MEASURING PRE-REFLEXIVE CONSCIOUSNESS: 
THE HUNGARIAN VALIDATION OF THE MINDFUL 
ATTENTION AWARENESS SCALE (MAAS)

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Mindfulness is defined as an enhanced state of attention and awareness characterized by an open, 
non-judgmental pre-reflexive information processing style. Although there are different questionnaires 
measuring trait mindfulness, validated Hungarian versions are still lacking. One of the most widely 
used questionnaire for the measurement of dispositional mindfulness is the Mindful Attention Aware-
ness Scale (MAAS) developed by Brown and Ryan (2003). In the present study, psychometric prop-
ties and personality correlates of the Hungarian version of the Scale (MAAS-H) were investigated on 
a student sample (N = 511). The scale has good internal consistency (Cronbach’s alfa = 0.78), a single 
factor structure and a test-retest reliability of 0.71 over a two months period. MAAS showed medium 
level correlations (Kendall’s tau_b = 0.18 and 0.19) with positive affectivity (PANAS+) and well-being 
(WB-5), and negative correlations (–0.22, –0.26 and –0.33) with various measures related to negative 
affectivity (PHQ-15, PANAS– and STAI-T, respectively). Correlation with private body consciousness 
(PBCS) was quite low (~0.09). Our results indicate that the psychometric qualities of the Hungarian 
version of the Mindful Attention Awareness Scale are in coherence with the original scale, and thus 
proved to be a valid tool in order to quantify dispositional mindfulness.

Keywords: mindfulness, MAAS, emotional regulation

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INTRODUCTION

Originating in Buddhist philosophy and religious practices, mindfulness is defined as an enhanced state of awareness characterized by focused attention towards internal and external present moment experiences in an open, receptive and non-judgmental information processing style (Brown & Ryan 2003). Thanks to the growing interest in Far Eastern meditation and relaxation techniques, mindfulness based self-regulation infiltrated into the treatment protocols of modern cognitive and behaviour therapies developed for different psychiatric, psychosomatic or somatic disorders (Kabat-Zinn et al. 1992; Linehan 1993; Speca et al. 2000; Williams et al. 2001).

While in the last two decades Mindfulness Based Stress Reduction proved to be a successful treatment procedure for clinical and non-clinical populations, the mechanism of its beneficial effect is still far from being fully understood (Dobkin 2008). Nevertheless in the last decade several evidence-based investigations aimed to describe, operationalize, measure and unravel the “halo” of this intriguing psychological construct (Brown & Ryan, 2003; Baer, Smith & Allen 2004). Since mindfulness seemed to be an adaptive skill promoting self-regulation, stress reduction and positive emotional states, the operationalization of dispositional mindfulness might have been expected to be shaped by the constraints of our preconceptions considering mindfulness as a dimension of emotional regulation.

Nevertheless, the Mindful Attention Awareness Scale (MAAS), measuring trait mindfulness, developed by Brown and Ryan (2003) does not contain any content that relates directly to emotions or emotional regulation. Indeed, the 15 items are free from motivational and attitudinal components relating to positive emotional states. Moreover, the psychometric properties of the scale suggest that the MAAS reflects a unique property of human consciousness. Since MAAS aims to measure a receptive attentional stance toward inner and outer present moment experiences it was (moderately) related to the Openness to Experience Factor of the NEO-PI (Costa & McCrae 1992) and to measures of emotional intelligence (Trait Meta-Mood Scale; Salovey et al. 1995). But mindfulness is not a marker of self-consciousness characterized by higher-order, self-reflective thoughts. In contrast mindful states are more perceptual or pre-reflective, “operating on, rather than within, thought, feeling, and other contents of consciousness” (Brown & Ryan 2003, p.823). For example one can be mindfully aware of a disagreeable social situation and the resulting subtle mental imbalance, without entering into anxiety provoking, ruminative, ego-threatening thoughts about his/her abilities or adequacy in the difficult situation. Ruminative thought processes, verbal representations of the self, worries about the past or the future interfere with the receptive attention of the present moment. Similarly, one can be mindfully aware of a pleasant feeling without labelling or categorizing the experience in more abstract, self-reflective representations. Labelling or reflecting on a highly pleasant state generally activates more self-focused autobiographical memories again interfering with the “flow” of the present moment. In concordance with these assumptions, according to Brown and Ryan’s report (2003) the Mindful Attention Awareness Scale (MAAS) showed a negative correlation with the Self-Consciousness Scale (Fenigstein et al. 1975).

