewhat lower, implying that MAIA-2 may, to some extent, assess state-like aspects of interoceptive awareness.

The Relevance of Experience With Mind-Body Practices For Interoceptive Awareness

A fundamental idea underlying the construction of the MAIA questionnaire was importance of distinguishing between anxiety-driven and mindful interoceptive styles, with the latter presumably enhanced through participation in various mind-body practices. Our study supports the relevance of mind-body practices in two key ways. First, the mind-body experience in our study were generally more interoceptively aware, and less likely to respond to unpleasant bodily sensations with distraction or worry, compared to students. Second, both years of experience and the number of weekly sessions of mind-body practices predicted approximately 5% to 10% of variance in most MAIA-2 dimensions (somewhat less than reported by Ferentzi et al., 2020). Interestingly, the number of weekly sessions tended to be a better predictor than the number of years of experience, suggesting that state-like aspects of interoceptive awareness may vary across different MAIA dimensions. As for the negative associations between years of practice and the Not-Distracting, there is no straightforward explanation. However, given that Not-Distracting is uncorrelated with other (g)MAIA dimensions, it is plausible that this dimension also encompasses certain responses associated to age-related bodily changes, which should be further explored.

Relations Between Interoceptive Awareness and Relevant Psychological Constructs

In line with their conceptual overlap, also reported in previous studies (Hanley et al., 2017; Jokić & Purić, 2020), all MAIA-2 dimensions in the current study were positively associated with mindfulness – although most correlations were stronger than we expected. One key distinction between our findings and those of prior research (Ferentzi et al., 2020; Jokić & Purić, 2020; Todd et al., 2020), lies in the nature of our sample. Specifically, mind-body practices emphasize aspects of interoceptive awareness that inherently involve mindfulness, thereby tightening the connection between the two constructs.

Overall, our results support the theoretically expected adaptive role of interoceptive sensibility. As hypothesized, dimensions of interoceptive awareness were mostly negatively related to anxiety (Bornemann et al., 2015; Ferentzi et al., 2020; Machorrinho et al., 2019; Shoji et al., 2018; Willem et al., 2022), and similar patterns of correlation were observed with depression and stress. These correlations were somewhat weaker than those reported in previous research, possibly due to methodological differences (for instance, we employed the DASS, whereas prior studies primarily used the STAI (Spielberger, 1983)). Conversely, the relationship with well-being was positive in both samples. Finally, higher interoceptive awareness was associated with more frequent use of the reappraisal strategy, and less frequent use of suppression. This finding further underscores the adaptive role of interoceptive awareness: emotional suppression is related to lower levels of positive emotions, poorer interpersonal relationships, and diminished quality of life, whereas the opposite is typically true for reappraisal (Kelley et al., 2019).

While, as predicted, most correlations between interoceptive awareness and basic personality traits were low, we also observed several notably stronger associations. The strongest correlations were registered between Not-Worrying and Emotionality, aligning with the recent proposition by Ferentzi et al. (2020) that Not-Worrying may serve as a measure of Emotionality. That finding also reflects the original intent of the MAIA authors to differentiate between adaptive and maladaptive forms of interoceptive awareness. Specifically, empirical evidence shows that heightened interoceptive awareness and somatosensory amplification are characteristic of anxiety, panic attacks/disorder, and hypochondriasis (Cioffi, 1991; Mehling et al., 2009), whereas reduced sensitivity to bodily signals is typical for eating disorders (Herbert & Pollatos, 2014; Pollatos et al., 2008), and maladaptive rumination on interoceptive signals is linked to depression (Watkins & Teasdale, 2004). On the other hand, the ability to recognise subtle body signals may support effective coping with various (psycho)somatic issues, such as fibromyalgia, chronic pain or eating disorders (Daubenmier, 2005; Gard, 2005; Mehling et al., 2005). Taken together with the aforementioned findings on well-being, it should be stressed once again that adaptive interoceptive sensibility is not merely a matter quantity (“the more, the better”), but rather of quality and the capacity to capture nuanced signals, and remain undisturbed by internal bodily sensations (Mehling et al., 2018, 2012).

Limitations

Since some of our findings are based on moderate-to-small sample sizes, they should be considered preliminary and require replication. Also, the majority of participants in both samples were women; therefore future studies should attempt to include more men.

Moreover, it is possible that our student sample included some individuals with experience in mind-body practices. However, this would theoretically lead to obtaining smaller effect sizes, thus working against our hypothesis regarding group differences. Future studies comparing practitioners and non-practitioners should strive to obtain more detailed information about all participants’

involvement with mind-body practices. On a more general level, it should be highlighted that our student and practitioners samples differ in numerous ways (e.g., in age, education, time of participation in the study). which presents an important limitation to the interpretation of group comparisons.

Finally, due to the cross-sectional nature of the study, we cannot draw conclusions about causal relationships between mind-body practices and interoceptive awareness. Future research should also incorporate neurophysiological indicators of interoceptive awareness alongside self-report measures.

Conclusion

Our study suggests that interoceptive awareness, as measured by MAIA-2, is best represented by fewer than the originally proposed eight dimensions. In addition to a general interoceptive awareness factor, Not-Worrying (closely, but inversely related to HEXACO Emotionality) and Not-Distracting (closely, but inversely related to the suppression strategy of emotion regulation) emerged as distinct, independent dimensions.

MAIA-2 demonstrated adequate reliability and showed the expected pattern of associations with relevant psychological constructs. Importantly, we established a clear relation between interoceptive awareness and mind-body experience, in terms of both group differences and as a function of the amount of experience with mind-body practices. Therefore, we recommend the use of the Serbian version of MAIA-2 in future research examining interoceptive awareness.

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Da li su dimenzije interoceptivne svesnosti iste za sve? Srpska validacija MAIA-2 na uzorcima sa različitim nivoom iskustva u praksama tela i uma

Multidimenzionalna procena interoceptivne svesnosti (MAIA) predstavlja široko korišćen instrument samoprocene za merenje interoceptivne svesnosti. Unapređena verzija, MAIA-2, još uvek nije temeljno validirana. Radi validacije srpskog prevoda MAIA-2, regrutovali smo dva uzorka: 214 učesnika sa iskustvom u praksama tela i uma i 229 univerzitetskih studenata. Za oba uzorka je takođe prikupljen niz relevantnih psiholoških mera. Iako je identifikovano manje faktora nego u originalnoj MAIA verziji, naši nalazi podržavaju tezu da adaptivni i maladaptivni aspekti interoceptivne svesnosti treba da budu razdvojeni. Pored toga, čini se da se faktorska struktura interoceptivne svesnosti razlikuje u zavisnosti od nivoa iskustva učesnika u praksama tela i uma. Posebno je značajno što su učesnici u praksama tela i uma postigli više rezultate na svim dimenzijama u poređenju sa studentima, a veće iskustvo u ovim praksama bilo je povezano sa izraženijom interoceptivnom svesnošću. U celini, MAIA-2 je pokazala zadovoljavajuću pouzdanost i smislen obrazac povezanosti sa drugim psihološkim konstruktima, što potvrđuje njenu korisnost kao mere interoceptivne svesnosti.

