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Replicability of the psychometric properties of trait-levels measures of spontaneous and deliberate mind wandering

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Abstract

Recent research on individual differences in mind wandering have shown that two different forms, spontaneous and deliberate, can be distinguished and measured with the Mind Wandering-Spontaneous (MW-S) and the Mind Wandering-Deliberate (MW-D) scales. In this study we tested whether the psychometric properties of Italian versions of these scales replicated across two common administration methods (paper-and-pencil and online survey). We also investigated their construct validity with respect to other self-report measures of MW and daydreaming, and measures of attentional control (AC). These measures were completed by 123 psychology students using the paper-and-pencil versions and by 165 online participants. The factor structure of the MW scales and their correlations with the other measures were replicated almost perfectly across administration methods. A confirmatory factor analysis performed on data from 270 community participants further supported the replicability of the factor structure of the MW and AC scales. Albeit moderately correlated, the MW-S and the MW-D scales showed discriminant validity, since the former had significantly higher correlations with the other MW and AC measures, but not with daydreaming. These findings further supported the distinctiveness of the two forms of MW and suggested that in correlational studies the administration method is unlikely to affect results.

Introduction

While reading a book, attending a lecture or driving, there may be moments when our attention drifts away from the primary task and the external environment towards private mental contents, unrelated to the ongoing task. This shift in the contents of thought is usually referred to as mind wandering (hereafter MW) (Smallwood & Schooler, 2015). Although MW is a ubiquitous and pervasive mental activity, a number of studies reported high inter-individual variability in the frequency of MW (for a review, see Smallwood & Schooler, 2015). The stability of these differences over time and across different contexts (i.e. in the laboratory and in everyday life, Ottaviani & Couyoumdjian, 2013), suggests that MW is a relatively stable characteristic of the individuals.

Up until recently, MW has been considered as a unitary and homogeneous class of experiences (but see Giambra, 1995, for a different approach) and the most commonly used questionnaires to assess individual differences in trait-level MW (i.e. *Daydreaming Frequency Scale of the Imaginal Process Inventory*, DDFS, Giambra, 1993, derived from Singer & Antrobus, 1970; *Mind Wandering Questionnaire,* MWQ, Mrazek, Phillips, Franklin, Broadway, & Schooler, 2013) were designed to provide a global assessment of MW.

However, an increasing number of studies has shown that MW is indeed a heterogeneous phenomenon that includes multiple types of experiences with distinct characteristics with respect to their content, consequences, and correlates (see, for a discussion, Smallwood & Andrews-Hanna, 2013). Of particular interest, studies on individual differences in MW demonstrated the importance of distinguishing between spontaneous (without intention) and deliberate (with intention) MW (Carriere, Seli, & Smilek, 2013; Giambra, 1989; Seli, Carriere & Smilek, 2015a; Seli, Cheyne, Xu, Purdon, & Smilek, 2015b; Seli, Smallwood, Cheyne, & Smilek 2015c; Shaw & Giambra, 1993). In spontaneous MW, task-unrelated thoughts capture attention, triggering an uncontrolled shift from the task at hand to other trains of thoughts, whereas in deliberate MW attention is intentionally shifted from the focal task toward internal thoughts. Recently, Carriere et al. (2013) developed and validated two self-report scales assessing individual differences in trait-levels of spontaneous and deliberate MW, the Mind Wandering-Spontaneous (MW-S) and the Mind Wandering-Deliberate (MW-D) scales, respectively. Although the MW-S and the MW-D scales were positively correlated (*r*s ranging from .30s to .50s in Carriere et al., 2013), they nonetheless showed discriminant validity. For example, Carriere et al (2013) found that individual differences in spontaneous, but not deliberate, MW were uniquely and positively associated with self-reported fidgeting and self-reported propensity to act mindlessly. Moreover, the MW-S scale was moderately associated with attentional distraction (as measured by the Attentional Control-Distraction scale) and difficulties with attentional shifting (as measured by the Attentional Control-Shifting scale), whereas only small correlations with the same measures were found for the MW-D scale. Subsequent studies provided further evidence that high trait-level tendency to spontaneous MW may reflect difficulties in controlled processing: spontaneous but not deliberate MW was associated with attention-deficit/hyperactivity disorder (ADHD) symptomatology (Seli et al., 2015c) and with higher reports of obsessive–compulsive disorder (OCD) symptoms (Seli, Risko, Purdon, & Smilek, 2017).

Published studies on individual differences in spontaneous and deliberate MW enrolled either undergraduate psychology students or paid online participants recruited through Amazon mechanical Turk (MTurk)[1]. Carriere et al. (2013) reported that the pattern of results on their students, with a few relatively minor exceptions, were very similar, though with attenuated correlations, to that obtained on general population samples. A number of studies have shown that the psychometric equivalence (e.g. reliability, factor structure, and construct validity) between paper-and-pencil and online version of the same instrument must be demonstrated rather than assumed (e.g., Buchanan et al. 2005). Moreover, unless one is able to randomly assign participants, differences in administration methods often imply differences in the age and education of the samples being tested (e.g., Crump, McDonnell, & Gureckis, 2013). However, to the best of our knowledge, no formal test of the replicability of the psychometric properties of the MW-S and MW-D scales across different administration methods (and different samples) has been performed, yet.

In the present study we thus aimed to investigate whether the factor structure and the construct validity of the MW-S and of the MW-D scales replicated across two different administration methods: paper-and-pencil in a sample of undergraduate psychology students, and online survey in a sample of internet users. Since we performed the study on Italian participants, we developed Italian versions of the MW-S and the MW-D and tested their psychometric properties.

In order to assess the construct validity of the MW-S and the MW-D scales, we administered the Attentional Control-Distraction (AC-D) scale and the Attentional Control-Shifting (AC-S) scale (as in Carriere et al., 2013), and the two most commonly used global measures of MW, the DDFS and the MWQ. To the best of our knowledge, no studies have yet investigated the discriminant validity of the MW-D and MW-S scales with respect to more global measures of MW. In their validation paper, Mrazek et al (2013) claimed that the MWQ was "intended to measure the frequency of mind-wandering, irrespective of whether mind-wandering is deliberate or spontaneous" (Mrazek et al., 2013, p. 2) but no empirical support has been provided for this claim.

Method

Participants

The Italian versions of the measures were administered to two independent samples, with a different method of administration but identical in every other detail: paper and pencil

(P&P) and online (WEB). The P&P sample comprised 123 Italian native speakers (females 72%, mean age 21.28±2.47, range 18-29) recruited among undergraduates of Psychology (University of Florence). The participants completed a P&P version of the instruments during classes, in the presence of a research assistant. The WEB sample included 165 Italian speakers (females 72%, mean age 26.26±6.01, range 18-43) recruited opportunistically from the general population using a snowball system. Initially, a starter sample of participants was recruited through authors' and their assistants' e-mail and social network contacts. The contacts received an e-mail or message invitation that included a short description of the study, the link to the website, and the request to forward the link to their e-mail and social network contacts. A third, replication sample of 270 community participants (females 57%, mean age 35.97±14.33, range 18-69) completed the P&P version of the mind wandering and attention control scales (see Measures). This group was obtained by inviting undergraduate psychology students to get a friend or relative to participate in an investigation on personality traits related to cognitive functioning as part of a laboratory activity.

Measures

Translation of the questionnaires

All the measures were first translated into Italian through a forward- and back-translation procedure (Behling & Law 2000). For more details, see Section 1 of the Electronic Supplementary Material (ESM). After the final version of the items was drafted, the newly developed Italian version was administered to ten naïve individuals in order to check for comprehension and readability of items, which were found to be easy to understand and score. The Italian versions of the MW-S and the MW-S can be found in the Appendix, while those of the other measures are reported in Section 1 of the ESM.

Mind Wandering: Spontaneous (MW-S) scale and *Mind Wandering: Deliberate (MW-D) scale* (Carriere et al., 2013). The MW-S and the MW-D are 4-item scales purported to measure spontaneous and deliberate MW, respectively. The MW-D is scored using a 7-point Likert-type scale ranging from "*rarely*" (1) to "*a lot*" (7) for items 1, 2, and 4, and ranging from "*not at all true*"(1) to "*very true*" (7) for Item 3. The MW-S is also scored using a 7-point Likert-type scale ranging from "*rarely*" (1) to "*a lot*" (7) for items 1, 2, and 4, and ranging from "*almost never*" (1) to "*almost always*" (7) for Item 3. In either case, participants are asked to select the answer that most accurately reflects their everyday MW, and higher scores indicate greater tendency to spontaneously and deliberately engage in MW. In the original validation study (Carriere et al., 2013), good internal consistency for both scales was found (Cronbach's αs ranging from .83 to .88 for MW-S and from .84 to .90 for MW-D).