Thereafter, a mounting body of evidence indicated that mindfulness, measured by the MAAS is an important emotion regulatory skill promoting higher levels of well-being.
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(Brown & Ryan 2003; Weinstein, Brown & Ryan 2009) and moderating negative outcomes of neuroticism (Feltman, Robinson & Ode 2010). MAAS was positively related to a higher use of approach coping instead of avoidant coping strategies (Weinstein et al. 2009) and it proved to be a positive correlate of such personality traits as Conscientiousness, Agreeableness and Positive Affect, while it was a negative correlate of Neuroticism and Negative Affect (Giluk 2009). Lower levels of mindfulness were related to emotional disregulation and predicted symptom severity in Generalized Anxiety Disorder (Roemer et al. 2009) and in Borderline Personality Disorder (Wupperman et al. 2009). These findings indicate that mindfulness mitigates emotional reactivity to threatening situations (Arch & Craske 2010), and facilitates quicker recovery from unpleasant emotional states (Broderick 2005).

The mechanism of these benign effects on stress reduction is not fully understood, but research on the neuropsychological aspects of trait mindfulness and mindful meditation indicates that this unique state of awareness may provide enhanced attentional capacities and cognitive flexibility (Moore & Malinowski 2009; Zeidan et al. 2010) allowing the perception of different bodily sensations and feelings as objects of attention. This mode of distancing and mentalizing along with a non-judgmental, accepting attitude lays the bases for an adaptive mental state resulting in flexible, approaching and problem-solving responses instead of impulsive affective reactions or ruminative, negatively toned, ego-threatening thought processes.

Beyond the introspective, questionnaire-based and behavioural measures, recently the positive effects of mindfulness were captured by physiological measurements as well. Delgado and colleagues (2010) examining the differential effects on emotional regulation of a mindfulness based training program in contrast to a relaxation training, found that while both programs showed post-treatment improvements, mindfulness training surpassed the relaxation training regarding the somatic and autonomic regulation of evoked stress.

Aiming to examine the neural underpinnings of mindfulness, Creswell and colleagues (2007) found that dispositional mindfulness was associated with greater widespread prefrontal activation and reduced amygdalar activation. Moreover, they found a reciprocal activation between the ventromedial prefrontal cortex and the amygdala in individuals characterized by high dispositional mindfulness. Mindfulness based relaxation was also associated with enhanced frontal mid-line theta power (Chan, Han & Cheung 2008), reflecting activation in the Anterior Cingulated and Medial Prefrontal Cortex (Asada et al. 1999). These results suggest that mindfulness may exert its influence on emotional regulation by a top-down effect of attentional and cognitive control, however, more recent data indicates that mindfulness may also enhance bottom-up sensory processing (Farb, Anderson & Mayberg 2010; Hurk et al. 2010) as well.

As we have seen, mindfulness apart from capturing a singular mental state characterized by a particular information processing mode is also an interesting encounter point between clinical and cognitive psychological research. Since mindfulness is an enhanced state of attention and awareness facilitating emotional regulation, the thorough investigation of this psychological construct would shed more light on the interplay between cognitive and affective systems, the so-called cognitive-affective dialogue.

While there are different questionnaire based measures of mindfulness (Baer et al. 2006), the most widely used questionnaire is still the MAAS that proved to be a reliable and valid
in several investigations (Brown & Ryan 2003; Carlson, Brown 2005; Weinstein et al. 2009). MAAS aims to measure dispositional mindfulness using 15 items forming a one factor structure. Since the validated questionnaires measuring mindfulness in Hungarian are still lacking, our aim was to fill this gap by reporting our experiences with the psychometric properties of the Hungarian version of Mindful Attention Awareness Scale (MAAS-H). In the following sections we will report the reliability, the convergent and discriminant validity assessments of the questionnaire.

METHOD

Participants and procedure

Participants, including 511 undergraduate university students (185 males, 326 females) were recruited from two different introductory psychology courses, one held at the Budapest University of Technology and Economics, and the other at the Eötvös Loránd University. Mean age of the subjects was 20.85 (SD = 1.63) years. Subjects were asked to complete an online questionnaire examining different aspects on the relation between personality dimensions and casual somatic symptoms (headache, stomach-ache, dizziness, etc.) This online questionnaire was part of a larger investigation examining the background of casual somatic and psychosomatic symptoms as well as the psychological aspects of sleep disturbances. In order to examine the test-retest reliability of the MAAS, 100 randomly selected subjects were asked to complete again the questionnaire after two month of the first assessment.