Ključne reči: interocepcija, interoceptivna svesnost, interoceptivna senzibilnost, MAIA, Multidimenzionalna procena interoceptivne svesnosti;

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Supplement A
Summary of Sample Experience With Mind-Body Practices

Table A1
Sample experience with mind-body practices

Practice	N_{exp} (%)	$N_{\text{most exp}}$ (%)
Yoga	145 (67.8)	94 (43.9)
Meditation or prayer	127 (59.3)	48 (22.4)
Eastern martial arts	52 (24.3)	40 (18.7)
Body psychotherapy	29 (13.6)	18 (8.4)
Tai chi	23 (10.7)	8 (3.7)
Other	20 (9.3)	4 (1.9)
Western martial arts	15 (7.0)	2 (0.9)

Notes. N_{exp} = number of participants that had experience with a practice; $N_{\text{most exp}}$ = number of participants who indicated that this particular practice was the one in which they were the most experienced.

Supplement B

R Packages Used in the Study

We used R packages *haven* (Wickham et al., 2023) and *tidyverse* (Wickham et al., 2019) for general data operations; *expss* (Demin, 2023) for computing descriptive statistics; *psych* (Revelle, 2023) for computing descriptive statistics, psychometric indices, and correlations; *Hmisc* (Harrell, 2023) for correlations; *EFAtools* (Steiner & Grieder, 2020) and *EFA.dimensions* (O'Connor, 2023) for exploratory factor analyses; *robustbase* (Maechler et al., 2023) for robust regressions; *rstatix* (Kassambara, 2023) and *deffectsize* (Delacre et al., 2021) for independent samples t-tests.

Supplement B References

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Supplement C
Scree Plots, Pattern and Structure Matrices, and Dimensions'
Intercorrelations From the Exploratory Factor Analysis,
for the Mind-Body Sample

Please note that values below $|\lambda| \geq .31$ were suppressed in all the matrices.

Figure C1
Scree plot with SMC-determined eigenvalues, mind-body sample

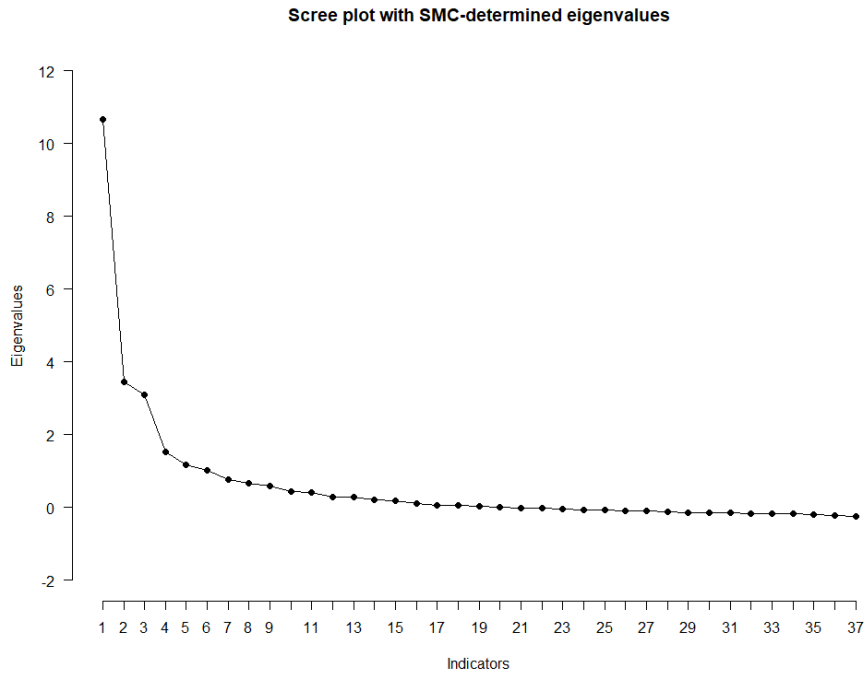


Figure C2
Scree plot with PCA-determined eigenvalues, mind-body sample

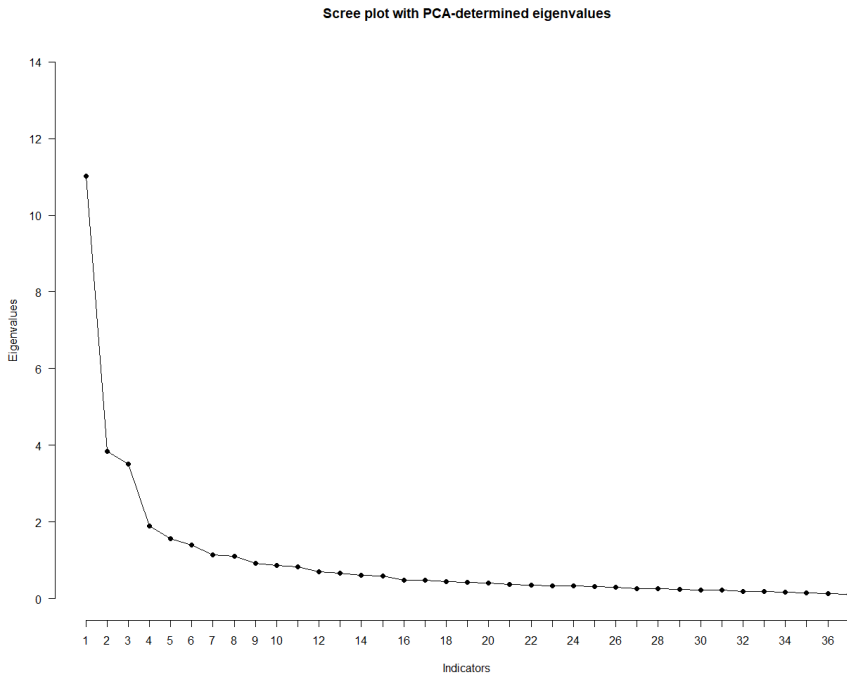


Table C1
Pattern matrix for 3-factor solution, mind-body sample

Item	Factor		
	1	2	3
MAIA2_1	.666		
MAIA2_2	.606		
MAIA2_3	.590		
MAIA2_4	.462		
MAIA2_5			.586
MAIA2_6			.636
MAIA2_7			.753
MAIA2_8			.786
MAIA2_9			.827
MAIA2_10			.763
MAIA2_11	-.318	.593	
MAIA2_12	-.385	.667	
MAIA2_13		.574	
MAIA2_14		.761	
MAIA2_15		.594	
MAIA2_16		.568	
MAIA2_17	.340	.429	
MAIA2_18		.577	
MAIA2_19		.638	
MAIA2_20		.588	
MAIA2_21		.622	
MAIA2_22		.620	
MAIA2_23	.728		
MAIA2_24	.832	-.347	
MAIA2_25	.753		
MAIA2_26	.595		
MAIA2_27	.784		
MAIA2_28		.421	
MAIA2_29	.311	.405	
MAIA2_30	.394	.316	
MAIA2_31	.328	.455	
MAIA2_32	.759		
MAIA2_33	.602		
MAIA2_34	.663		
MAIA2_35		.534	
MAIA2_36	.342	.447	
MAIA2_37	.573		

