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Evaluation of the Everyday Memory Questionnaire-Revised (EMQ-R)

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Abstract

The goal of this research was to conduct a preliminary Bosnian/Serbian general sample validation of the Everyday Memory Questionnaire-Revised (EMQ-R). The sample comprised 504 participants (51.06% females) from Bosnia and Herzegovina, of the average age of 27.79 years. Out of several tested factor models, a bifactor model, which assumes one general (memory disturbance) factor, comprised of all EMQ-R items, in addition to domain-specific Retrieval and Attentional Tracking factors, showed the best fit. Additional analyses suggested that a simple total-scale summary score is probably the most appropriate operationalization of the EMQ-R on a general sample. The EMQ-R's correlated with other constructs in line with the expectations. It was related to higher Neuroticism and lower Conscientiousness, as well as to higher depressiveness, for which it was incrementally predictive over and beyond the Big 5 personality traits. We recommend the use of EMQ-R on Bosnian/Serbian general (i.e., non-clinical) samples. However, validations on relevant clinical samples are yet to be conducted.

Keywords: everyday memory, EMQ-R, Big 5 personality traits, depressiveness, questionnaire validation

Introduction

The Everyday Memory Questionnaire (EMQ) is a subjective measure of memory failure in everyday life, developed to study the effects of closed-head injuries on memory performance (Sunderland, Harris, & Baddeley, 1983, 1984), even though it can also be used in non-clinical samples (Cornish, 2000; Royle & Lincoln, 2008). The original EMQ consisted of 35 items (Sunderland et al., 1983). Over the years, several new versions were developed, which used different numbers of the original EMQ items and different response scales (Calabria, et al., 2011; Sunderland et al., 1984; Tinson & Lincoln, 1987). In all versions, EMQ items measure an absolute frequency (e.g., “once a day”) of a particular “memory failure”.

Inconsistent factor structures have been reported for different EMQ version and samples (e.g., Calabria, et al., 2011; Cornish, 2000; Eflikides et al., 2002; Richardson & Chan, 1995; Royle & Lincoln, 2008).

The EMQ-R (Royle & Lincoln, 2008) is fairly recent, short (13-item) EMQ version, validated on MS, stroke and non-

clinical samples (Royle & Lincoln, 2008). It contains two factors: Retrieval and Attentional Tracking, with an additional 2-item-factor, without a name or clear interpretation (the items refer to starting to read something we have already read, and forgetting where things are kept) (Royle & Lincoln, 2008). Retrieval factor indicates problems with recalling information from long-term memory. Attentional tracking is related to problems with attention or working memory.

The goal of this research is to conduct a preliminary Bosnian/Serbian general sample validation of the EMQ-R, focusing on its factor structure and convergent, divergent, and predictive validity. Specifically, we are interested in EMQ-R's associations with the Big 5 personality traits and depressiveness. Previous research has shown that higher Neuroticism (Klaming, Veltman, & Comijs, 2017) and lower Self-directedness (Rönnlund, Vestergren, Mäntylä, & Nilsson, 2011) (Self-directedness corresponds to low Neuroticism and high Conscientiousness from the Big 5; De Fruyt, Van De Wiele, & Van Heeringen, 2000) predict memory problems. Thus, we would expect EMQ-R to correlate with higher Neuroticism and lower Conscientiousness, but not to other Big 5 traits. Furthermore, since memory problems are common during the depression (Bruce & Arnett, 2004), we would expect EMQ-R to correlate with depressiveness, potentially incrementally predicting it over the Big 5 traits.

Method

Sample

The sample comprised 504 conveniently selected general population participants (51.06% females) from Bosnia and Herzegovina. The average age was 27.79 ($SD=8.39$) years. Participants were recruited by an anonymous online survey.

Instruments

EMQ-R. (Royle & Lincoln, 2008) has two subscales: Retrieval (7 items) and Attentional Tracking (4 items), with two items that are added only when a total score is used. There are 13 items, answered on a 5-point scale (from “0 = Once or less in the last month.” to “4 = Once or more in a

day.”). With permissions, the EMQ-R was translated (and adapted) to Serbian for this study.

Other measures. BFI-44 (John, Donahue, & Kentle, 1991) was used as a measure of the Big 5 traits, and PHQ-9 Kroenke & Spitzer, 2002; Kroenke, Spitzer, & Williams, 2001; Bosnian-Croatian-Serbian validation: Subotić, 2015) was used as a measure of depressiveness.

