

Croatian Translation and Validation of the Mind-Wandering Questionnaire (MWQ)

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Abstract

This research aimed to translate and validate the Mind-Wandering Questionnaire (MWQ) to the Croatian language, and to provide preliminary data on its reliability, factor structure and convergent validity in a sample of Croatian students. After translation and adaptation, the Croatian version of the MWQ was administered to 451 eight-grade elementary school students (239 female and 212 male participants). With the MWQ, we administered the Emotional Skills and Competence Questionnaire (ESCCQ-45). Results show high internal consistency of the Croatian translation of the MWQ. Confirmatory factor analysis supports a unidimensional model. Convergent validity was supported by a significant negative correlation between MWQ and Emotional Skills and Competence Questionnaire. We propose further investigation of psychometric properties of the Croatian translation of the MWQ and investigating test-retest reliability as well as discriminant validity of the Questionnaire.

Keywords: mind-wandering, validation, Croatian translation of the MWQ, students

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Introduction

This research aimed to translate and validate the Mind-Wandering Questionnaire (MWQ) to the Croatian language. Mind-wandering is a mental phenomenon in which executive control shifts from the primary task to the processing of personal goals (Smallwood & Schooler, 2006). This particular kind of thoughts can be defined as stimulus-independent and task-unrelated thoughts, in the sense that their content *a*) is not the direct reflection of current sensory input and *b*) is unrelated to the task being performed at the moment of their occurrence (Stawarczyk et al., 2011a, 2011b). It is one of the ubiquitous and pervasive of all the cognitive phenomena (Schooler et al., 2014; Smallwood & Schooler, 2006; Song & Wang, 2012) and occurs during 30 – 50 % of our daily waking state (Kane et al., 2007; Killingsworth & Gilbert, 2010). Mind-wandering is often elicited by external or internal cues rather than emerging out of nowhere (Song & Wang, 2012). The frequency of mind-wandering is influenced by several factors, such as attention orientation, devotion to the task, and mood (Song & Wang, 2012).

Ubiquity, high frequency of appearance and especially the contents of mind-wandering indicate its importance. Most of the thoughts during mind-wandering are self-related (Baird et al., 2011; Smallwood et al., 2011), mainly oriented toward the future (Smallwood et al., 2009) and the upcoming events (Baird et al., 2011; Stawarczyk et al., 2011b). In addition, by keeping the thoughts of the past in our memories, mind-wandering enables us to maintain self-awareness (Tulving, 1987).

Studies also suggest that mind-wandering could enhance creativity. For instance, individuals with Attention-Deficit/Hyperactivity Disorder (ADHD) score higher on measures of creativity (White & Shah, 2006) than individuals without ADHD. Constant attachment to the problem can impede creativity while interruption can increase it (Dijksterhuis & Meurs, 2006). Meta-analysis of the conditions that maximize incubation effects (problem-solving by temporarily giving up), found that the benefits of incubation intervals are greater when individuals are occupied by low cognitive demand task compared to when they engage in either a high-demanding task or no task at all (Sio & Ormerod, 2009).

Unfortunately, mind-wandering is a double-edged sword. Despite its obvious usefulness, it is associated with many difficulties. These include: 1) reduced reading comprehension, (McVay & Kane, 2012; Smallwood et al., 2011); 2) impaired driving (He et al., 2011); 3) having trouble paying attention during lectures (Lindquist & McLean, 2011; Risko et al., 2012) and 4) reduced scores on memory tasks (Smallwood et al., 2003). High levels of mind-wandering are also associated with less life satisfaction (Mar et al., 2012), increased depressive symptomatology (Smallwood et al., 2007; Watts et al., 1988), worse mood, greater stress, lower self-esteem (Mrazek et al., 2013), and more negative thinking (Smallwood et al., 2007). Although the mode of operation is not entirely clear, some mental disciplines,

especially mindfulness meditation, reduce wandering of the mind and its negative consequences (Bakosh et al., 2015; Xu et al., 2014).