Attentional Control: Distraction (AC-D) scale and Attentional Control: Shifting (AC-S) scale (Carriere et al., 2013). The AC-D and the AC-S are 4-item scales, derived from the Attentional Control Scale (Derryberry & Reed, 2002), to index attentional distraction and difficulties with attentional shifting, respectively. For both scales, items are scored on a 5-point Likert-type scale ranging from "*almost never*" (1) to "*always*" (5), and higher scores reflect higher levels of distraction and difficulties with attentional shifting, respectively. In the original validation study (Carriere et al., 2013), adequate internal consistency for both scales was found (Cronbach's αs ranging from .77 to .81 for AC-D and from .69 to .82 for AC-S).

Mind-Wandering Questionnaire (MWQ, Mrazek et al., 2013). The MWQ is a 5-item measure of trait levels of MW. Items are scored on a 6-point Likert-type scale ranging from "*almost never*" (1) to "*almost always*" (6). The mean value is considered to be an index of the propensity to MW, and higher scores indicate higher frequency of MW. In the validation paper by Mrazek et al (2013) the MWQ showed high internal consistency (α = .85) and the scale’s scores were found to predict MW assessed via thought sampling during a task.

Daydreaming Frequency Scale (DDFS, Giambra, 1993). The DDFS is one of the 28 scales composing the *Imaginal Process Inventory* (Singer & Antrobus, 1970). The DDFS is a 12-item measure of the frequency of daydreaming in everyday life. All items are scored on a 5-point rating scale. Although the items mainly refer to stimulus independent thought that does not occur during a competing task, scores at this scale have been used in several studies as a measure of MW (see, e.g., Forster & Lavie, 2014; Mrazek, Smallwood, & Schooler, 2012; Stawarczyk, Majerus, Catale & D'Argembeau, 2014) and they were found to correlate with task-unrelated thoughts (Mrazek et al., 2012). Giambra (1993) reported high internal consistency (α = .91) and test-retest reliability (r_{tt} = .76 for an interval of one year or less) of the DDFS.

Procedure

Within all samples, the instruments were administered in a counterbalanced fashion to control for the effects of order and sequence. All participants volunteered to participate after being presented with a detailed description of the procedure, and all were treated in accordance with the *Ethical Principles of Psychologists and Code of Conduct* (American Psychological Association, 2010). In order to be included in the study, participants had to report to be at least 18 years old. They did not receive any compensation for their participation.

Results

Factor structure and item analysis of MW measures

Following the original Carriere et al.'s (2013, Study 4) validation study, we carried out factor analyses using the MW-D, MW-S, AC-D, and AC-S items. This analysis allowed us to examine whether the expected four-factor design was maintained and the scales actually measured distinct constructs. The sample sizes of the P&P and of the WEB sample did not afford sufficient statistical power to carry out a confirmatory factor analysis (CFA), but, according to de Winter, Doudou & Wieringa (2009, p. 155), they were adequate for exploratory factor analysis using principal axis factoring (PAF). In order to determine the optimal number of factors we evaluated the scree-plot, performed parallel analysis (Horn, 1965) and computed the minimum average partial correlation (MAP) statistic (Velicer, 1976). In either sample, all these analyses suggested that the optimal number of factors was four. The eigenvalues began to level off at the fourth factor (first ten observed eigenvalues for the P&P sample: 4.08-2.86-2.19-1.42-0.82-0.73-0.62-0.57-0.49-0.44; first ten observed eigenvalues for the WEB sample: 4.55-2.70-1.58-1.50-0.81-0.72-0.65-0.56-0.54-0.52), only the first four observed eigenvalues were higher than the 95th percentile of the 1,000 random-generated ones (first ten random-generated eigenvalues for the P&P sample: 1.82-1.63-1.50-1.38-1.29-1.21-1.13-1.05-0.98-0.92; first ten random-generated eigenvalues for the WEB sample: 1.70-1.53-1.43-1.33-1.25-1.18-1.11-1.05-0.99-0.94), and the MAP reached its minimum at the fourth factor (MAP values for the P&P sample: .063-.053-.038-.035-.041-.050-.067-.080; MAP values for the WEB sample: .051-.042-.039-.032-.039-.050-.069-.087).

We thus performed EFAs using PAF as a method of extraction and setting to four the number of factors to extract in all cases. Similarly to Carriere et al. (2013), we used a varimax rotation, which allowed us to compare the results of the studies of the original and the Italian version of the scales. The four-factor solution explained 66% and 65% of the total variance for the P&P and the WEB sample, respectively. As reported in Table 1, the pattern of factor loadings revealed an adequate separation of the items into their original measures, as all items had their primary loading on the expected factor.

[Table 1]

Although some items had cross-loadings higher than |.30|, these were always substantially smaller ($\Delta\lambda > .10$) than the corresponding primary loadings, consistent with the Carriere et al.'s (2013) findings.

In order to evaluate factor similarity across administration methods, we computed congruence coefficients (CCs, Tucker, 1951). CCs are a measure of factor similarity advised when data do not meet the requirements of CFA (Lorenzo-Seva & ten Berge, 2006). CCs can be interpreted as a standardized measure of proportionality of elements in factor loading matrices of different samples, and they measure factor similarity independently of the mean absolute size of the loadings. Lorenzo-Seva and ten Berge (2006) report that CC values in the .85-.94 range can be interpreted as indicative of *fair* similarity, and values higher than .95 can be interpreted as indicative of *good* similarity, and thus substantial equality of factor loading matrices. Note that in this case they also allowed to adequately take into account the complex pattern of primary and cross-loadings yielded by the EFAs. CCs for MW-D, MW-S, AC-D, and AC-S were .96, .94, .95, and .97, respectively, We also computed CCs to assess the factor similarity of our Italian versions with the original Canadian ones, using the loadings reported by Carriere et al. (2013, p. 27, Table 11). Again, results showed a fair to good degree of similarity (.98, .89, .95, and .96 for the P&P sample; .95, .89, .94, and .93 for the WEB sample).

In order to test the replicability of the four-factor model on an independent sample, we performed a CFA using the data of the community sample. This analysis was performed with Mplus 7 (Muthén & Muthén, 1998–2012). In order to take into account the ordinal nature of the item scores (see, e.g., Finney, & DiStefano, 2006), we used the Weighted Least Squares Mean and Variance Corrected (WLSMV) estimator. The goodness of fit of the CFA models was evaluated considering the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root-mean-square error of approximation (RMSEA). Following Marsh, Hau, and Wen (2004), we considered values $\geq .90$ as acceptable and $\geq .95$ as optimal for TLI and CFI, and values $\leq .08$ as acceptable and $\leq .06$ as optimal for RMSEA. The four-correlated-factor model showed an acceptable fit ($\chi^2(98) = 294.23$, $p < .001$, CFI = .963, TLI = .955, RMSEA = .075), while more parsimonious, alternative models had a substantially worse fit (1-factor model: $\chi^2(104) = 1650.81$, $p < .001$, CFI = .709, TLI = .664, RMSEA = .235; four-uncorrelated-factor model: $\chi^2(104) = 1542.28$, $p < .001$, CFI = .729, TLI = .687, RMSEA = .226). Parameter estimates for the four-correlated-factor model are reported in Table 1 and were all statistically significant.

Cronbach's alphas and results from item analyses for the MW-S and the MW-D are reported in Table 2.

[Table 2]

Considering that alpha is affected by the number of scale items (Green, Lissitz, & Mulaik, 1977) and that MW-S and MW-D comprise only four items, the internal consistency of the scales can be considered as adequate, as it always exceeded .73. Item analyses also showed that inter-item correlations were in the .40-.60 range recommended for (relatively) narrow constructs (Clark & Watson, 1995), corrected-item total correlations were well above .30 and squared multiple correlations always exceeded 10% of shared variance of each item with the others (Table 2). This pattern of results indicates that the two scales have adequate internal consistency and that results replicate well across administration methods. Although not a main focus of this investigation, we found similar results for all the other measures employed in this study (Section 2 of the ESM).

Construct validity of the MW measures

Table 3 reports correlations and descriptive statistics of the measures employed in this study in the P&P and WEB samples.

[Table 3]

We first compared whether each correlation coefficient differed across administration methods. Although some comparisons were statistically significant (e.g., the correlation of AC-S with AC-D), none was any longer significant after a Benjamini and Hochberg's (2000) correction for false discovery rate, and effect sizes of these comparisons were at best small (i.e., in the .10s, using the *r* metric; for details see Section 3 of the ESM). This result suggests that the pattern of correlation among MW measures is fairly similar in the two samples.