Informed consent was obtained from the participants and the Local Ethical Committee of the Budapest University of Technology and Economics approved the study protocol.

Measures

Mindful Attention and Awareness Scale (MAAS)

We used the MAAS (Brown & Ryan 2003) which employs 15 items measuring the extent to which one is able to pay attention to the present moment in an open and non-judgemental way. The questions include both general and situation specific elements to weigh the frequency of mindful states. Each of the items is stated inversely using a 6-point Likert scale (from almost always to almost never) asking the respondents of how often they find themselves acting automatically, inattentively or being preoccupied. According to the literature (Brown & Ryan 2003), the English version of the scale has a single factor structure and yields a single total score with higher scores indicating higher levels of mindfulness. Brown and Ryan reported the internal consistency of the measure ($\alpha = 0.82$), its test-retest reliability ($r = 0.81$) and its convergent validity with related measures (e.g., positive correlations with well-being). The Hungarian version was back-translated into English and was checked by a native speaker. In the present study the internal consistency of the scale was Cronbach’s $\alpha = 0.78$ (see detailed description below). Test-retest reliability of the scale over a two months interval was 0.71 ($N = 100; p < 0.001$) in the present study.
Spielberger State Trait Anxiety Inventory (STAI)
The STAI (Spielberger, Gorsuch & Lusgene 1970) is a widely used self-report instrument that differentiates between the temporary condition of state anxiety and the long-standing quality of trait anxiety. We used the 20 item Hungarian version of STAI trait anxiety questionnaire (STAI-T) in order to assess general levels of anxiety (Sipos, Sipos & Spielberger 1994). The questions are scored on a 4-point Likert scale. In the present work we verified the previous results showing the STAI-T to have an excellent internally consistency. The Cronbach’s α of the STAI-trait inventory was 0.88.

Who Well-Being-5 (WB-5)
The 5-item Well-Being questionnaire was developed by Bech, Gudex and Johansen (1996). The short questionnaire measures the general mood that characterized the individuals in the last two weeks. The WB-5 applying a 4-point Likert scale does not contain any inverse items. The Hungarian version was validated by Susánszky and colleagues (Susánszky et al. 2006). According to previous studies the internal consistency of the scale was between (Susánszky et al. 2006; Stauder & Konkoly Thege 2006; Bérdi & Köteles 2010) 0.69 and 0.85. In the present study the Cronbach’s α was 0.76.

Positive and Negative Affectivity Schedule (PANAS)
The questionnaire containing 20 items was developed by Watson, Clark and Tellegen (1988) in order to measure positive and negative affective states. The original questionnaire includes 10-10 positive and negative emotional states that should be answered on a 5-point Likert scale. The negative and positive sub-scales represent two relatively independent scales. The questionnaire was translated by Rózsa and Kő (Rózsa et al. 2008). In this version the negative affective sub-scale was extended by an additional item (“angry”) following the suggestion of Cecile and colleagues (1996). The Cronbach alpha indices of the two subscales are between 0.85 and 0.90 (Rózsa et al. 2008). Recently, a Hungarian study reported similar results: 0.86 for the negative and 0.82 for the positive sub-scale (Simor, Köteles & Bódizs, 2011). The present study found basically the same results: 0.83 and 0.82 for negative and positive affective states, respectively.

Private Body Consciousness Scale (PBCS)
The 5-item, 5-point Likert-type questionnaire, developed by Miller, Murphy and Buss (1981) measures the individual variations regarding the attention towards inner bodily feelings. The questionnaire was translated to Hungarian by Rózsa and Kő (2008) as part of the Bodily Awareness Questionnaire (Rózsa, Kő, Krekó et al. 2008). The internal consistency of the questionnaire proved to be mediocre (Cronbach’s α = 0.62).