In a large online study, conducted among men and women in the general population, aged 16 to 83, with or without ADHD, men without ADHD had higher scores on mind-wandering (Mowlem et al., 2019). At the same time, research of primary school students in the temporal focus during spontaneous mental time travel in daily life, revealed that the average score in the past orientation and future orientation respectively had no main effect of gender or grade (Ye et al., 2014).

There are two categories and four main methods for measuring mind-wandering. The first category is the objective/indirect. It includes measurements of 1) reaction time or 2) eye movements and other physiological measures. The second category includes two subjective/direct methods that use self-caught measures, in which participants report whenever they notice their minds have wandered, and probe-caught measures, in which participants are intermittently probed and asked whether at that particular time they were mind-wandering (Weinstein, 2018).

Among the questionnaires that have been used to assess mind-wandering, the most common are: 1) Daydream Frequency Scale (DDFS), also known as the Daydream Subscale of the Imaginal Process Inventory (Giambra, 1995) that predominantly refers to stimulus-independent thoughts; 2) Attention Related Cognitive Errors Scale (ARCES) (Cheyne et al., 2006) that primarily considers the frequency of everyday mistakes; 3) Mindful Attention and Awareness Scale (MAAS) (Brown & Ryan, 2003) that measures awareness of what is occurring in the present; 4) The Mind Excessively Wandering Scale (MEWS) (Mowlem et al., 2016) that was created primarily to determine the ADHD symptoms; and 5) Mind-Wandering Questionnaire (MWQ) (Mrazek et al., 2013) that measures the frequency of mind-wandering irrespective of whether it is deliberate or spontaneous.

Although the DDFS is widely used as a measure of mind-wandering, this questionnaire is focused more on stimulus-independent thoughts than on task-unrelated thoughts. The key difference between the constructs of daydreaming and mind-wandering relates to the relevance of a primary task from which the attention is diverted. Daydreaming refers to stimulus-independent thought that does not occur during a primary task, while mind-wandering means a shift of attention away from a task (Mrazek et al., 2013). According to the authors, "MWQ is a suitable tool for researchers to use when they are specifically interested in mind-wandering, as opposed to related constructs assessed by the DDFS, ARCES, or MAAS" (Mrazek et al., 2013, p. 5).

Mind-wandering with a consequent lack of attention represents a particular problem when transferring knowledge to students, whether it is during the traditional classroom teaching (Bunce et al., 2010) or online education (Szpunar et al., 2013). The results of previous research suggest a significant correlation of attention regulation difficulties with emotional knowledge. Emotional knowledge comprises many aspects, such as understanding the functions of emotions, emotion activators

as well as the rules for displaying emotions (Izard, 2001). Children who can process noticeable emotional cues in the educational environment are more likely to carry out academic tasks. On the other hand, children whose emotional knowledge is low might have more strained relationships and more unpleasant encounters with their teachers and peers, and, consequently, have problems directing their attention and concentrate on academic tasks (Izard et al., 2001). Furthermore, developmental theory suggests that processes of attention and emotion overlap when it comes to neural circuitry and are interconnected from early childhood onward (Greenberg & Snell, 1997; Kopp, 2002). In other words, children regulate emotions using attention, and the way they experience emotions affects their ability to respond to stimuli. Their attention is often captured by stimuli that evoke emotion, which may affect the children's emotional experience in terms of its type and intensity (Greenberg & Snell, 1997). Moreover, the leading research model for investigating regulation of emotions often uses measuring of attention shift and focus as an indicator of regulation ability (Eisenberg et al., 2001). Therefore, attentional and emotional competence potentially correlate in the academic environment, which is worthy of empirical investigation (Mostow & Fine, 2006). To solve this problem, various practical strategies have been devised: integration of "checkpoint" questions throughout lectures and active learning through demonstrations, discussions, or other activities to allow students to mind-wander when it will not significantly affect learning (Pachai et al., 2016). An additional strategy focuses on interpolating memory tests while viewing on-line lectures (Szapunar et al., 2013).