We then performed Z-contrast tests (Westen & Rosenthal, 2003) to evaluate the construct validity of the MW-S and the MW-D. Specifically, we wanted to test the discriminant validity of the two measures, namely, whether their correlations with the other measures were statistically different. Results are reported in Table 4 and show that the correlations of the MW-S with the MWQ, the AC-S and the AC-D are higher than those of the MW-D, and that this result replicates across administration methods. The correlations of the MW-S and MW-D with the DDFS did not statistically differ, and, again, this result was similar in the two samples.

[Table 4]

Discussion

The major aim of the present study was to investigate whether the factor structure and the construct validity of two measures of mind wandering, the Mind Wandering-Spontaneous (MW-S) and the Mind Wandering-Deliberate (MW-D) scales, replicated across different administration methods. Specifically, we investigated the replicability across the two most widely used methods for collecting data, that is, paper-and-pencil administration to undergraduate psychology students during classes, and online survey to which internet users were asked to participate. We also examined the discriminant validity of the MW-D and the MW-S scales with respect to measures of attentional control and to the most commonly used global measures of day-dreaming/MW. Since the study was performed on Italian participants, this offered the opportunity to adapt into Italian these and the other scales employed in this study, and test their psychometric properties.

The results showed that the psychometric properties of the Italian version of the MW-S and the MW-D replicated almost perfectly across administration methods. Both EFA and CFA suggested that the items reflected distinct, albeit correlated, constructs, and CCs indicated a substantial equality of their factor loading matrices and an overlap with the results obtained by Carriere et al. (2013) in their original study. Further evidence of the discriminant validity of the scales was provided by their pattern of correlation with the other measures of MW, which also substantially replicated across administration methods. The MW-S showed significantly higher correlations than the MW-D with the MWQ, the AC-D, and the AC-S. However, the scores on the two scales were similarly associated with the scores on the DDFS.

In the study by Carriere et al. (2013), the two measures of attentional control were systematically more associated to spontaneous MW than to deliberate MW (see their Table 2, 3, and 4). Our results were consistent with these findings, although the correlations of MW-S with AC-D and AC-S reported here are weaker (*r*s < .30) than in the original study (*r*s in the .40s; Carriere et al., 2013). These results are in line with previous findings showing that MW cannot be entirely reduced to attentional failures (Stawarczyk et al., 2014) and they call into question the view of MW as a temporary breakdown in attentional control processes (control failure theory, McVay & Kane, 2010).

Interestingly, we found a similar pattern of association of the MW-S and the MW-D with the DDFS, a self-report questionnaire widely used to assess the occurrence of daydreaming in daily life. In DDFS participants are asked to focus on daydreaming "which involves thought unrelated to a task you are working on or else thoughts that continue while you are getting ready for sleep or on a long bus or train ride" (Giambra, 1993, p. 489). Task-unrelated thoughts may come to mind spontaneously and attract our attention, or we may deliberately shift our attention away from the task towards internal thoughts. Possibly due to their apparent ambiguity, the DDFS items might be unpredictably interpreted in terms of spontaneous or deliberate MW, hence the similar correlation with the MW-S and the MW-D[2].

Critically, a different pattern was found with the MWQ (Mrazek et al., 2013), a questionnaire intended to measure trait-levels of the frequency of MW, irrespective of whether MW is spontaneous or deliberate. However, in our study we observed that in both samples the correlations of the MWQ with the MW-S were statistically higher than those with the MW-D, suggesting that MWQ may be a measure of spontaneous, but not deliberate, MW.

Some limitations of the study should be considered when interpreting the results. First, since CCs are unable to detect factor structure invariance beyond the equivalence of factor loadings (Dolan, Oort, Stoel, & Wicherts, 2009), a more accurate test of the replicability of the factor structure across administration methods would have been afforded by a measurement invariance approach through CFA. Unfortunately, the sample sizes in this study did not provide enough statistical power. However, CCs suggested that at least configural invariance was warranted not only across administration methods in this study, but also across Italian and Canadian samples. It could also be argued that the two samples could not be meaningfully compared given the lack of random assignment to administration methods. This is true if one wants to compare mean scores and ascribe differences to the administration method, but this was not the case. We were interested in using two very common convenience sampling methods, and testing whether the psychometric properties of the scales were replicable, thus suggesting that, as long as correlational studies are concerned, the administration method is unlikely to affect results. However, it is notable that mean scale scores were similar across samples for all measures except for the MW scales, which were markedly lower in the WEB sample than in the P&P (*d*[MW-S] = 0.86; *d*[MW-D] = 0.89). Given the differences in both age and sampling methods, it is unclear whether this result can be due to the administration method. When we compared the mean scores of these samples with those of the replication sample (MW-S mean score 13.80±6.04; MW-D mean score 15.62±6.23), we found that the mean reported level of MW was more similar to the WEB sample (*d*[MW-S] = 0.25; *d*[MW-D] = 0.23) than to the student P&P sample (*d*[MW-S] = −0.38; *d*[MW-D] = −0.43). Since the replication sample, too, included older participants than the P&P sample, this result seems to be consistent with previous studies that found that older adults mind wander less than do younger adults, at least during ongoing laboratory tasks (e.g., Giambra, 1989; Jackson & Balota, 2012), and this might be partly explained by older adults' tendency to perform more task-related, interfering thoughts than task-unrelated thoughts (McVay, Meier, Touron, & Kane, 2013). Actually, the correlations of MW-S and MW-D with age in the Carriere et al.'s (2013) study were negative and statistically significant (*r*s in the .15-.30s). The correlations of MW scores with age reported in Table 3 do not seem to fully replicate this result, as MW-D did not significantly correlate with age in the P&P nor in the WEB sample, while the negative correlation of MW-S with age was significant, albeit with a weak effect size, only in the WEB sample. However, it must considered that these samples had a limited age range (between 18 and 43). In the replication sample, where the age range was wider and more similar to Carriere et al.'s (2013) samples, we found that the correlations of MW-S and MW-D with age were negative and significant as expected (r = -.24, $p < .001$, and r = -.13, p = .029, respectively).

Future studies are needed to test the generalizability of our results to other populations of special interest for research on MW, such as adolescents and clinical samples. While our study showed the adequacy of the psychometric properties of the MW-S and the MW-D for university students, no data are currently available for younger students. In one of the very few studies on MW in young adults and adolescents, Stawarczyk et al (2014) found similar rates of MW during a task in both groups. Nonetheless, MW was found to be more closely tied to attentional control abilities in young adults than in adolescence, suggesting that the association patterns of MW with other characteristics can vary as a function of age. Mrazek et al. (2013) found that high levels of MW were associated with worse mood, greater stress and lower self-esteem in adolescents. However, in that study MW was assessed using the MWQ that, as mentioned earlier, appears to be a measure of spontaneous MW, thus leaving uninvestigated the associations with deliberate MW. Given their brevity, the MW-S and MW-D scales could also be a useful add-on to assessment batteries for psychological problems, as research has recently shown the association of spontaneous MW with ADHD (Seli et al., 2015c) and OCD (Seli et al., 2017). Future research on individual differences in MW-S and MW-D might also help in clarifying the association between MW and other kinds of internally-direction cognition, such as involuntary autobiographical memories and intrusive thoughts (see for a discussion, Maillet & Schacter, 2016; Vannucci, Batool, Pelagatti & Mazzoni, 2014).

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Footnotes

1. Amazon Mechanical Turk (Mturk) is an online labor market created by Amazon to assist scientists in hiring and paying participants for the completion of computerized tasks. However, Mturk is not available for scientists living outside the United States. In these cases, scientists can directly send the link to the survey to a mailing list of pre-selected participants or share it on social networks. These last two strategies allow a snowball sampling, since initially a relatively small group of participants are contacted, and these, in their turn, e-mail or share the link to other potential participants

2. The distinction between spontaneous and deliberate daydreaming is not explicitly reported in the DDFS, with the exception of the stem of item 9 ("I lose myself in *active* daydreaming", italic added). If some items of the DDFS were systematically interpreted in terms of spontaneous MW and others in terms of deliberate MW, we should find a neat simple structure in a two-factor solution. As a check, we performed this analysis, and we could not observe any meaningful grouping of the items, let alone the very high ($r > .70$) factor correlation.