Table C2
Structure matrix for 3-factor solution, mind-body sample

Item	Factor		
	1	2	3
MAIA2_1	.578		
MAIA2_2	.550		
MAIA2_3	.597		
MAIA2_4	.444		
MAIA2_5			.599
MAIA2_6			.619
MAIA2_7			.751
MAIA2_8			.794
MAIA2_9			.824
MAIA2_10			.772
MAIA2_11		.452	
MAIA2_12		.487	
MAIA2_13		.513	
MAIA2_14		.613	
MAIA2_15		.466	
MAIA2_16	.444	.646	
MAIA2_17	.548	.595	
MAIA2_18	.322	.592	
MAIA2_19	.405	.679	
MAIA2_20	.502	.690	
MAIA2_21	.453	.690	
MAIA2_22	.541	.735	
MAIA2_23	.670		
MAIA2_24	.661		
MAIA2_25	.705		
MAIA2_26	.625	.360	
MAIA2_27	.709		
MAIA2_28	.517	.574	
MAIA2_29	.512	.560	
MAIA2_30	.561	.521	
MAIA2_31	.563	.624	
MAIA2_32	.777	.416	
MAIA2_33	.708	.514	
MAIA2_34	.742	.486	
MAIA2_35	.562	.683	
MAIA2_36	.583	.629	
MAIA2_37	.698	.526	

Table C3
Pattern matrix for 6-factor solution, mind-body sample

Item	Factor					
	1	2	3	4	5	6
MAIA2_1			.820			
MAIA2_2			.756			
MAIA2_3			.619			
MAIA2_4			.485			
MAIA2_5				.583		
MAIA2_6				.624		
MAIA2_7				.767		
MAIA2_8				.791		
MAIA2_9				.833		
MAIA2_10				.771		
MAIA2_11						.773
MAIA2_12						.868
MAIA2_13	.314					.329
MAIA2_14						.527
MAIA2_15						.569
MAIA2_16	.653					
MAIA2_17	.700					
MAIA2_18	.820					
MAIA2_19	.834					
MAIA2_20	.838					
MAIA2_21	.608					
MAIA2_22	.647					
MAIA2_23					.370	
MAIA2_24			.315		.390	
MAIA2_25					.648	
MAIA2_26					.862	
MAIA2_27					.547	
MAIA2_28		.515			.397	
MAIA2_29		.510			.331	
MAIA2_30					.565	
MAIA2_31					.371	
MAIA2_32		.453	.351			
MAIA2_33		.409				
MAIA2_34		.662				
MAIA2_35		.819				
MAIA2_36		.870				
MAIA2_37		.563				

Table C4
Structure matrix for 6-factor solution, mind-body sample

Item	Factor					
	1	2	3	4	5	6
MAIA2_1		.383	.754		.378	
MAIA2_2		.322	.704		.379	
MAIA2_3	.318	.450	.667		.418	
MAIA2_4			.513		.432	
MAIA2_5				.594		
MAIA2_6				.599		
MAIA2_7				.766		
MAIA2_8				.807		
MAIA2_9				.827		
MAIA2_10				.773		
MAIA2_11						.717
MAIA2_12						.808
MAIA2_13	.449					.442
MAIA2_14	.482					.635
MAIA2_15						.590
MAIA2_16	.714	.385			.474	.316
MAIA2_17	.719	.427	.433		.481	
MAIA2_18	.713	.314				
MAIA2_19	.784	.482				
MAIA2_20	.814	.516			.405	
MAIA2_21	.716	.507			.376	.325
MAIA2_22	.774	.587			.483	
MAIA2_23		.531	.516		.599	
MAIA2_24		.430	.596		.579	
MAIA2_25	.324	.451	.572		.745	
MAIA2_26	.365	.422	.409		.793	
MAIA2_27		.546	.526		.695	
MAIA2_28	.470	.639			.558	
MAIA2_29	.465	.630			.528	
MAIA2_30	.465	.473	.371		.655	
MAIA2_31	.573	.485	.432		.596	.388
MAIA2_32	.382	.699	.667		.612	
MAIA2_33	.481	.677	.562		.572	
MAIA2_34	.454	.783	.623		.500	
MAIA2_35	.567	.813	.325		.395	.329
MAIA2_36	.476	.830	.348		.438	.316
MAIA2_37	.443	.737	.568		.531	

Table C5
Pattern matrix for 8-factor solution, mind-body sample

Item	Factor							
	1	2	3	4	5	6	7	8
MAIA2_1					.737			
MAIA2_2					.766			
MAIA2_3					.616			
MAIA2_4					.395			
MAIA2_5			.574					
MAIA2_6			.632					
MAIA2_7			.759					
MAIA2_8			.788					
MAIA2_9			.822					
MAIA2_10			.774					
MAIA2_11						.776		
MAIA2_12						.902		
MAIA2_13								.761
MAIA2_14								.584
MAIA2_15						.609		
MAIA2_16	.612							
MAIA2_17	.658							
MAIA2_18	.822							
MAIA2_19	.819							
MAIA2_20	.874							
MAIA2_21	.706							
MAIA2_22	.768							
MAIA2_23				.650				
MAIA2_24				.924				
MAIA2_25				.578				
MAIA2_26				.468			.501	
MAIA2_27				.709				
MAIA2_28		.476						
MAIA2_29		.500						
MAIA2_30							.879	
MAIA2_31							.657	
MAIA2_32		.388						
MAIA2_33		.400						
MAIA2_34		.640						
MAIA2_35		.824						
MAIA2_36		.909						
MAIA2_37		.560						