If we want to explore the impact of these, or some future techniques, on mind-wandering and improving students' abilities, it is essential to have a reliable instrument for measuring the wandering of the mind. As the MWQ is short (contains only 5 items), designed for undergraduate, high-school and middle-school students and directly measures mind-wandering trait levels, we considered it as the most appropriate for translation and adaptation into the Croatian language. Mrazek et al. (2013) reported factorial analyses of the MWQ, proposing a single-factor solution with internal consistency measured by Cronbach Alpha of .85.

Previously, the MWQ was translated and validated in Spain (Salavera et al., 2017), China (Luo et al., 2016) and Japan (Kajimura & Nomura, 2016) and a single-factor solution was confirmed in these studies. As there is no Croatian scale for mind-wandering, translation and validation of the MWQ into the Croatian will enable the study of this phenomenon in the Croatian students. Given the fact that previous research has shown a significant correlation between emotional competence and attention processes in children, which underlies the process of mind-wandering (Mostow & Fine, 2006), we decided to examine the association of emotional competence with mind-wandering to determine convergent validity.

Method

Participants and Procedure

In our study, participants were eight-grade elementary school students. Students were recruited from 20 elementary schools in the city of Osijek. Before starting the study, we contacted the Administrative Department for Social Affairs of the City of Osijek to inform them of our research and to obtain permission to conduct the research. After obtaining the permission, the city authorities informed all of the 20 elementary school principals about our research and asked them to help us with the testing of children. In the next step, we visited the schools and verbally informed each principal, pedagogue and psychologist at the school, and provided them with forms for informed parental consent and tests for children. After obtaining the signed consent forms from the parents, the children were tested. The study was conducted between April and May 2019. The Emotional Skills and Competence Questionnaire (ESCQ-45; Takšić, 1998) was administered with the MWQ. Out of the 869 students in all of the 20 elementary schools in Osijek, 451 (239 female and 212 male) completed the questionnaire, representing a response rate of 52 %. The average student age was 14.2 ($SD = 0.45$; range from 13 to 16, $Mdn = 14$). The study was conducted with the full cooperation of the parents of the students who participated in the study, with their appropriate understanding of the implementation of the research, and has therefore been performed in accordance with the ethical standards laid down in the Declaration of Helsinki (1964).

Measures

The Mind-Wandering Questionnaire is a five-item, self-assessing questionnaire, which rates trait levels of mind-wandering (Mrazek et al., 2013). Items are rated on a 6-point scale ranged from 1 (*Almost never*) to 6 (*Almost always*). Items include statements such as “*I have difficulty maintaining focus on simple or repetitive work*” and “*While reading, I find I have not been thinking about the text and must therefore read it again*”. The total score for the mind-wandering questionnaire for all five items can range from 5 to 30. After obtaining permission to use the Mind-Wandering Questionnaire from the author of the original questionnaire, we had the questionnaire translated into Croatian by three bilingual experts using the back-translation method. The initial translation of the MWQ from English to Croatian was performed independently by three translators whose mother tongue was Croatian. In the next step, the translations were compared and all the different translation options were discussed. As a result, the researchers constructed a unique version containing the items for which they all agreed they represent the best semantic and conceptual translation of the original items, as well the best one in terms of clarity, common language, and cultural adequacy. The final Croatian version of translation was then translated from Croatian into English (back-translation) by one

researcher with proficiency in both English language and mind-wandering research. In this study, the Cronbach's alpha for the whole questionnaire was .82.

Emotional competence was measured by the *Emotional Skills and Competence Questionnaire*, ESCQ-45 (Takšić, 1998). The term "emotional competence" was chosen because it equally emphasizes the importance of emotional competence in person's daily adjustment, but also because of the prevailing view that only intelligence can be measured by the aptitude tests. It is constructed according to the emotional intelligence model of Mayer and Salovey, which differs between the perception and expression of emotions, and which is presented in separate dimensions. The questionnaire is intended to assess emotional competence, the process of recognizing one's own and others' emotional states in order to solve problems more effectively and regulate behaviour more appropriately. It consists of 45 items arranged in three subscales: Perceiving and understanding emotions, Expressing and labelling emotions, and Managing and regulating emotions.