Table 1

Factor Loadings from the Exploratory Factor Analysis of the Combined MW-D, MW-S, AC-D, and AC-S in the Paper-and-Pencil (P&P, n = 123) and the Online (WEB, n = 165) Samples and Parameter Estimates from the Confirmatory Factor Analysis Performed on Data from the Community Sample (n = 270)

	P&P				WEB				Community			
Item	1	2	3	4	1	2	3	4	1	2	3	4
MW-D:1	**.67**	**.33**	.08	.06	**.57**	**.40**	-.03	.20	**.86**	-	-	-
MW-D:2	**.81**	.09	-.07	.08	**.84**	.02	-.11	.05	**.84**	-	-	-
MW-D:3	**.73**	.04	-.14	-.03	**.57**	.01	.06	-.10	**.80**	-	-	-
MW-D:4	**.78**	.16	.04	-.03	**.66**	.16	.06	-.08	**.77**	-	-	-
MW-S:1	**.43**	**.59**	.26	.03	.18	**.70**	.18	.13	-	**.81**	-	-
MW-S:2	.19	**.62**	-.09	.14	.21	**.52**	.09	-.08	-	**.79**	-	-
MW-S:3	.06	**.84**	.02	.13	-.04	**.67**	.01	.10	-	**.78**	-	-
MW-S:4	**.32**	**.42**	.30	.24	.05	**.60**	.22	.19	-	**.80**	-	-
AC-D:1	-.07	.10	**.58**	.03	-.03	.06	**.59**	.13	-	-	**.67**	-
AC-D:2	.02	.23	**.58**	.16	.01	.12	**.52**	.23	-	-	**.74**	-
AC-D:3	-.06	.09	**.72**	.03	.04	.15	**.75**	.21	-	-	**.85**	-
AC-D:4	.04	-.07	**.79**	.04	.02	.12	**.74**	.19	-	-	**.81**	-
AC-S:1	-.01	.17	-.01	**.84**	-.05	.17	.19	**.80**	-	-	-	**.90**
AC-S:2	.01	.15	.01	**.82**	.02	.09	.17	**.89**	-	-	-	**.91**
AC-S:3	-.03	.08	.10	**.72**	-.07	-.05	.28	**.72**	-	-	-	**.76**
AC-S:4	.10	.00	.22	**.58**	-.01	.20	.30	**.70**	-	-	-	**.81**

Note. Boldface indicates substantial (i.e., >|.30|) factor loadings. MW-D: Mind Wandering: Deliberate; MW-S: Mind Wandering: Spontaneous; AC-D: Attentional Control: Distraction; AC-S: Attentional Control: Shifting; all parameter estimates in the community sample were significant at $p < .001$

Table 2

Results of item analyses for the Mind Wandering: Spontaneous (MW-S) and the Mind Wandering: Deliberate (MW-D) scales across samples

Scale	Sample		
	Paper and pencil (*n* =123)	Online (*n* =165)	Community (*n* =270)
Cronbach's alpha			
MW-S	.77	.73	.84
MW-D	.84	.76	.86
Mean inter-item correlation (range)			
MW-S	.57 (.41-.66)	.44 (.25-.56)	.57 (.53-.62)
MW-D	.45 (.32-.59)	.41 (.34-.50)	.61 (.51-.71)
Mean corrected item-total correlation (range)			
MW-S	.57 (.51-.63)	.52 (.46-.71)	.67 (.63-.70)
MW-D	.68 (.63-.75)	.56 (.46-.75)	.71 (.67-.78)
Mean squared multiple correlation (range)			
MW-S	.39 (.32-.46)	.29 (.22-.36)	.46 (.39-.50)
MW-D	.52 (.48-.59)	.35 (.26-.46)	.55 (.49-.64)

Table 3

Correlations, Cronbach's alphas and descriptive statistics of measures of mind wandering, attentional control and daydreaming

	Gender	Age	MW-S	MW-D	MWQ	AC-S	AC-D	DDFS	M	SD
						Paper and Pencil (P&P, *n* = 123)				
MW-S	-.09	-.01	*.77*						15.94	4.68
MW-D	-.05	.03	.43**	*.84*					18.14	5.16
AC-S	.05	.08	.29**	.06	*.83*				9.89	3.18
AC-D	.05	-.12	.17	-.04	.17	*.76*			13.16	3.64
MWQ	-.07	.05	.44**	.22*	.30**	.24**	*.78*		16.17	3.45
DDFS	-.21*	-.08	.40**	.50**	.10	.08	.31**	*.93*	37.37	9.28
						Online sample (WEB, *n* =165)				
MW-S	-.12	-.16*	*.73*						12.48	3.41
MW-D	-.14	.07	.27**	*.76*					14.39	3.37
AC-S	-.04	-.03	.25**	.01	*.89*				9.61	3.71
AC-D	-.20**	.02	.29**	.03	.46**	*.78*			13.01	3.69
MWQ	-.05	.08	.59**	.24**	.49**	.36**	*.77*		16.97	4.17
DDFS	-.19*	-.03	.48**	.47**	.33**	.27**	.52**	*.93*	39.59	9.84

Note: * p < .05; ** p < .01; Gender was coded 0 = Female, 1 = Male; MW-S: Mind Wandering - Spontaneous; MW-D: Mind Wandering - Deliberate; AC-S: Attentional control - Shifting; AC-D: Attentional control - Distraction; MWQ: Mind Wandering Questionnaire; DDFS: Daydreaming Frequency Scale; Italicized values on the main diagonal are Cronbach's alphas.

Table 4

Statistical tests ($Z_{contrasts}$) of the discriminant validity of Mind Wandering: Spontaneous (MW-S) and the Mind Wandering: Deliberate (MW-D) scales with respect to other measures of mind wandering, attentional control, and daydreaming across administration methods

Scale	Z	p	adj-p	r
Paper and Pencil (P&P)				
AC-S	2.39	.017	.034	.21
AC-D	2.22	.026	.035	.20
MWQ	2.45	.014	.034	.22
DDFS	-1.15	.249	.249	.10
Online sample (WEB)				
AC-S	2.50	.012	.017	.24
AC-D	2.73	.006	.013	.27
MWQ	4.43	<.001	<.001	.43
DDFS	.07	.947	.947	.01

Note: Z statistic; adj-p: Benjamini-Hochberg adjusted p-value; r =effect size ($r < .10$: negligible; $.10 < r < .30$: small; $.30 < r < .50$: moderate; $r > .50$: large); MW-S: Mind Wandering - Spontaneous; MW-D: Mind Wandering - Deliberate; AC-S: Attentional control - Shifting; AC-D: Attentional control - Distraction; MWQ: Mind Wandering Questionnaire; DDFS: Daydreaming Frequency Scale

Appendix

Italian versions of the Mind Wandering-Spontaneous and Mind Wandering-Deliberate scales

MW-S

Per ognuna delle seguenti affermazioni indica per favore l'alternativa di risposta che riflette nel modo più accurato la tua esperienza quotidiana.

1. Mi accorgo che la mia mente vaga liberamente, indipendentemente dalla mia volontà

   Raramente ❑1 ❑2 ❑3 ❑4 ❑5 ❑6 ❑7 Moltissimo

2. Quando la mia mente vaga i miei pensieri tendono a saltare da un argomento all'altro

   Raramente ❑1 ❑2 ❑3 ❑4 ❑5 ❑6 ❑7 Moltissimo

3. Quando la mia mente vaga liberamente, mi sembra di non avere il controllo sui miei pensieri

   Quasi mai ❑1 ❑2 ❑3 ❑4 ❑5 ❑6 ❑7 Quasi sempre

4. La mia mente si mette a vagare anche quando dovrei essere concentrato su qualcos'altro

   Raramente ❑1 ❑2 ❑3 ❑4 ❑5 ❑6 ❑7 Moltissimo

MW-D

Per ognuna delle seguenti affermazioni indica per favore l'alternativa di risposta che riflette nel modo più accurato la tua esperienza quotidiana.