Table C6
Structure matrix for 8-factor solution, mind-body sample

Item	Factor							
	1	2	3	4	5	6	7	8
MAIA2_1		.356		.498	.751			
MAIA2_2		.317		.389	.740		.340	
MAIA2_3	.343	.442		.449	.677		.333	
MAIA2_4				.407	.487		.374	
MAIA2_5			.589					
MAIA2_6			.606					
MAIA2_7			.765					
MAIA2_8			.806					
MAIA2_9			.823					
MAIA2_10			.778					
MAIA2_11						.767		.335
MAIA2_12						.866		.345
MAIA2_13	.386							.787
MAIA2_14	.429					.562		.740
MAIA2_15						.620		
MAIA2_16	.706	.392		.343			.529	.327
MAIA2_17	.717	.422		.427	.398		.472	.317
MAIA2_18	.707	.322					.339	
MAIA2_19	.778	.499					.364	
MAIA2_20	.830	.522		.327			.435	
MAIA2_21	.741	.507		.334		.348	.371	
MAIA2_22	.815	.586		.414		.338	.462	
MAIA2_23	.335	.477		.711	.430		.331	
MAIA2_24		.353		.811	.511			
MAIA2_25	.379	.404		.732	.497		.536	
MAIA2_26	.410	.396		.651	.338		.674	
MAIA2_27	.316	.487		.772	.433		.412	
MAIA2_28	.512	.644		.444		.344	.532	
MAIA2_29	.479	.630		.438			.514	
MAIA2_30	.452	.496		.425	.338		.857	
MAIA2_31	.555	.509		.384	.421	.317	.774	.325
MAIA2_32	.430	.669		.674	.615		.433	
MAIA2_33	.507	.666		.560	.523		.498	
MAIA2_34	.480	.767		.573	.586		.382	
MAIA2_35	.577	.832		.370		.331	.400	
MAIA2_36	.487	.855		.399	.321	.323	.440	
MAIA2_37	.459	.730		.557	.526		.444	

Table C7
Pattern matrix for 9-factor solution, mind-body sample

Item	Factor								
	1	2	3	4	5	6	7	8	9
MAIA2_1					.626				
MAIA2_2					.802				
MAIA2_3					.600				
MAIA2_4					.332				
MAIA2_5			.573						
MAIA2_6			.631						
MAIA2_7			.757						
MAIA2_8			.788						
MAIA2_9			.822						
MAIA2_10			.774						
MAIA2_11						.797			
MAIA2_12						.891			
MAIA2_13									.750
MAIA2_14									.597
MAIA2_15						.605			
MAIA2_16	.603								
MAIA2_17	.650								
MAIA2_18	.817								
MAIA2_19	.826								
MAIA2_20	.873								
MAIA2_21	.714								
MAIA2_22	.771								
MAIA2_23		.641							
MAIA2_24		.896							
MAIA2_25		.628							
MAIA2_26		.515					.468		
MAIA2_27		.722							
MAIA2_28				.371					
MAIA2_29				.392					
MAIA2_30							.858		
MAIA2_31							.743		
MAIA2_32								.675	
MAIA2_33								.689	
MAIA2_34								.667	
MAIA2_35				.786					
MAIA2_36				.937					
MAIA2_37				.510					

Table C8
Structure matrix for 9-factor solution, mind-body sample

Item	Factor								
	1	2	3	4	5	6	7	8	9
MAIA2_1		.488			.721			.496	
MAIA2_2		.394			.791		.341	.355	
MAIA2_3	.340	.453		.387	.675		.333	.450	
MAIA2_4		.405			.470		.371		
MAIA2_5			.588						
MAIA2_6			.607						
MAIA2_7			.764						
MAIA2_8			.805						
MAIA2_9			.823						
MAIA2_10			.778						
MAIA2_11						.781			.336
MAIA2_12						.857			.342
MAIA2_13	.386								.779
MAIA2_14	.431					.560			.743
MAIA2_15						.618			
MAIA2_16	.703	.349		.369			.530	.319	.326
MAIA2_17	.713	.428		.373	.360		.472	.405	.322
MAIA2_18	.707			.311			.342		
MAIA2_19	.782			.500			.368	.327	
MAIA2_20	.829	.326		.479			.442	.440	
MAIA2_21	.745	.325		.442		.373	.379	.475	
MAIA2_22	.817	.422		.568		.353	.466	.426	
MAIA2_23	.330	.706		.406	.374		.326	.492	
MAIA2_24		.797			.456			.482	
MAIA2_25	.376	.750		.357	.475		.527	.388	
MAIA2_26	.407	.673		.376	.313		.668	.315	
MAIA2_27	.313	.776		.427	.386		.404	.470	
MAIA2_28	.514	.454		.634		.358	.534	.438	
MAIA2_29	.481	.446		.616			.516	.437	
MAIA2_30	.451	.444		.470			.846	.387	
MAIA2_31	.552	.379		.426	.354	.344	.805	.523	.328
MAIA2_32	.421	.656		.518	.501		.441	.834	
MAIA2_33	.503	.536		.531	.404		.517	.801	
MAIA2_34	.474	.547		.642	.473		.390	.851	
MAIA2_35	.581	.382		.859		.346	.408	.533	
MAIA2_36	.487	.415		.915		.337	.446	.528	
MAIA2_37	.457	.565		.699	.481		.447	.586	

Table C9
MAIA-2 intercorrelations, mind-body sample (n = 214)

MAIA-2 scores	1	2	3	4	5	6
1. Attention regulation	-					
2. Listening and trusting	.62***	-				
3. Noticing	.35***	.50***	-			
4. Not-Distracting	.10	.16*	.10	-		
5. Emotional Awareness	.50***	.70***	.59***	.17*	-	
6. Not-Worrying	.38***	.32***	.08	.06	.12	-

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

Figure C3
Scree plot with SMC-determined eigenvalues, higher-order solution, mind-body sample

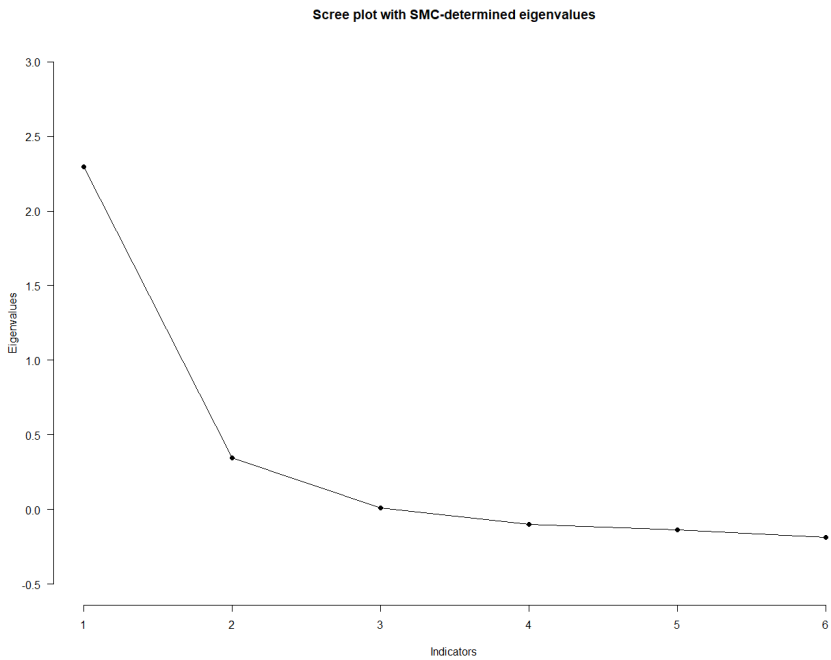


Figure C4
Scree plot with PCA-determined eigenvalues, higher-order solution, mind-body sample