Patient Health Questionnaire Somatic Symptom Severity Scale (PHQ-15)
The PHQ-15 (Kroenke, Spitzer & Williams 2002) measures the prevalence of different somatic symptoms (e.g., headache, stomach-ache, fatigue, sleep disorders, etc.) in the last 4 weeks. The questionnaire is an adequate tool to quantify the tendencies of somatization. While the PHQ-15 is not a diagnostic instrument for measuring somatophorm disorders, it rather captures a broader dimension characterized by a disposition to develop various
physical symptoms unexplained by clear organic alterations. The Hungarian version of the PHQ-15 proved to be a valid instrument in different investigations (Salavecz et al. 2006; Szemerszky, Köteles & Bárdos 2009; Köteles & Bárdos 2009). The internal consistency of the scale in the present study was adequate (Cronbach’s $\alpha = 0.72$).

RESULTS

Item analysis and factor structure

The Hungarian version of the MAAS did not differ significantly from the normal distribution (Kolmogorov–Smirnov $Z = 1.012; p = 0.258$; see Figure 1) and showed a quite good internal consistency (Cronbach’s alpha = 0.78), which cannot be substantially improved by removing any of the items (see Table 1, column 5). Descriptive statistics of the items and the scale are summarized in Table 1.

The expected single factor structure of the scale was checked by confirmatory factor analysis (CFA) using the AMOS program (v4.01). Goodness-of-Fit statistics showed a relatively poor fit between the theoretically expected structure and the empirical data ($\text{CMIN/df} = 4.795; p < 0.001; \text{NFI} = 0.73; \text{IFI} = 0.78; \text{TLI} = 0.74; \text{RMSEA} = 0.086 [0.078–0.094]$). Standardized regression weights are presented in the last column of Table 1. ($p < 0.001$ in all cases except Item No. 5). In the case of the fifth item (“I tend not to notice feelings of physical tension or discomfort until they really grab my attention.”) the standardized regression value was very low and did not reach the significant level.

Correlations with the validating scales

Since all six questionnaires used for validation showed a non-normal distribution, correlations among variables were investigated using a non-parametric method. Kendall’s tau_b coefficients and significance levels are summarized in Table 2. Directions and strengths

![Figure 1. The Hungarian version of the MAAS did not differ significantly from the normal distribution (Kolmogorov–Smirnov $Z = 1.012; p = 0.258$) and showed a quite good internal consistency (Cronbach’s alpha = 0.78)](attachment:figure1.png)
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of inter-correlations among validating questionnaires fitted expectations and data from the literature. MAAS scores showed medium level (0.18–0.19) positive correlations with positive affectivity (PANAS+) and well-being (WB-5) scores, and a bit stronger (0.26–0.33) negative correlations with measures of negative affectivity (PANAS–, STAI-T). MAAS was a negative correlate of body focused attention (PBCS) and of non-specific symptoms (PHQ-15).

Table 1. Descriptive statistics and psychometric properties of the items of the Hungarian version of MAAS

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>Min–max values</th>
<th>Cronbach’s alfa if item deleted</th>
<th>CFA standardized regression weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.71</td>
<td>1.068</td>
<td>1–6</td>
<td>0.785</td>
<td>0.350</td>
</tr>
<tr>
<td>2</td>
<td>4.12</td>
<td>1.332</td>
<td>1–6</td>
<td>0.774</td>
<td>0.386</td>
</tr>
<tr>
<td>3</td>
<td>4.04</td>
<td>1.116</td>
<td>1–6</td>
<td>0.765</td>
<td>0.550</td>
</tr>
<tr>
<td>4</td>
<td>3.25</td>
<td>1.333</td>
<td>1–6</td>
<td>0.782</td>
<td>0.316</td>
</tr>
<tr>
<td>5</td>
<td>2.96</td>
<td>1.136</td>
<td>1–6</td>
<td>0.799</td>
<td>0.006</td>
</tr>
<tr>
<td>6</td>
<td>2.77</td>
<td>1.513</td>
<td>1–6</td>
<td>0.784</td>
<td>0.310</td>
</tr>
<tr>
<td>7</td>
<td>3.89</td>
<td>1.211</td>
<td>1–6</td>
<td>0.763</td>
<td>0.584</td>
</tr>
<tr>
<td>8</td>
<td>3.81</td>
<td>1.151</td>
<td>1–6</td>
<td>0.757</td>
<td>0.648</td>
</tr>
<tr>
<td>9</td>
<td>4.14</td>
<td>1.178</td>
<td>1–6</td>
<td>0.769</td>
<td>0.522</td>
</tr>
<tr>
<td>10</td>
<td>4.35</td>
<td>1.010</td>
<td>1–6</td>
<td>0.764</td>
<td>0.640</td>
</tr>
<tr>
<td>11</td>
<td>3.51</td>
<td>1.127</td>
<td>1–6</td>
<td>0.768</td>
<td>0.511</td>
</tr>
<tr>
<td>12</td>
<td>5.05</td>
<td>1.155</td>
<td>1–6</td>
<td>0.770</td>
<td>0.479</td>
</tr>
<tr>
<td>13</td>
<td>3.42</td>
<td>1.259</td>
<td>1–6</td>
<td>0.774</td>
<td>0.434</td>
</tr>
<tr>
<td>14</td>
<td>4.19</td>
<td>1.076</td>
<td>1–6</td>
<td>0.757</td>
<td>0.684</td>
</tr>
<tr>
<td>15</td>
<td>3.93</td>
<td>1.346</td>
<td>1–6</td>
<td>0.771</td>
<td>0.300</td>
</tr>
<tr>
<td>Total</td>
<td>57.15</td>
<td>9.036</td>
<td>31–84</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Table 2. Correlations among the scales (Kendall’s tau_b coefficients; *: p < 0.05; **: p < 0.01; ***: p < 0.001)