Results

Factor structure

We used a DWLS/WLSMV based confirmatory factor analysis (Rosseel, 2012) to test three latent EMQ-R models: 1) three correlated factors (Retrieval + Attentional Tracking + two additional items as a separate factor), 2) one factor, and 3) a bifactor model, with one general (memory disturbance) factor, comprised of all the EMQ-R items, in addition to domain-specific Retrieval and Attentional Tracking factors (two unassigned items were put to the general factor).

Bifactor model had the best fit (Hooper, Coughlan, & Mullen, 2008): $\chi^2(54) = 150.61, p < .001$; CFI = .990, TLI = .985, RMSEA = .060, 90% CI [.048, .071], followed by the three-factor model: $\chi^2(62) = 355.27, p < .001$; CFI = .968, TLI = .960, RMSEA = .097, 90% CI [.087, .107], and a one-factor model: $\chi^2(65) = 470.16, p < .001$; CFI = .956, TLI = .947, RMSEA = .111, 90% CI [.102, .121].

In a bifactor model, general factor explains 88.16% of the variance. General factor’s internal consistency (Zinbarg, Revelle, Yovel, & Li, 2005) is good: $\alpha = .94, \omega = .88$, and similar to the one-factor model values: $\alpha \approx \omega \approx .91$. Factor loadings are generally high in both models ($\Lambda_s > .50$).

In a three-factor model, factors are very highly correlated: .89, .88, and .98, respectively. Factor scores of the bifactor’s general factor, factor scores of a one-factor model, and a total scale summary scores are all highly correlated: .98, .96, and .97, respectively. Due to all of this, we opted to use the EMQ-R total scale summary score in all subsequent analyses.

Mean summary scores are roughly equal for males ($M = 0.98, SD = 0.67$) and females ($M = 0.87, SD = 0.73$): $t(502) = -1.76, d = 0.16, p = .078$. Differences between younger and older participants were not considered, due to a small number of older participants (81.2% were ≤ 35 years old).

Convergent, divergent, and predictive validity

The Big 5 traits explain 17.14% of the EMQ-R’s variance. Significant predictors (all $ps < .001$) are: lower Conscientiousness ($\beta = -.28; r = -.37$) and higher Neuroticism ($\beta = .17; r = .28$). The EMQ-R significantly ($p_\Delta < .001$) predicts depressiveness scores ($\beta = .31; r = .38, p < .001$) above the Big 5 traits, explaining an additional 7.80% of the depressiveness’ variance over the starting 35.32% accounted for by the Big 5 (Table 1). Note that specific EMQ-R factors (from a bifactor model) do not incrementally predict depressiveness scores ($R^2_\Delta = .003, p_\Delta = .303$) above the Big 5 traits and a general EMQ-R factor.

Table 1: Prediction of depressiveness.

Predictors	β_1 / β_2
Big 5 traits	
Neuroticism*	.278/.264
Extraversion*	.361/.339
Agreeableness	.422/.397
Conscientiousness*	.378/.367
Openness to Experience*	.370/.348
EMQ-R total score*	NA/.279

Notes: β_1 / β_2 are standardized regression correlations from step 1 (Big 5 predicts depressiveness) and step 2 (Big 5 + EMQ-R total score predict depressiveness), respectively. Significant predictors are marked with * (significant predictors from step 1 remained significant in step 2).

Discussion

The results show that the EMQ-R has good psychometric properties (i.e., fit and internal consistency) on a general Bosnian/Serbian sample. However, instead of a three-factor structure, we determined that a bifactors solution fits the data best. This solution assumes a general (memory failure) factor (which accounts for the vast majority of the variance), in addition to domain-specific (Retrieval and Attentional Tracking) factors. If three factors are extracted, they are correlated much more strongly than previously reported (Royle & Lincoln, 2008). Combined with the fact that a total score has good internal consistency, and that specific factors are not predictive over the general factor, we suggest that, at least for the general sample, a simple total summary score is the most appropriate operationalization of the EMQ-R.

The EMQ-R’s correlations with other constructs are in line with the expectations. The total score is related to higher Neuroticism and lower Conscientiousness (which suggests convergent validity), but not to other Big 5 personality traits (which suggests divergent validity) (Klaming et al., 2017; Rönnlund et al., 2011). It also correlates with depressiveness (Bruce & Arnett, 2004), and even predicts it over and beyond the Big 5 traits (which suggests predictive validity).

In conclusion, we recommend the use the EMQ-R’s translation on Bosnian/Serbian general (i.e., non-clinical) samples. We suggest that a total score should be used, but the EMQ-R should also be validated on relevant clinical samples, on which this might not be an appropriate scoring.

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