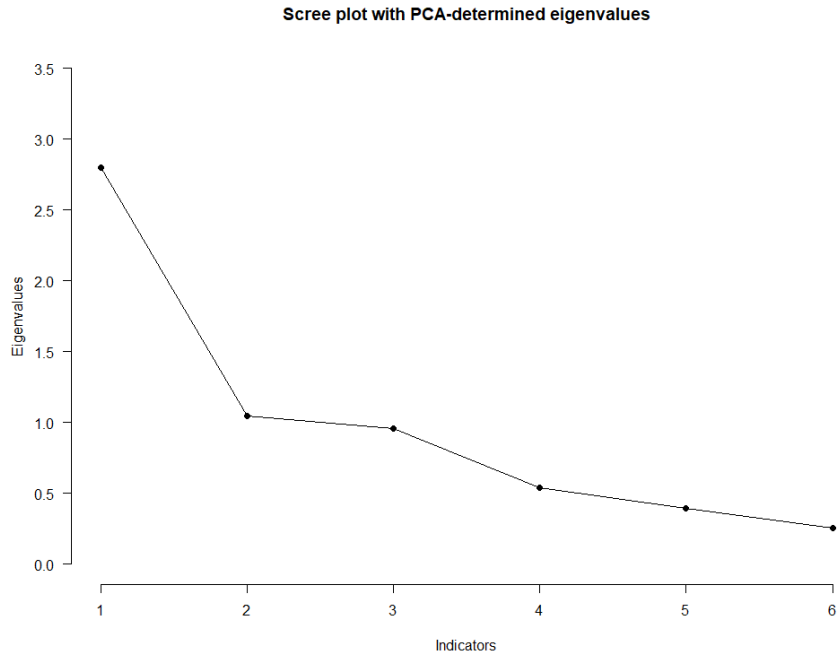


Table C10
Factor loadings for the higher-order solution, mind-body sample

Dimension	Factor
Attention Regulation	.674
Listening and trusting	.894
Noticing	.590
Not-Distracting	
Emotional Awareness	.796
Not-Worrying	.311

Supplement D
Scree Plots, Pattern and Structure Matrices, and Dimensions'
Intercorrelations From the Exploratory Factor Analysis, for the Student
Sample

Please note that values below $|\lambda| \geq .31$ were suppressed in all the matrices.

Figure D1
Scree plot with SMC-determined eigenvalues, student sample

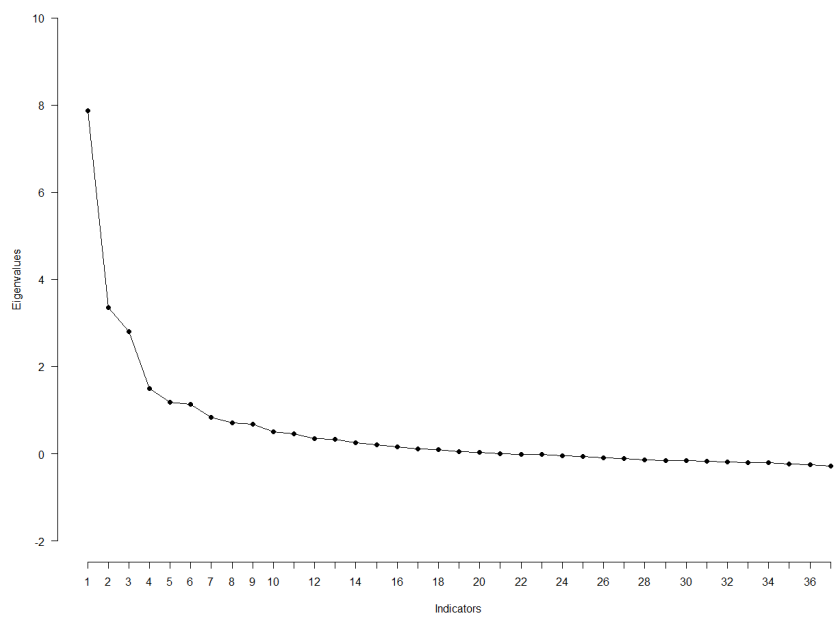


Figure D2
Scree plot with PCA-determined eigenvalues, student sample

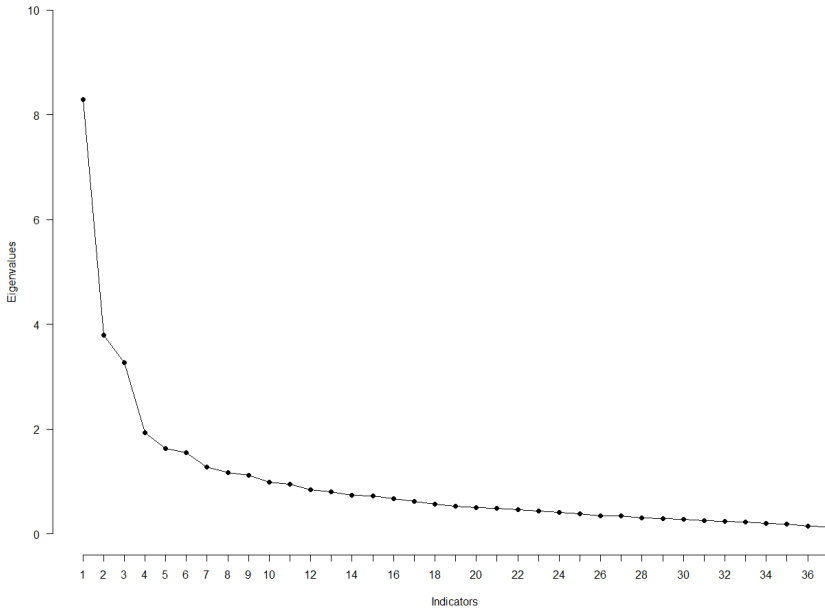


Table D1
Pattern matrix for 3-factor solution, student sample

Item	Factor		
	1	2	3
MAIA2_1	.551		
MAIA2_2	.393		
MAIA2_3	.480		
MAIA2_4	.370		
MAIA2_5			.529
MAIA2_6			.521
MAIA2_7			.655
MAIA2_8			.735
MAIA2_9			.648
MAIA2_10			.733
MAIA2_11		.638	
MAIA2_12		.758	
MAIA2_13		.643	
MAIA2_14		.709	
MAIA2_15		.747	
MAIA2_16	.508		
MAIA2_17	.569		
MAIA2_18	.344		
MAIA2_19	.456		
MAIA2_20	.586		
MAIA2_21	.506		
MAIA2_22	.598		
MAIA2_23	.402		
MAIA2_24	.528		
MAIA2_25	.642		
MAIA2_26	.570		
MAIA2_27	.584		
MAIA2_28	.425		
MAIA2_29	.700		
MAIA2_30	.536		
MAIA2_31	.580		
MAIA2_32	.675		
MAIA2_33	.633		
MAIA2_34	.590		
MAIA2_35	.475		
MAIA2_36	.487		
MAIA2_37	.507		