<table>
<thead>
<tr>
<th></th>
<th>MAAS</th>
<th>PANAS+</th>
<th>PANAS–</th>
<th>STAI-T</th>
<th>PBCS</th>
<th>WB-5</th>
<th>PHQ-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAAS</td>
<td>1</td>
<td>0.18***</td>
<td>−0.26***</td>
<td>−0.33***</td>
<td>−0.09**</td>
<td>0.19***</td>
<td>−0.22***</td>
</tr>
<tr>
<td>PANAS+</td>
<td>1</td>
<td>−0.16***</td>
<td>−0.36***</td>
<td>0.02</td>
<td>0.38***</td>
<td>−0.06*</td>
<td></td>
</tr>
<tr>
<td>PANAS–</td>
<td>1</td>
<td>0.48***</td>
<td>0.19***</td>
<td>−0.25***</td>
<td>0.32***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAI-T</td>
<td>1</td>
<td>0.13***</td>
<td>−0.40***</td>
<td>0.31***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBCS</td>
<td>1</td>
<td>0.02</td>
<td>0.22***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WB-5</td>
<td>1</td>
<td>−0.16***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHQ-15</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Regression analysis

Multiple binary logistic regression analysis was used to explore the resultant predictive power of the validating variables. Values of the dependent binary variable were calculated using the first and the fourth quartiles of MAAS scores (0: MAAS < 52, N = 132; 1: MAAS > 62,