The subjects respond to each of the statements by a degree of agreement on a 5-point scale, from 1 (*Not at all*) to 5 (*Entirely yes*), and the corresponding points are summed within the scales. The psychometric characteristics of the ESCQ-45 are generally good, so the reliability of the whole questionnaire in different samples is from .88 to .92 (Takšić & Smojver-Ažić, 2016). In this study, the Cronbach's alpha for the whole questionnaire was .90.

Correlation between individual subscales ranges from .35 to .51, so the overall score can be formed as a measure of general emotional competence, with reliability between .87 and .92. (Takšić et al., 2006). In this study, the correlations between individual subscales range from .43 to .48, which justifies the use of the total score as a measure of emotional competence.

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) for Windows, version 21 (IBM Corp., 2012). All the tests were two-tailed and conducted at the 5 % level of statistical significance. Pearson's correlation coefficient was used to calculate the correlations between the Croatian translation of the MWQ and the Emotional Skills and Competence Questionnaire.

We conducted the confirmatory factor analysis (CFA) by Mplus 7.1 to examine the unidimensional factor structure of the questionnaire with the weighted least square mean and variance adjusted (WLSMV) method for ordinal indicators. As model fit indices, we used: (a) WLSMV chi-square (χ^2) (Muthén & Muthén, 2012), and the ratio of chi-square and degrees of freedom (χ^2/df), where the ratio between 2 and 5 indicate a good model fit (Marsh & Hocevar, 1985); (b) the root mean squared error of approximation (RMSEA; Steiger, 2000), where values of $< .05$ were taken as a good fit, and $.05 - .08$ as a moderate fit; (c) the comparative fit index (CFI) where values of $.90$ were taken as an adequate fit, $.90 - .95$ as a moderate fit and below $.95$

as a perfect fit (Hu & Bentler, 1999) and standardized root mean square residual (SRMR) with $< .08$ indicated a good fit (Steiger, 2000).

Omega reliability coefficient was calculated using the JASP program (Version 0.12; JASP Team, 2020).

Results

Descriptive Statistics

Mean result on the Croatian version of the MWQ was 17.80 ($SD = 5.26$). Modal value was 15, with 37 participants achieving this result. Distribution doesn't differ from normal with Skewness = .05 ($S.E. = 0.11$) and Kurtosis = $-.65$ ($S.E. = 0.23$). According to Field (2005), asymmetry index and curvature coefficient should be equal to or close to zero to confirm normal distribution. Although the above results differ from zero, the results can be viewed as acceptable, since Kline (2011) states that the criteria for normal distribution are absolute values of asymmetry and curvature. The absolute value of asymmetry should be less than 3 and the absolute value of curvature less than 8. Since the above results correspond to that, the implementation of parametric procedures can be continued.

Internal consistency was measured with Cronbach's Alpha and it was .82 with all 5 items. Mean inter-item correlation was .48. (Table 1).

The mean result on the Emotional Skills and Competence Questionnaire was $M = 157.42$, $SD = 19.22$. Distribution does not differ from normal with Skewness = $-.33$ ($S.E. = .11$) and Kurtosis = .09 ($S.E. = .23$). Internal consistency was measured with Cronbach's Alpha and it was .90. Mean inter-item correlation was .28 with minimum value .32 and maximum .64.

Table 1

Descriptive Statistics and Reliability for MWQ and ESCQ-45

	MWQ	ESCQ-45
<i>M</i>	17.80	157.42
<i>SD</i>	5.26	19.22
Median	18	159
Mode	15	169
Min-max	5-30	90-207
Skewnes	0.05	-0.33
Std. Error of Skewnes	0.11	0.11
Kurtosis	-0.65	0.09
Std. Error of Kurtosis	0.23	0.23
Mean inter-item correlation	.48	.28
Cronbach α	.82	.90

Note. MWQ – Mind-Wandering Questionnaire; ESCQ-45 – Emotional Skills and Competence Questionnaire.