Table D2
Structure matrix for 3-factor solution, student sample

Item	Factor		
	1	2	3
MAIA2_1	.539		
MAIA2_2	.359		
MAIA2_3	.458		
MAIA2_4	.338		
MAIA2_5			.547
MAIA2_6			.513
MAIA2_7			.666
MAIA2_8			.745
MAIA2_9			.632
MAIA2_10			.719
MAIA2_11		.629	
MAIA2_12		.751	
MAIA2_13		.649	
MAIA2_14		.721	
MAIA2_15		.746	
MAIA2_16	.511		
MAIA2_17	.560		
MAIA2_18	.347		
MAIA2_19	.464		
MAIA2_20	.590		
MAIA2_21	.520		
MAIA2_22	.613		
MAIA2_23	.386		
MAIA2_24	.502		
MAIA2_25	.620		
MAIA2_26	.546		
MAIA2_27	.559		
MAIA2_28	.460	.325	
MAIA2_29	.723		
MAIA2_30	.553		
MAIA2_31	.615		
MAIA2_32	.662		
MAIA2_33	.641		
MAIA2_34	.591		
MAIA2_35	.500		
MAIA2_36	.523		
MAIA2_37	.523		

Table D3
Pattern matrix for 4-factor solution, student sample

Item	Factor			
	1	2	3	4
MAIA2_1		.688		
MAIA2_2		.462		
MAIA2_3		.435		
MAIA2_4		.349		
MAIA2_5				.524
MAIA2_6				.528
MAIA2_7				.653
MAIA2_8				.732
MAIA2_9				.655
MAIA2_10				.741
MAIA2_11			.701	
MAIA2_12			.780	
MAIA2_13			.718	
MAIA2_14			.764	
MAIA2_15			.664	
MAIA2_16	.476			
MAIA2_17	.384			
MAIA2_18	.397			
MAIA2_19	.621			
MAIA2_20	.605			
MAIA2_21	.655			
MAIA2_22	.687			
MAIA2_23		.548		
MAIA2_24		.691		
MAIA2_25		.725		
MAIA2_26		.600		
MAIA2_27		.684		
MAIA2_28	.447			
MAIA2_29	.499			
MAIA2_30	.344			
MAIA2_31	.365			
MAIA2_32		.618		
MAIA2_33		.414		
MAIA2_34		.554		
MAIA2_35	.790			
MAIA2_36	.729			
MAIA2_37	.506			

Table D4
Structure matrix for 4-factor solution, student sample

Item	Factor			
	1	2	3	4
MAIA2_1	.353	.627		
MAIA2_2		.426		
MAIA2_3	.337	.486		
MAIA2_4		.380		
MAIA2_5				.551
MAIA2_6				.513
MAIA2_7				.666
MAIA2_8				.748
MAIA2_9				.630
MAIA2_10				.719
MAIA2_11			.677	
MAIA2_12			.779	
MAIA2_13			.706	
MAIA2_14			.770	
MAIA2_15			.718	
MAIA2_16	.542	.379		
MAIA2_17	.530	.477		
MAIA2_18	.377			
MAIA2_19	.554			
MAIA2_20	.631	.438		
MAIA2_21	.598	.349		
MAIA2_22	.680	.435		
MAIA2_23		.466		
MAIA2_24		.612		
MAIA2_25	.415	.709		
MAIA2_26	.373	.611		
MAIA2_27	.352	.658		
MAIA2_28	.515	.314		
MAIA2_29	.703	.599		
MAIA2_30	.516	.479		
MAIA2_31	.589	.518		
MAIA2_32	.503	.690		
MAIA2_33	.566	.588		
MAIA2_34	.464	.605		
MAIA2_35	.646			
MAIA2_36	.649			
MAIA2_37	.552	.395		

Table D5
Pattern matrix for 6-factor solution, student sample

Item	Factor					
	1	2	3	4	5	6
MAIA2_1	.701					
MAIA2_2	.533					
MAIA2_3	.458					
MAIA2_4						
MAIA2_5				.511		
MAIA2_6				.561		
MAIA2_7				.611		
MAIA2_8				.679		
MAIA2_9				.709		
MAIA2_10				.778		
MAIA2_11		.686				
MAIA2_12		.784				
MAIA2_13		.729				
MAIA2_14		.773				
MAIA2_15		.658				
MAIA2_16			.513			
MAIA2_17			.582			
MAIA2_18			.401			
MAIA2_19			.780			
MAIA2_20			.694			
MAIA2_21			.381			
MAIA2_22			.372			.312
MAIA2_23	.596					
MAIA2_24	.664					
MAIA2_25	.663					
MAIA2_26	.430				.445	
MAIA2_27	.605					
MAIA2_28					.598	
MAIA2_29					.553	
MAIA2_30					.748	
MAIA2_31					.725	
MAIA2_32	.538					
MAIA2_33					.356	
MAIA2_34	.519					
MAIA2_35						.880
MAIA2_36						.873
MAIA2_37						.585

Table D6
Structure matrix for 6-factor solution, student sample

Item	Factor					
	1	2	3	4	5	6
MAIA2_1	.652		.353			
MAIA2_2	.478		.360			
MAIA2_3	.503		.322			
MAIA2_4	.380					
MAIA2_5				.539		
MAIA2_6				.539		
MAIA2_7				.648		
MAIA2_8				.724		
MAIA2_9				.680		
MAIA2_10				.755		
MAIA2_11		.670				
MAIA2_12		.780				
MAIA2_13		.713				
MAIA2_14		.774				
MAIA2_15		.712				
MAIA2_16	.327		.609		.397	
MAIA2_17	.449		.655		.362	
MAIA2_18			.403		.313	
MAIA2_19			.729			.345
MAIA2_20	.407		.736		.380	.376
MAIA2_21	.326		.520		.390	.476
MAIA2_22	.412		.579		.451	.554
MAIA2_23	.499					
MAIA2_24	.628					
MAIA2_25	.704				.456	
MAIA2_26	.575				.555	
MAIA2_27	.652				.490	
MAIA2_28					.597	.401
MAIA2_29	.519		.493		.740	.519
MAIA2_30	.377		.361		.717	
MAIA2_31	.420		.368		.765	.392
MAIA2_32	.670		.426		.492	.326
MAIA2_33	.540		.431		.577	.386
MAIA2_34	.593		.346		.448	.353
MAIA2_35			.357		.423	.843
MAIA2_36			.363		.410	.853
MAIA2_37	.427		.397			.634