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Table 3. Important characteristics of six steps of multiple binary logistic regression analysis (dependent variable: binary form of MAAS scores)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>B</th>
<th>S.E.</th>
<th>Exp(B)</th>
<th>95% C.I. for Exp(B)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>WB-5</td>
<td>0.220</td>
<td>0.046</td>
<td>1.246</td>
<td>1.139 – 1.363</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>WB-5</td>
<td>0.150</td>
<td>0.052</td>
<td>1.162</td>
<td>1.049 – 1.287</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td></td>
<td>PANAS+</td>
<td>0.071</td>
<td>0.027</td>
<td>1.074</td>
<td>1.019 – 1.132</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>WB-5</td>
<td>0.147</td>
<td>0.053</td>
<td>1.158</td>
<td>1.044 – 1.285</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td></td>
<td>PANAS+</td>
<td>0.081</td>
<td>0.027</td>
<td>1.085</td>
<td>1.028 – 1.144</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td></td>
<td>PBCS</td>
<td>−0.105</td>
<td>0.036</td>
<td>0.900</td>
<td>0.838 – 0.966</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td>WB-5</td>
<td>0.100</td>
<td>0.056</td>
<td>1.105</td>
<td>0.991 – 1.233</td>
<td>&gt; 0.1</td>
</tr>
<tr>
<td></td>
<td>PANAS+</td>
<td>0.083</td>
<td>0.028</td>
<td>1.086</td>
<td>1.029 – 1.147</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td></td>
<td>PBCS</td>
<td>−0.065</td>
<td>0.038</td>
<td>0.927</td>
<td>0.869 – 1.010</td>
<td>&gt; 0.1</td>
</tr>
<tr>
<td></td>
<td>PHQ-15</td>
<td>−1.696</td>
<td>0.522</td>
<td>0.183</td>
<td>0.066 – 0.511</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 5</td>
<td>WB-5</td>
<td>0.042</td>
<td>0.059</td>
<td>1.043</td>
<td>0.930 – 1.171</td>
<td>0.472</td>
</tr>
<tr>
<td></td>
<td>PANAS+</td>
<td>0.068</td>
<td>0.028</td>
<td>1.071</td>
<td>1.013 – 1.132</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td></td>
<td>PBCS</td>
<td>−0.030</td>
<td>0.041</td>
<td>0.970</td>
<td>0.896 – 1.051</td>
<td>0.456</td>
</tr>
<tr>
<td></td>
<td>PHQ-15</td>
<td>−0.976</td>
<td>0.532</td>
<td>0.377</td>
<td>0.133 – 1.070</td>
<td>&gt; 0.1</td>
</tr>
<tr>
<td></td>
<td>PANAS−</td>
<td>−0.120</td>
<td>0.027</td>
<td>0.887</td>
<td>0.841 – 0.936</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 6</td>
<td>WB-5</td>
<td>−0.023</td>
<td>0.063</td>
<td>0.977</td>
<td>0.863 – 1.106</td>
<td>0.713</td>
</tr>
<tr>
<td></td>
<td>PANAS+</td>
<td>0.041</td>
<td>0.030</td>
<td>1.042</td>
<td>0.982 – 1.106</td>
<td>0.173</td>
</tr>
<tr>
<td></td>
<td>PBCS</td>
<td>−0.024</td>
<td>0.042</td>
<td>0.976</td>
<td>0.899 – 1.060</td>
<td>0.566</td>
</tr>
<tr>
<td></td>
<td>PHQ-15</td>
<td>−0.473</td>
<td>0.553</td>
<td>0.623</td>
<td>0.211 – 1.843</td>
<td>0.393</td>
</tr>
<tr>
<td></td>
<td>PANAS−</td>
<td>−0.070</td>
<td>0.030</td>
<td>0.933</td>
<td>0.879 – 0.989</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td></td>
<td>STAI-T</td>
<td>−0.094</td>
<td>0.027</td>
<td>0.910</td>
<td>0.863 – 0.960</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>
Measuring mindfulness


Predictor variables were entered into the equation in six steps (see Table 3 for details). MAAS scores were significantly related to negative affectivity (PANAS–) and trait anxiety (STAI-T) scores in the final equation.

DISCUSSION

We examined the psychometric properties of the Hungarian version of the Mindful Attention Awareness Scale (MAAS-H) applying the questionnaire based data of 511 undergraduate university students. Regarding the reliability of the scale, the MAAS-H proved to have good internal consistency, and the items were fit into a single factor structure. We shall note however, that there was only a relatively poor fit between the empirical data and the expected structure. Mindfulness is supposed to involve different factors (Baer et al. 2006) but the MAAS-H cannot measure these facets, only a general, dispositional level of mindfulness. It is possible that mindfulness is a more complex phenomenon that cannot be adequately described by a single-factor questionnaire. We found a very low and non-significant standardized regression value for item 5. This result is quite interesting, since the same item was reported to have the lowest factor loading and item-total correlation in the original scale as well. We hypothesize that the 5th item is different from the other statements, because it is the only item describing a perception of a qualitatively negative state (“feelings of physical tension or discomfort”). Moreover, this single item reflects on a bodily state in contrast to the others describing attention and awareness of present-moment episodes and behaviours.