Factorial Analysis of the Croatian Translation of the MWQ

The CFA confirmed the unidimensional factor structure of the questionnaire since all goodness of fit indices were above critical values ($\chi^2(4) = 11.22$, $df = 4$; $p = .024$; $\chi^2/df = 2.80$; CFI = .991; RMSEA = .063 (90 % confidence interval .021 - .109). and SRMR = .023. Also, all the items significantly loaded the factor, with factor loadings ranging from .47 to .84. (Table 2). We also calculated the omega reliability coefficient, which is .83.

Table 2

Factor Loadings of the Confirmatory Factor Analysis (CFA) of the Unidimensional Model of the MWQ

Items	F
1. I have difficulty maintaining focus on simple or repetitive work. [Teško se koncentriram na jednostavne ili jednolične zadatke.]	.47
2. While reading, I find I haven't been thinking about the text and must therefore read it again. [Tijekom čitanja događa se da ne razmišljam o tekstu te ga stoga moram ponovno pročitati.]	.66
3. I do things without paying full attention. [Nisam u potpunosti usredotočen/a na ono što radim.]	.70
4. I find myself listening with one ear, thinking about something else at the same time. [Događa mi se da slušam jednim uhom, a istovremeno razmišljam o nečemu posve drugom.]	.84
5. I mind-wander during lectures or presentations. [Misli mi lutaju tijekom predavanja ili prezentacija.]	.73

Correlations between MWQ and ESCQ-45

To analyze the convergent validity of the MWQ, we calculated the correlation between the MWQ and self-reported measure of emotional competence (ESCQ-45). Since distribution of the MWQ and emotional competence scores did not differ from normal, we proceeded with parametric correlation analysis. Pearson's correlation coefficient between the MWQ and emotional competence was $r = -.28$, $p = .000$, pointing to a weak but significant negative relation between these variables.

Discussion

The purpose of this study was to adapt a Croatian version of the MWQ (Mrazek et al., 2013), which would allow comparability with the results from other countries. Furthermore, it would provide researchers in Croatia with a mind-wandering

measure for adolescents with or without specific disorders, such as attention deficit disorder, specific learning difficulties etc. This measure would be useful in school practice, as well as for scientific purposes. Our results revealed that the Croatian version of MWQ for adolescents evidences high construct validity and reliability.

Reliability and Factor Structure of the Croatian Translation of the MWQ

As for internal consistency of the Croatian version of the MWQ, Chronbach's Alpha was .82 among the 5 items, which points to good reliability. To further test the internal consistency, we next examined the inter-item correlations. The results showed positive and significant results among items of the MWQ, with values similar to those obtained by Mrazek (Mrazek et al., 2013). Consistently moderate inter-item correlations are preferred, as they show good internal reliability without highly redundant (expendable) items (Clark & Watson, 1995). According to these criteria, the MWQ had moderate inter-item correlations.

The factorial structure of the MWQ was analyzed by a confirmatory factorial analysis. The results of the confirmatory factorial analysis indicated that the model is fitted to the data, which confirmed the one scale's dimensional structure and corresponded with both the initial questionnaire postulates (Mrazek et al., 2013) and the factorial structure seen in the original questionnaire version, as well as in the results of confirmatory factorial analysis of the questionnaire in Spanish, Chinese and Japanese (Luo et al., 2016; Kajimura & Nomura, 2016; Salavera et al., 2017). Our results point to the appropriateness of using the Croatian translation of MWQ with adolescents.