Table D7
Pattern matrix for 8-factor solution, student sample

Item	Factor							
	1	2	3	4	5	6	7	8
MAIA2_1	.678							
MAIA2_2	.539		-.324					
MAIA2_3	.447							
MAIA2_4								
MAIA2_5				.488				
MAIA2_6				.558				
MAIA2_7				.605				
MAIA2_8				.666				
MAIA2_9				.740				
MAIA2_10				.803				
MAIA2_11		.689						
MAIA2_12		.851						
MAIA2_13		.694						
MAIA2_14		.726						
MAIA2_15		.678						
MAIA2_16							.727	
MAIA2_17							.624	
MAIA2_18					.565			.358
MAIA2_19					.788			
MAIA2_20					.704			
MAIA2_21					.534			
MAIA2_22					.361			
MAIA2_23	.565							
MAIA2_24	.655							
MAIA2_25	.609							.406
MAIA2_26	.328							.518
MAIA2_27	.539							.524
MAIA2_28			.719					
MAIA2_29			.585					
MAIA2_30			.633					
MAIA2_31			.671					
MAIA2_32	.545		.320					
MAIA2_33			.619					
MAIA2_34	.510							
MAIA2_35						.861		
MAIA2_36						.927		
MAIA2_37						.522		

Table D8
Structure matrix for 8-factor solution, student sample

Item	Factor							
	1	2	3	4	5	6	7	8
MAIA2_1	.650		.314					
MAIA2_2	.485						.353	
MAIA2_3	.498							
MAIA2_4	.330							
MAIA2_5				.535				
MAIA2_6				.538				
MAIA2_7				.657				.312
MAIA2_8				.717				
MAIA2_9				.689				
MAIA2_10				.764				
MAIA2_11		.678						
MAIA2_12		.816						
MAIA2_13		.698						
MAIA2_14		.754						
MAIA2_15		.721						
MAIA2_16			.394		.424	.314	.799	
MAIA2_17	.452		.404		.480		.721	
MAIA2_18					.462			
MAIA2_19					.741	.314	.380	
MAIA2_20	.413		.425		.748	.336	.389	
MAIA2_21	.367		.493		.637	.421		
MAIA2_22	.459		.569		.629	.505		
MAIA2_23	.494							
MAIA2_24	.628		.318					
MAIA2_25	.637		.368					.437
MAIA2_26	.464		.421					.559
MAIA2_27	.565		.375					.550
MAIA2_28			.642			.363		
MAIA2_29	.485		.742		.477	.480		
MAIA2_30			.624		.343			.361
MAIA2_31	.363		.712		.366	.357		
MAIA2_32	.702		.576		.417			
MAIA2_33	.588		.717		.423	.317		
MAIA2_34	.623		.537		.317	.311		
MAIA2_35			.455		.396	.851		
MAIA2_36			.433		.389	.901		
MAIA2_37	.438		.335		.444	.622		

Table D9
Pattern matrix for 11-factor solution, student sample

Item	Factor										
	1	2	3	4	5	6	7	8	9	10	11
MAIA2_1									.559		
MAIA2_2									.729		
MAIA2_3									.385		
MAIA2_4							.356				
MAIA2_5		.484									
MAIA2_6		.522									
MAIA2_7		.604									.442
MAIA2_8		.660									
MAIA2_9		.811									
MAIA2_10		.795									
MAIA2_11	.727										
MAIA2_12	.878										
MAIA2_13	.631										-.328
MAIA2_14	.690										
MAIA2_15	.685										
MAIA2_16										.817	
MAIA2_17										.656	
MAIA2_18				.558							
MAIA2_19				.791							
MAIA2_20				.728							
MAIA2_21				.515		.312					
MAIA2_22				.346		.314					
MAIA2_23								.570			
MAIA2_24								.778			
MAIA2_25							.425				
MAIA2_26							.836				
MAIA2_27							.645	.342			
MAIA2_28						.358					
MAIA2_29					.390						
MAIA2_30					.939						
MAIA2_31					.866						
MAIA2_32						.535					
MAIA2_33						.789					
MAIA2_34						.778					
MAIA2_35			.907								
MAIA2_36			.998								
MAIA2_37			.543								

Table D10*Structure matrix for 11-factor solution, student sample*

Item	Factor										
	1	2	3	4	5	6	7	8	9	10	11
MAIA2_1					.356	.417	.322	.567	.670		
MAIA2_2								.312	.725		
MAIA2_3				.311		.394	.378		.477		
MAIA2_4							.414				
MAIA2_5		.515									
MAIA2_6		.527									
MAIA2_7		.636									.488
MAIA2_8		.700									.349
MAIA2_9		.770									
MAIA2_10		.784									
MAIA2_11	.704										
MAIA2_12	.844										
MAIA2_13	.680										-.431
MAIA2_14	.739										
MAIA2_15	.723										
MAIA2_16			.345	.438	.385	.342				.880	
MAIA2_17				.489	.318	.459		.325	.331	.761	
MAIA2_18				.479							
MAIA2_19			.341	.742		.340				.372	
MAIA2_20			.375	.767	.371	.428		.408		.446	
MAIA2_21			.455	.625	.379	.521					
MAIA2_22			.546	.614	.420	.594		.337			
MAIA2_23						.310	.325	.564			
MAIA2_24						.415	.360	.766	.366		
MAIA2_25			.326	.340	.423	.402	.658	.606	.465		
MAIA2_26					.417	.421	.836	.385			
MAIA2_27					.375	.390	.772	.609			
MAIA2_28			.408		.516	.513					
MAIA2_29			.539	.503	.696	.625	.441	.463		.379	
MAIA2_30				.368	.841	.406	.388				
MAIA2_31			.412	.363	.866	.520	.341	.348			
MAIA2_32			.320	.396	.451	.683	.378	.583	.423		
MAIA2_33			.377	.425	.489	.792	.365	.425			
MAIA2_34			.344		.332	.716	.374	.459	.349		
MAIA2_35			.844	.396	.369	.409					
MAIA2_36			.901	.377	.371	.397					
MAIA2_37			.628	.450		.404		.319			

Table D11
MAIA-2 intercorrelations, student sample (n = 229)

MAIA-2 scores	1	2	3
1. gMAIA	—		
2. Not-Worrying	.10	—	
3. Not-Distracting	.06	-.06	—

Note. gMAIA = general MAIA factor.