1. Lascio intenzionalmente che i miei pensieri vaghino per conto loro

   Raramente ❑1 ❑2 ❑3 ❑4 ❑5 ❑6 ❑7 Quasi sempre

2. Mi piace quando la mia mente vaga per conto suo

   Raramente ❑1 ❑2 ❑3 ❑4 ❑5 ❑6 ❑7 Quasi sempre

3. Trovo che vagare con la mente sia un buon modo per affrontare la noia

   Per niente vero ❑1 ❑2 ❑3 ❑4 ❑5 ❑6 ❑7 Molto vero

4. Mi lascio assorbire da fantasie piacevoli

   Raramente ❑1 ❑2 ❑3 ❑4 ❑5 ❑6 ❑7 Quasi sempre

Electronic Supplementary Materials for the paper "Replicability of the psychometric properties of trait-levels measures of mind wandering"

1. Translation of the questionnaires and Italian version of the scales used in this study

The Mind Wandering-Spontaneous (MW-S) scale and Mind Wandering-Deliberate (MW-D) scale, the Attentional Control-Distraction (AC-D) scale and Attentional Control-Shifting (AC-S) scale, the Daydreaming Frequency Scale (DDFS), and the Mind-Wandering Questionnaire (MWQ) were translated into Italian through a forward- and back-translation procedure (Behling & Law 2000). The authors and 3 PhD students and post-doc in psychology independently translated the English version of the scales into Italian. After consensus among translators was achieved, an Italian-English bilingual speaker, blind to the original version, translated this preliminary version back into English. Discrepancies emerging from this back-translation and other issues about the adaptation into Italian were discussed, taking into account the meaning of the original English items and the consistency of the translation with the content domain of the constructs to be measured. After the final version of the items was drafted, the newly developed Italian version was administered to ten naïve individuals in order to check for comprehension and readability of items, which were found to be easy to understand and score. The Italian versions of the scales used in this study are reported below.

Behling, O., & Law, K. S. (2000). *Translating questionnaires and other research instruments: Problems and solutions*. Thousand Oaks, CA: Sage.

Italian AC-S

Per ognuna delle seguenti affermazioni indica per favore l'alternativa di risposta che riflette nel modo più accurato la tua esperienza quotidiana.

1. Quando passo da un compito ad un altro, sono lento nel rifocalizzare l'attenzione

Quasi mai ❑1 ❑2 ❑3 ❑4 ❑5 Sempre

2. Mi ci vuole un po' prima di riuscire a concentrarmi su un compito nuovo.

Quasi mai ❑1 ❑2 ❑3 ❑4 ❑5 Sempre

3. Mi risulta difficile alternarmi tra due compiti differenti

Quasi mai ❑1 ❑2 ❑3 ❑4 ❑5 Sempre

4. Dopo essere stato interrotto, ho difficoltà a riportare la mia attenzione su quello che stavo facendo prima

Quasi mai ❑1 ❑2 ❑3 ❑4 ❑5 Sempre

Italian AC-D

Per ognuna delle seguenti affermazioni indica per favore l'alternativa di risposta che riflette nel modo più accurato la tua esperienza quotidiana.

1. Ho difficoltà a concentrarmi quando c'è della musica nella stanza dove mi trovo

Quasi mai ❑1 ❑2 ❑3 ❑4 ❑5 Sempre

2. Quando lavoro intensamente a qualcosa, mi capita di essere distratto da ciò che succede intorno a me

Quasi mai ❑1 ❑2 ❑3 ❑4 ❑5 Sempre

3. Faccio molta fatica a concentrarmi su un compito difficile quando c'è rumore intorno a me

Quasi mai ❑1 ❑2 ❑3 ❑4 ❑5 Sempre

4. Quando sto leggendo o studiando, mi distraggo facilmente se ci sono persone che parlano nella stessa stanza.

Quasi mai ❑1 ❑2 ❑3 ❑4 ❑5 Sempre

Italian MWQ

Indica per favore con quale frequenza ti capita ognuna delle seguenti situazioni, ricordando che:

1	2	3	4	5	6
Quasi Mai	Molto di rado	Di rado	Di frequente	Molto di frequente	Quasi sempre

1. Ho difficoltà a mantenere l'attenzione su un compito semplice o ripetitivo	1	2	3	4	5	6
2. Quando leggo, mi accorgo di non aver prestato attenzione al testo e devo leggerlo un'altra volta	1	2	3	4	5	6
3. Faccio le cose senza prestare piena attenzione	1	2	3	4	5	6
4. Mi capita di ascoltare qualcosa con un orecchio, e allo stesso tempo pensare a tutt'altro	1	2	3	4	5	6
5. La mia mente tende a vagare durante lezioni, conferenze, dibattiti, etc...	1	2	3	4	5	6

Italian DDFS

Nel seguente questionario troverai delle domande sui tuoi "sogni ad occhi aperti". Nota che questo termine è inteso nel senso più comune, senza che vi sia alcuna definizione "ufficiale". Per favore, poni particolare attenzione alla distinzione fra i pensieri che hai quando stai svolgendo un preciso compito, come lavorare o studiare, e i "sogni ad occhi aperti" ossia tutti quei pensieri o fantasie che non c'entrano niente col compito che stai svolgendo e che potresti avere anche in altre situazioni, come ad esempio durante un viaggio noioso o mentre ti stai addormentando. Per ogni domanda, indica l'alternativa di risposta che pensi descriva meglio il tuo caso.

1. Faccio sogni ad occhi aperti:

❑1 raramente
❑2 una volta alla settimana
❑3 una volta al giorno
❑4 qualche volta al giorno
❑5 molte volte al giorno

2. Sogni ad occhi aperti e fantasticherie costituiscono:

❑1 lo 0% dei miei pensieri da sveglio
❑2 meno del 10% dei miei pensieri da sveglio
❑3 almeno il 10% dei miei pensieri da sveglio
❑4 almeno il 25% dei miei pensieri da sveglio
❑5 almeno il 50% dei miei pensieri da sveglio

3. Per quanto riguarda i sogni ad occhi aperti, mi definisco una persona che:

❑1 non fa mai sogni ad occhi aperti
❑2 solo raramente fa sogni ad occhi aperti
❑3 tende occasionalmente a fare sogni ad occhi aperti
❑4 tende moderatamente a fare sogni ad occhi aperti
❑5 fa abitualmente sogni ad occhi aperti

4. Ricordo o penso ai miei sogni ad occhi aperti:

❑1 raramente
❑2 una volta a settimana
❑3 una volta al giorno
❑4 qualche volta al giorno
❑5 molte volte al giorno

5. Quando non presto attenzione a ciò che sto facendo (al mio lavoro, ad un libro, o alla TV), tendo a fare sogni ad occhi aperti:

❑1 lo 0% del tempo
❑2 il 10% del tempo
❑3 il 25% del tempo
❑4 il 50% del tempo
❑5 il 75% del tempo

6. Invece di prestare attenzione alle persone e agli eventi che accadono intorno a me, sono perso nei miei pensieri per circa:

❑1 lo 0% del tempo
❑2 meno 10% del tempo
❑3 il 10% del tempo
❑4 il 25% del tempo
❑5 il 50% del tempo

7. Sogno ad occhi aperti mentre lavoro o studio:

❑1 raramente
❑2 una volta a settimana
❑3 una volta al giorno
❑4 qualche volta al giorno
❑5 molte volte al giorno

8. Ricordare eventi del passato, pensare al futuro o immaginare situazioni inusuali occupa:

❑1 lo 0% dei miei pensieri da sveglio
❑2 meno del 10% dei miei pensieri da sveglio
❑3 il 10% dei miei pensieri da sveglio
❑4 il 25% dei miei pensieri da sveglio
❑5 il 50% dei miei pensieri da sveglio

9. Mi perdo volontariamente in sogni ad occhi aperti:

❑1 raramente
❑2 una volta a settimana
❑3 una volta al giorno
❑4 qualche volta al giorno
❑5 molte volte al giorno

10. Ogni volta che ho del tempo a disposizione, mi metto a fare sogni ad occhi aperti:

❑1 mai
❑2 raramente
❑3 qualche volta
❑4 frequentemente
❑5 sempre

11. Quando sono ad una riunione, spettacolo, o lezione non particolarmente interessanti, invece di prestare attenzione, sogno ad occhi aperti:
- ❑1 mai
- ❑2 raramente
- ❑3 qualche volta
- ❑4 frequentemente
- ❑5 sempre

12. Durante un lungo viaggio in autobus, treno o aereo faccio sogni ad occhi aperti:
- ❑1 mai
- ❑2 raramente
- ❑3 qualche volta
- ❑4 frequentemente
- ❑5 la maggior parte del tempo

2. Results of exploratory factor and item analysis of measures of mind wandering, attentional control and daydreaming across administration methods

In order to carry out this study on Italian participants, all the measures were adapted into Italian and their psychometric properties had to be tested. First, we tested whether a measurement model with a single factor could be considered as adequate. Given the limited sample sizes and, consequently, the lack of statistical power, we relied on exploratory factor analysis (EFA), for which the sample sizes were adequate according to de Winter et al. (2009).

In order to determine the optimal number of factors for the MW-S and the MW-D we evaluated the scree-plot, performed parallel analysis (Horn, 1965) and computed the minimum average partial correlation (MAP) statistic (Velicer, 1976). Parallel analysis involves the generation of (generally 1,000) random datasets having the sample size and number of variables of the original one. Factor analysis is then run on each of the random datasets, resulting in 1,000 sets of eigenvalues. Then, the 95th percentile is computed for the largest, the second largest, the third largest, etc., eigenvalue in the set. Finally, the actual eigenvalues are compared with these, and only those factors whose observed eigenvalues are larger than the random eigenvalues are retained.