In order to examine the convergent validity of the MAAS-H, we correlated the scale with different scales known to be related to mindfulness. In coherence with previous studies, mindfulness was a positive correlate of well-being and positive affect, while it negatively correlated with trait anxiety, negative affect, the prevalence of non-specific symptoms and with body focused attention, although this last correlation was very low. Since mindfulness seems to promote emotional regulation the reported relations with the above scales fit into our expectations regarding its convergence validity. The inverse relation between mindfulness and the prevalence of non-specific symptoms – measured by the PHQ-15 – deserves some explanation. Since, the PHQ-15 reflects a sort of mental absorption to negative physical symptoms, related to tendencies of somatization and neuroticism (Kroenke, Spitzer & Williams 2002), less mindful individuals may inadequately perceive and monitor their bodily states. Subjective augmentation and negative emotional interpretation of bodily cues may create a vicious circle of anxious thought processes far from the present moment awareness of mindfulness. It is also possible, that the inverse relation between the prevalence of physical symptoms and mindfulness is the indirect effect of elevated negative affect, since intense emotional reactions may hinder the open, non-judgmental working mode characterized by mindful states. Mindfulness was weakly and negatively related to the levels of Private Body Consciousness (PBCS). This result coheres with Brown & Ryan’s original study (2003) showing that mindfulness is different from other measures of consciousness that involve self-reflective components as well. (For example the Self-Consciousness Scale, Fenigstein et al. 1975) We suggest that while the
PBCS provides a measure of more self-reflective, effortful and controlled attentional focus on bodily states, mindfulness is characterized by a less effortful and pre-reflexive attentional style. According to the results of the hierarchical regression analysis trait anxiety and negative affective states explained more than 30 percent of the variance of the MAAS-H, indicating that mindfulness is strongly related to the emotional balance of the individuals, although the questionnaire aims to capture an information processing style without any explicit allusion to affective functioning. Moreover, this result suggests that negative affect interferes with mindfulness, a phenomenon often described by Buddhist philosophies proposing the dampening of emotional intensity that contributes to an ideal mental state. Recently there is a growing interest regarding the neuropsychological and neural correlates of mindfulness bridging apparent the gap between personality and cognitive psychology (Moore & Malinowsky 2009; Zeidan et al 2010; Creswell et al 2007). Since mindfulness measures a unique property of attention having a strong effect on emotional processing, it is an extremely interesting tool to examine one of the possible backgrounds of individual variations in different neuropsychological functions.

REFERENCES


Measuring mindfulness


**APPENDIX**

**Mindful Attention and Awareness Scale**

**MAAS-H**

(*Mentális Figyelem és Tudatosság Kérdőív*)

A következő állítások a mindennapi élményeivel kapcsolatosak. Használja az alábbi, 1–6-ig terjedő skálát annak elődöntésére, hogy milyen gyakran, vagy ritkán vannak mostanában ilyen élményei. Kérjük, azt a választ jelölje meg, amelyik valójában jellemző Önre, és ne azt, amelyet ideálisnak gondolna! Kérem, hogy minden állítást külön-külön vizsgáljon meg, függetlenül a többitől.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>szinte mindig</td>
<td>nagyon gyakran</td>
<td>elég gyakran</td>
<td>elég ritkán</td>
<td>nagyon ritkán</td>
<td>szinte soha</td>
</tr>
</tbody>
</table>

1. Előfordul, hogy úgy élek át bizonyos érzelmeket, hogy azok csak később tudatosulnak bennem. 1 2 3 4 5 6

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2. Előfordul, hogy figyelmetlenségből, vagy mert épp máshol jár az agyam, eltörök vagy kiöntök valamit.

3. Nehezemre esik a jelen pillanatra koncentrálni.

4. Ha menem kell valahová, igyekszem minél gyorsabban odaérni, anélkül hogy gondosan odafigyelnék az élményekre, amelyek az út során élnek.

5. Igyekszem figyelmen kívül hagyni a testi feszültség, rossz közérzet vagy kényelmetlenség érzését, amíg még nem élég erősek ahhoz, hogy teljesen lekessék a figyelmet.


7. Úgy tűnik, mintha olykor gépiesen viselkednék, anélkül, hogy tudatában lennék annak, mit is csináljak.

8. Folyton „rohanok a teendőim után”, anélkül, hogy valóban odafigyelnék rájuk.

9. Ha valamit el akarok érni, kizárólag a végső célra koncentrálok úgy, hogy néha észre sem veszem, miket is művelek, csak, hogy az adott célt elérjem.

10. Automatikusan végzem el a feladataimat vagy a munkámat, anélkül, hogy valóban odafigyelnék arra, amit csinálom.

11. Előfordul, hogy csak fél füllel figyelek valakire, aki beszél hozzám, miközben valami egész mást csinálok.

12. Előfordul, hogy csak úgy céltalanul bolyongok, vagy vezetem az autóm egyik helyről a másikra, majd azon kapom magam, hogy nem tudom, miért is mentem oda, ahol vagyok.

13. Folyton a múltamon vagy a jövőmön rágódom.


15. Megesik, hogy eszegetek valami rágcsálni valót, és közben alig figyellem arra, hogy eszem.