Supplement E

Descriptive Statistics and Psychometric Properties of the Questionnaires

Table E1

Descriptive statistics and psychometric properties of the questionnaires for the mind-body sample

Scale	n	M	SD	Min	Max	Sk	Ku	S-W	α
MAAS	204	4.28	0.76	1.40	5.67	-0.63	0.47	0.973***	.89
DASS Depression	199	0.67	0.65	0.00	3.00	1.24	1.18	0.870***	.89
DASS Anxiety	199	0.66	0.50	0.00	2.71	1.06	1.58	0.921***	.71
DASS Stress	199	1.11	0.63	0.00	3.00	0.46	-0.05	0.973***	.86
ERQ Reappraisal	198	3.59	0.72	1.00	5.00	-0.65	0.69	0.963***	.82
ERQ Suppression	198	2.45	0.90	1.00	5.00	0.34	-0.64	0.966***	.80
SHS	199	5.20	1.12	2.00	7.00	-0.45	-0.28	0.970***	.79
SWLS	199	4.91	1.26	1.20	7.00	-0.38	-0.33	0.976**	.88
Honesty-Humility	130	3.85	0.66	1.50	5.00	-0.64	0.62	0.967**	.78
Emotionality	130	2.98	0.61	1.20	4.30	-0.32	0.07	0.987	.72
eXtraversion	130	3.38	0.58	1.90	4.60	-0.38	-0.26	0.982	.73
Agreeableness	130	3.38	0.61	1.50	4.80	-0.58	0.54	0.973*	.76
Conscientiousness	130	3.77	0.60	2.20	5.00	-0.33	-0.41	0.981	.77
Openness	130	4.07	0.51	2.00	5.00	-0.91	1.22	0.948***	.69
Disintegration	122	2.06	0.65	1.10	5.00	1.11	2.18	0.929***	.90

Notes. SHS = Subjective Happiness Scale; SWLS = Satisfaction With Life Scale; S-W = Shapiro-Wilk Test for Normality; α = Cronbach's alpha;

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

Table E2

Descriptive statistics and psychometric properties of the questionnaires for the student sample

Scale	n	M	SD	Min	Max	Sk	Ku	S-W	α
SHS	229	4.49	1.33	1.00	7.00	-0.32	-0.35	0.981**	.85
Honesty-Humility	217	3.59	0.60	1.44	4.88	-0.62	0.49	0.975***	.78
Emotionality	217	3.48	0.62	1.88	4.88	-0.32	-0.19	0.988	.81
eXtraversion	217	3.23	0.77	1.31	4.75	-0.21	-0.70	0.983*	.90
Agreeableness	217	3.07	0.72	1.31	4.75	-0.14	-0.49	0.989	.87
Conscientiousness	217	3.69	0.66	1.94	4.94	-0.48	-0.31	0.973***	.86
Openness	217	3.91	0.60	1.69	4.88	-0.98	1.09	0.941***	.82
Disintegration	218	2.22	0.50	1.10	3.81	0.43	0.15	0.987*	.96

Notes. SHS = Subjective Happiness Scale; S-W = Shapiro-Wilk Test for Normality; α = Cronbach's alpha;

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

Supplement F
Correlations Between MAIA-2 and Other Questionnaires

Table F1
Spearman's correlations of MAIA-2 with mindfulness, negative emotionality, well-being, and emotion regulation for the mind-body sample

MAIA-2	MAAS ^a	DASS-D ^b	DASS-A ^b	DASS-S ^b	SHS ^b	SWLS ^b	ERQ-R ^c	ERQ-S ^c
gMAIA	.47***	-.30***	-.25***	-.34***	.49***	.36***	.45***	-.18**
Attention regulation	.47***	-.28***	-.29***	-.38***	.41***	.29***	.37***	-.11
Listening and trusting	.43***	-.31***	-.24***	-.34***	.51***	.40***	.43***	-.18*
Noticing	.33***	-.15*	-.15*	-.20**	.24***	.19**	.25***	-.18*
Emotional Awareness	.36***	-.19**	-.11	-.19**	.39***	.24***	.34***	-.23**
Not-Distracting	.34***	-.21**	-.17*	-.27***	.23**	.25***	-.09	-.45***
Not-Worrying	.34***	-.37***	-.40***	-.45***	.35***	.25***	.17*	-.15*

Notes. gMAIA = general MAIA factor; DASS-D = Depression; DASS-A = Anxiety; DASS-S = Stress; SHS = Subjective Happiness Scale; SWLS = Satisfaction With Life Scale; ERQ-R = Reappraisal; ERQ-S = Suppression.

^a *n* = 204. ^b *n* = 199. ^c *n* = 198.
p* < .05. *p* < .01. ****p* < .001.

Table F2
Spearman's correlations of MAIA-2 with well-being and personality traits for the student sample

MAIA-2	SHS ^a	H ^b	E ^b	X ^b	A ^b	C ^b	O ^b	D ^c
gMAIA	.35***	.06	.002	.24***	.03	.15*	.08	-.06
Not-Distracting	.15*	-.03	.12	.17*	.20**	.05	.07	-.19**
Not-Worrying	.18**	.16*	-.40***	.10	.07	.24***	.12	-.21**

Notes. gMAIA = general MAIA factor; SHS = Subjective Happiness Scale; H = Honesty-Humility; E = Emotionality; X = eXtraversion; A = Agreeableness; C = Conscientiousness; O = Openness to Experience; D = Disintegration.

^a *n* = 229. ^b *n* = 217. ^c *n* = 218.
p* < .05. *p* < .01. ****p* < .001.

Table F3*Spearman's correlations of MAIA-2 with personality traits for the mind-body sample*

MAIA-2	H ^a	E ^a	X ^a	A ^a	C ^a	O ^a	D ^b
gMAIA	.18*	-.29***	.38***	.26**	.15	.28**	-.18
Attention regulation	.11	-.29***	.36***	.19*	.19*	.29***	-.18*
Listening and trusting	.20*	-.28**	.45***	.29***	.15	.24**	-.19*
Noticing	.18*	-.13	.05	.19*	.09	.16	-.17
Emotional Awareness	.11	-.15	.31***	.14	.12	.25**	-.08
Not-Distracting	.13	-.13	.22*	.04	.05	.05	-.19*
Not-Worrying	.35***	-.50***	.26**	.32***	.07	-.003	-.40***

Notes. gMAIA = general MAIA factor; H = Honesty-Humility; E = Emotionality; X = eXtraversion; A = Agreeableness; C = Conscientiousness; O = Openness to Experience; D= Disintegration.

^a $n = 130$. ^b $n = 122$.

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