The MAP test based on the average partial correlations between the variables after successively removing the effect of the factors. The factor with the largest eigenvalue is removed first and its effect on the correlations between the items is excluded. Next, the factor with the second largest eigenvalue is excluded and so on. In each step, the squared average partial correlations between the items are computed. The optimal number of factors is the one that minimizes the squared average partial correlations.

As reported in Table 2.1, Table 2.2, and shown in Figure 2.1, regardless of the administration method in all scales only the first observed eigenvalue was larger than the corresponding random one, and the minimum value of the MAP always occurred with one factor. Moreover, the percentage of variance accounted for by the first factor always exceeded 50% and the factor loadings on the single factor ranged from .43 to .93. Taken together, these results support the adequacy of the one-factor solution in all scales. Moreover, the congruence coefficients between paper-and-pencil and online data were close to one, suggesting a substantial equality of the factor loading matrices (Lorenzo-Seva & Ten Berge, 2006).

Table 2.3 reports the results of the item analyses. Depending on the narrowness of the content domain, some mean inter-item correlations were larger (i.e., > .40) for more specific constructs (e.g., MW-D), and smaller (i.e., < .40) for more broadly defined constructs (e.g., MWQ). In any case, corrected item-total correlations were always well above .30, indicating an adequate ability of the items to discriminate between high and low levels of the traits and squared multiple correlations were all above .10, suggesting that items always shared more than 10% of variance with the others in the same scale. Finally, in no case the removal of an item could provide a substantial (> .01) increase in the Cronbach's alpha, indicating that all items contributed to the reliability of observed scores (Nunnally & Bernstein, 1994).

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Table 2.1 Summaries of the results of factor analyses and congruence coefficients

Scale	Administration method P&P	 WEB
Observed eigenvalues§		
MW-S	2.37-0.81-0.47-0.35	2.23-0.68-0.61-0.48
MW-D	2.73-0.61-0.40-0.26	2.33-0.76-0.53-0.38
AC-S	2.67-0.65-0.45-0.23	2.99-0.43-0.40-0.18
AC-D	2.36-0.67-0.62-0.35	2.42-0.64-0.59-0.36
MWQ	2.65-0.81-0.59-0.53	2.62-0.84-0.63-0.54
DDFS	6.75-0.88-0.68-0.66	6.75-0.98-0.70-0.64
Random eigenvalues 95th percentile§		
MW-S	1.34-1.13-0.99-0.90	1.28-1.11-1.00-0.91
MW-D	1.32-1.12-0.99-0.90	1.27-1.11-1.00-0.90
AC-S	1.34-1.13-1.00-0.90	1.28-1.11-1.00-0.91
AC-D	1.33-1.12-0.99-0.90	1.27-1.11-1.00-0.91
MWQ	1.38-1.19-1.06-0.96	1.33-1.16-1.05-0.96
DDFS	1.68-1.49-1.36-1.26	1.58-1.42-1.31-1.22
Percentage of variance explained by the 1-factor solution		
MW-S	59.17	55.78
MW-D	68.16	58.23
AC-S	66.67	74.86
AC-D	59.07	60.45
MWQ	52.93	52.36
DDFS	56.22	56.21
Mean factor loading (range)		
MW-S	.67 (.59-.77)	.64 (.55-.75)
MW-D	.76 (.69-.84)	.67 (.54-.83)
AC-S	.74 (.56-.86)	.82 (.75-.93)
AC-D	.67 (.55-.80)	.69 (.57-.79)
MWQ	.64 (.43-.74)	.63 (.45-.72)
DDFS	.72 (.53-.84)	.72 (.60-.82)
Congruence coefficients		
MW-S	.99	
MW-D	.98	
AC-S	.99	
AC-D	1.00	
MWQ	1.00	
DDFS	1.00	

Note: P&P: Paper-and-pencil sample (*n* = 123); WEB: Online sample (*n* = 165); MW-S: Mind Wandering - Spontaneous; MW-D: Mind Wandering - Deliberate; AC-S: Attentional control - Shifting; AC-D: Attentional control - Distraction; MWQ: Mind Wandering Questionnaire; DDFS: Daydreaming Frequency Scale; § For the MWQ and the DDFS, only the first four eigenvalues are reported.

Table 2.2 Factor loadings from the 1-factor exploratory factor analyses

	Administration method	
Scale	P&P	WEB
MW-S		
MWS01	.71	.75
MWS02	.62	.55
MWS03	.77	.61
MWS04	.59	.65
MW-D		
MWD01	.69	.62
MWD02	.84	.83
MWD03	.73	.54
MWD04	.77	.68
AC-S		
ACS01	.86	.83
ACS02	.84	.93
ACS03	.72	.76
ACS04	.56	.75
AC-D		
ACD01	.58	.61
ACD02	.55	.57
ACD03	.77	.78
ACD04	.80	.79
MWQ		
MWQ01	.43	.45
MWQ02	.74	.60
MWQ03	.71	.72
MWQ04	.68	.68
MWQ05	.63	.71
DDFS		
DDFS01	.80	.76
DDFS02	.78	.82
DDFS03	.84	.82
DDFS04	.71	.76
DDFS05	.72	.72
DDFS06	.53	.60
DDFS07	.63	.70
DDFS08	.70	.69
DDFS09	.73	.77
DDFS10	.80	.70
DDFS11	.67	.61
DDFS12	.72	.68

Note: P&P: Paper and Pencil sample (n = 123); WEB: Online sample (n = 165); MW-S: Mind Wandering - Spontaneous; MW-D: Mind Wandering - Deliberate; AC-S: Attentional control - Shifting; AC-D: Attentional control - Distraction; MWQ: Mind Wandering Questionnaire; DDFS: Daydreaming Frequency Scale

Figure 2.1 Scree-plot, parallel analysis and minimum average partial (MAP) correlation statistic for the MW-S

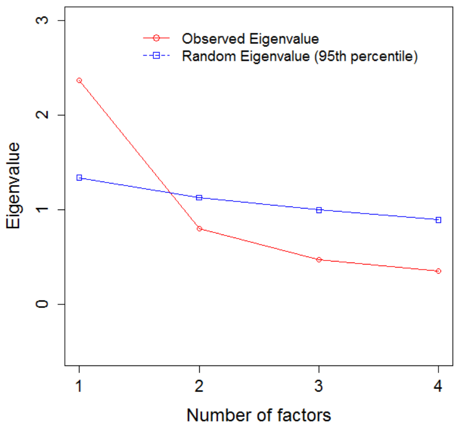
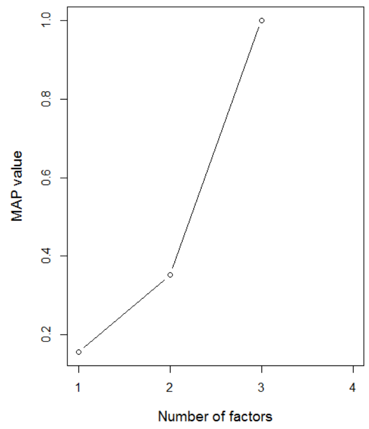
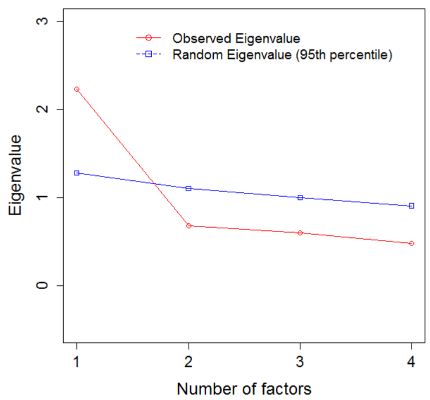
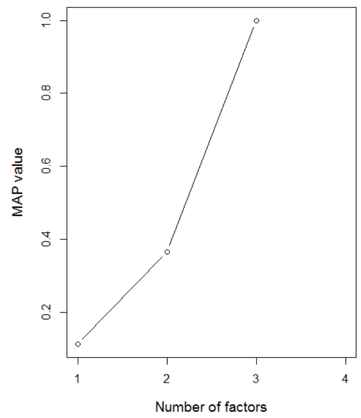
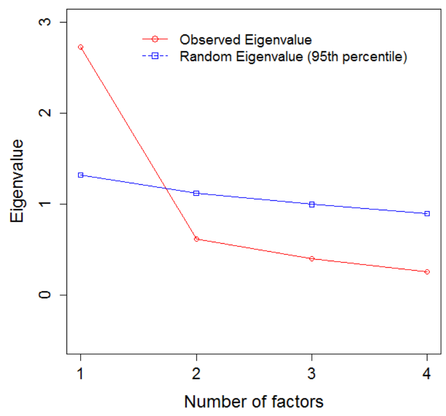
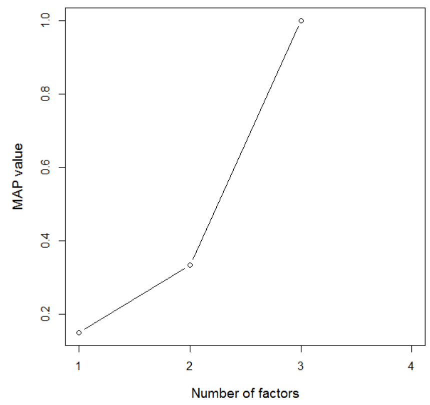
	Parallel Analysis and Scree Plot	MAP
P&P (*n* = 123)		
WEB (*n* = 165)		