Convergent Validity

Convergent validity of the Croatian translation of the MWQ was evaluated by investigating correlations with the self-reported measure of emotional competence (measured by the Emotional Skills and Competence Questionnaire; Takšić, 1998). To the best of our knowledge, ESCQ was not used previously to test the convergent validity of MWQ. Whereas previous research has shown a significant correlation between emotional competence and attention processes in children, which underlie the process of mind-wandering (Mostow & Fine, 2006), we decided to use emotional competence to test convergent validity.

In our research, we found a weak but significant negative relation between MWQ and emotional competence, supporting the convergent validity of the Croatian translation of the MWQ. Such data are consistent with developmental theories and research that suggest that attention and emotional processes have overlapping neural activities (Greenberg & Snell, 1997; Kopp, 2002).

Limitations of the Study

This study should be evaluated with certain important limitations in mind. All the participants in the study are elementary school students, due to which the findings of the study may not be generalizable for adults. We did not investigate whether there are gender differences, what their impact is on mind-wandering, and what effect gender has on mind-wandering. To determine the impact of gender on mind-wandering we believe we should use a sample of children in the lower and upper grades of primary school as well as children in rural and urban areas. In future studies we should also make an in-depth examination of how can mind-wandering influence performance and different subjective well-being components (subjective happiness, self-esteem, satisfaction with life), like in other studies (Kajimura & Nomura, 2016; Luo et al., 2016; Salavera et al., 2017). In addition, since numerous research opportunities are opening up in this area, we plan to include covariates in our future work, such as gender, age, place of residence etc.

Conclusion

This paper presents the Croatian version of the Mind-Wandering questionnaire. Our data point to good reliability of the Croatian translation of the MWQ based on the internal consistency coefficient. Furthermore, the result of the CFA indicated that unidimensional structure fitted the data well and corresponded with both the initial questionnaire postulates and the factorial structure seen in the original questionnaire version. Convergent validity was supported by a significant negative correlation between the MWQ and emotional competence. In addition, this questionnaire could be useful for indirect measurement of the effectiveness of interventions such as mindfulness-based program and mindfulness-based cognitive therapy, adapted for children, which reduce MW helping the adolescent to improve academic performance.

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Prijevod i validacija Upitnika lutanja uma (MWQ)

Sažetak

Cilj je ovoga istraživanja bio prijevod i validacija Upitnika lutanja uma (engl. *Mind Wandering Questionnaire*, MWQ) na hrvatski jezik te predstavljanje preliminarnih podataka o njegovoj pouzdanosti, strukturi i konvergentnoj valjanosti na uzorku hrvatskih učenika. Nakon prevođenja i prilagodbe hrvatski je prijevod MWQ-a primijenjen na 451 učeniku osmih razreda osnovne škole (239 djevojčica i 212 dječaka). Usporedno s MWQ-om primijenjen je i Upitnik emocionalne kompetentnosti (ESCQ-45). Rezultati pokazuju visoku pouzdanost hrvatskoga prijevoda MWQ-a, dok je konfirmatornom faktorskom analizom potvrđen jednodimenzionalni model. Značajna negativna korelacija MWQ-a i Upitnika emocionalne kompetentnosti upućuje na dobru konvergentnu valjanost hrvatskoga prijevoda upitnika. Daljnjim istraživanjima potrebno je dodatno provjeriti psihometrijska svojstva hrvatskoga prijevoda MWQ-a, posebno test-retest pouzdanost te diskriminantnu valjanost upitnika.

Cljučne riječi: lutanje uma, validacija, hrvatski prijevod MWQ-a, učenici

Primljeno: 12. 2. 2020.

Appendix 1

Mind-Wandering Questionnaire (Mrazek et al., 2013)

Upitnik lutanja uma

Croatian translation

1. Teško se koncentriram na jednostavne ili jednolične zadatke.
2. Tijekom čitanja događa se da ne razmišljam o tekstu te ga stoga moram ponovno pročitati.
3. Nisam u potpunosti usredotočen/a na ono što radim.
4. Događa mi se da slušam jednim uhom, a istovremeno razmišljam o nečemu posve drugom.
5. Misli mi lutaju tijekom predavanja ili prezentacija.