Figure 2.2 Scree-plot, parallel analysis and minimum average partial (MAP) correlation statistic for the MW-D

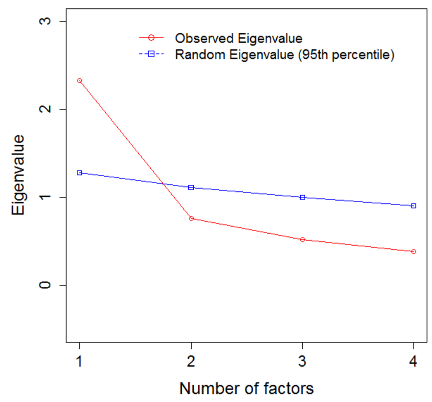
	Parallel Analysis and Scree Plot	MAP

P&P (n = 123)





WEB (n = 165)



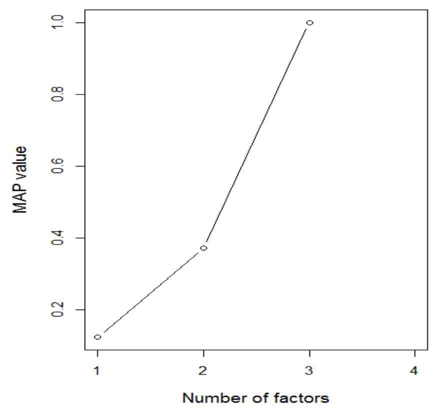


Figure 2.3 Scree-plot, parallel analysis and minimum average partial (MAP) correlation statistic for the AC-S

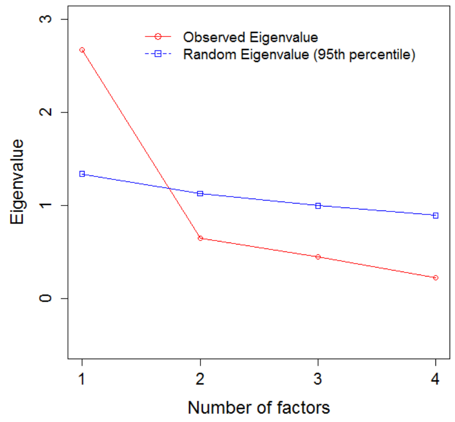
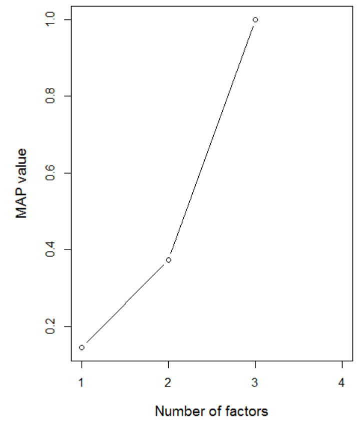
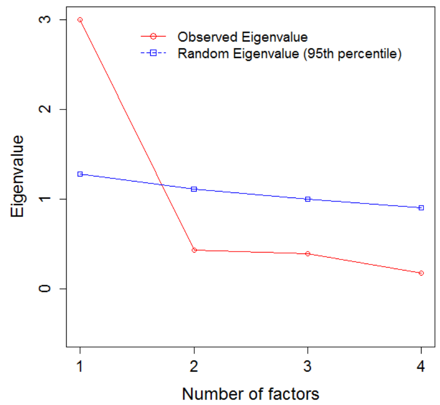
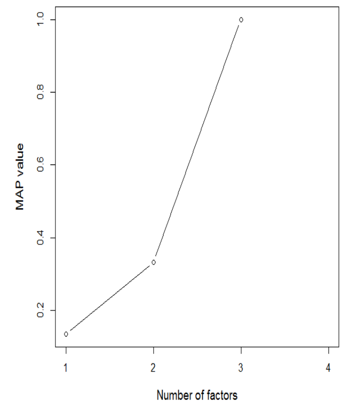
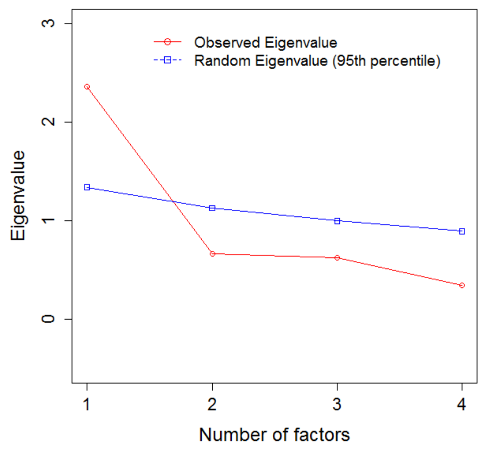
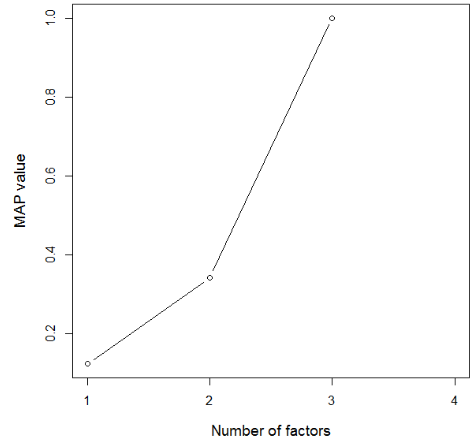
	Parallel Analysis and Scree Plot	MAP
P&P (n = 123)		
WEB (n = 165)		

Figure 2.4 Scree-plot, parallel analysis and minimum average partial (MAP) correlation statistic for the AC-D

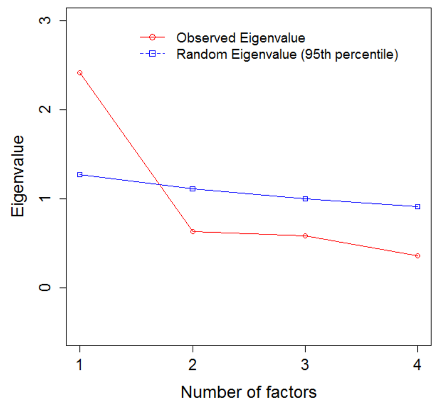
	Parallel Analysis and Scree Plot	MAP

P&P (n = 123)





WEB (n = 165)



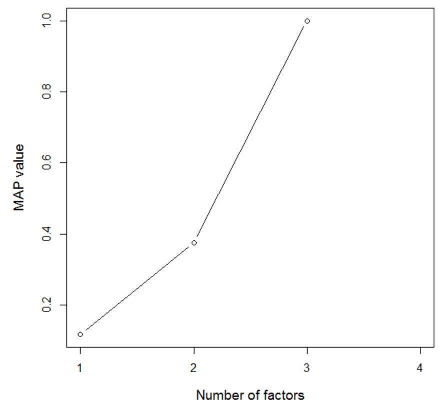


Figure 2.5 Scree-plot, parallel analysis and minimum average partial (MAP) correlation statistic for the MWQ

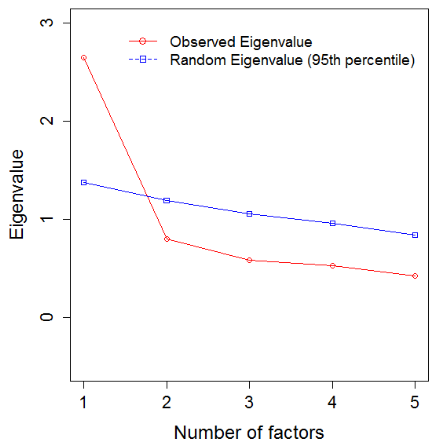
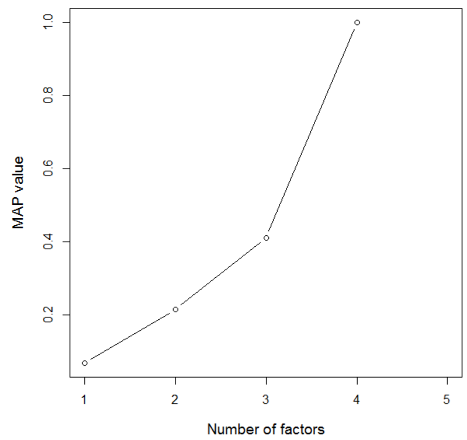
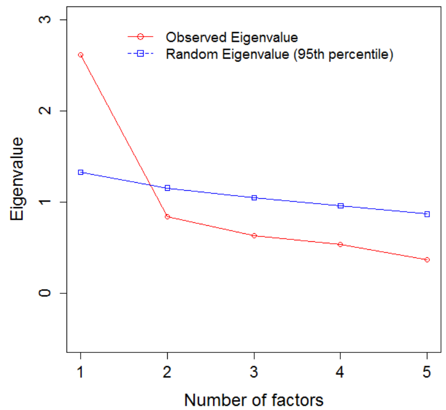
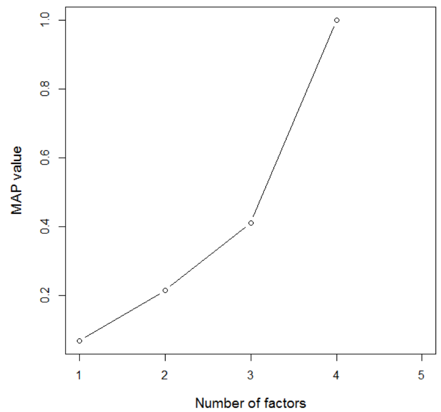
	Parallel Analysis and Scree Plot	MAP
P&P (n = 123)		
WEB (n = 165)		

Figure 2.6 Scree-plot, parallel analysis and minimum average partial (MAP) correlation statistic for the DDFS

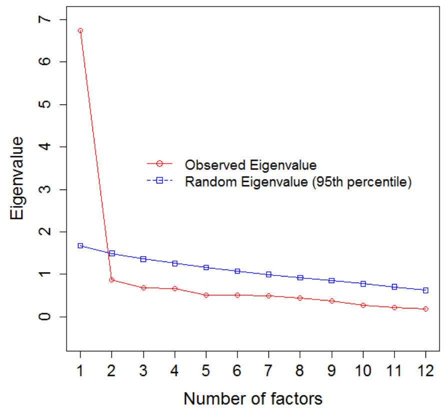
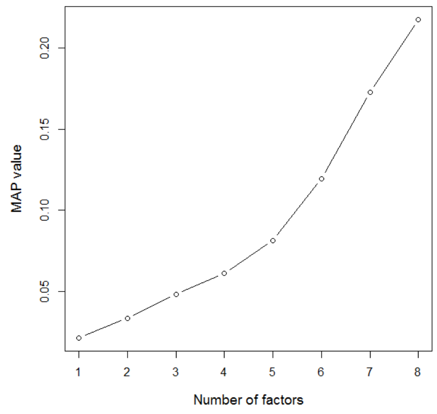
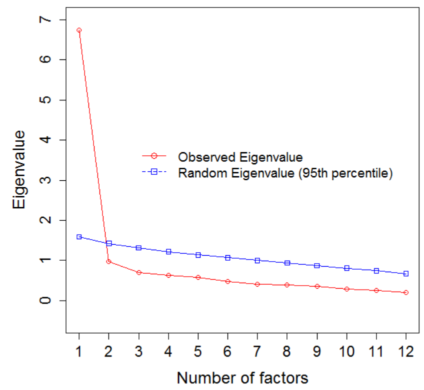
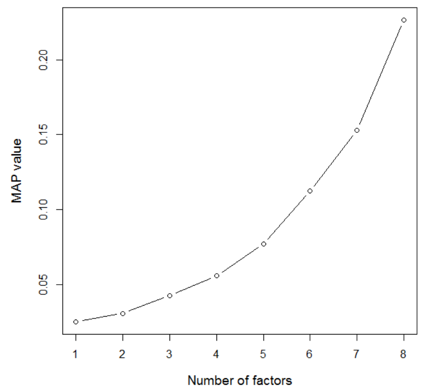
	Parallel Analysis and Scree Plot	MAP
P&P (*n* = 123)		
WEB (*n* = 165)		

Table 2.2 Results of item analyses on all measures

	Administration method	
Scale	P&P	WEB
Mean inter-item correlation (range)		
MW-S	.57 (.41-.66)	.44 (.25-.56)
MW-D	.45 (.32-.59)	.41 (.34-.50)
AC-S	.55 (.43-.76)	.66 (.59-.80)
AC-D	.45 (.37-.65)	.47 (.38-.64)
MWQ	.28 (.09-.46)	.40 (.25-.57)
DDFS	.52 (.31-.75)	.52 (.32-.72)
Mean corrected item-total correlation (range)		
MW-S	.57 (.51-.63)	.52 (.46-.71)
MW-D	.68 (.63-.75)	.56 (.46-.75)
AC-S	.66 (.52-.73)	.75 (.70-.87)
AC-D	.57 (.48-.65)	.58 (.50-.76)
MWQ	.55 (.38-.62)	.54 (.40-.61)
DDFS	.69 (.52-.80)	.69 (.58-.79)
Mean squared multiple correlation (range)		
MW-S	.39 (.32-.46)	.29 (.22-.36)
MW-D	.52 (.48-.59)	.35 (.26-.46)
AC-S	.49 (.28-.63)	.60 (.50-.74)
AC-D	.36 (.24-.47)	.37 (.25-.47)
MWQ	.24 (.16-.31)	.34 (.18-.41)
DDFS	.55 (.35-.71)	.56 (.45-.67)
Highest Cronbach's alpha value if the item was removed		
MW-S	.74 (.77)	.71 (.73)
MW-D	.82 (.84)	.75 (.76)
AC-S	.83 (.83)	.87 (.89)
AC-D	.75 (.76)	.76 (.78)
MWQ	.78 (.78)	.77 (.77)
DDFS	.92 (.93)	.92 (.93)

Note: P&P: Paper and Pencil sample (n = 123); WEB: Online sample (n = 165); MW-S: Mind Wandering - Spontaneous; MW-D: Mind Wandering - Deliberate; AC-S: Attentional control - Shifting; AC-D: Attentional control - Distraction; MWQ: Mind Wandering Questionnaire; DDFS: Daydreaming Frequency Scale.

3. Statistical comparison of correlation coefficients between the paper-and-pencil (P&P) and Web-based (WEB) data

Variables	*r* (P&P)	*r* (WEB)	*Z*	*p*	*adj-p*	r_{ES}
MW-S, MW-D	.43	.27	1.51	.132	.283	.09
MW-S, MWQ	.44	.59	1.76	.078	.233	.10
MW-S, AC-S	.29	.25	0.35	.724	.834	.02
MW-S, AC-D	.17	.29	1.01	.313	.522	.06
MW-S, DDFS	.40	.48	0.78	.436	.653	.05
MW-D, MWQ	.22	.24	0.17	.866	.866	.01
MW-D, AC-S	.06	.01	0.38	.704	.834	.02
MW-D, AC-D	-.04	.03	0.64	.521	.710	.04
MW-D, DDFS	.50	.47	0.28	.778	.834	.02
MWQ, AC-S	.30	.49	1.82	.069	.233	.11
MWQ, AC-D	.24	.36	1.06	.289	.522	.06
MWQ, DDFS	.31	.52	2.09	.037	.233	.12
AC-S, AC-D	.17	.46	2.75	.006	.090	.16
AC-S, DDFS	.10	.33	1.97	.049	.233	.12
AC-D, DDFS	.08	.27	1.65	.099	.247	.10

Note: P&P: Paper-and-pencil sample (n = 123); WEB: Online sample (n= 165); r: Pearsonian correlation coefficient; Z: Z statistic; p: p-value; adj-p: Benjamini-Hochberg's (2000) adjusted p-value; r_{ES} =effect size ($r < .10$: negligible; $.10 < r < .30$: small; $.30 < r < .50$: moderate; $r > .50$: large); MW-S: Mind Wandering - Spontaneous; MW-D: Mind Wandering - Deliberate; MWQ: Mind Wandering Questionnaire; AC-S: Attentional control - Shifting; AC-D: Attentional control - Distraction; DDFS: Daydreaming Frequency Scale