The Prospective Retrospective Memory Questionnaire: Psychometric properties and normative data of a Dutch translation

Ten years ago the Prospective Retrospective Memory Questionnaire (PRMQ) was specifically developed to assess perceived problems concerning both episodic memory and memory for future intentions. Since then, various PRMQ translations have been carried out. These previous studies of this self-report measure showed not only good psychometric properties, but also a cross-culturally robust underlying factor structure. The PRMQ has also been used in many clinical studies. The aforementioned findings were the reason to present and test the Dutch translation of the PRMQ and compare its psychometric properties with that of previous studies. The analyses involved both non-clinical (N = 425) and clinical (N = 217) participants. The results confirmed the previously reported underlying structure of the PRMQ, the good internal consistency, and the validity of this measure. Therefore, we decided to also present normative data of this new translation. Possible future uses and sensitivity issues are discussed.

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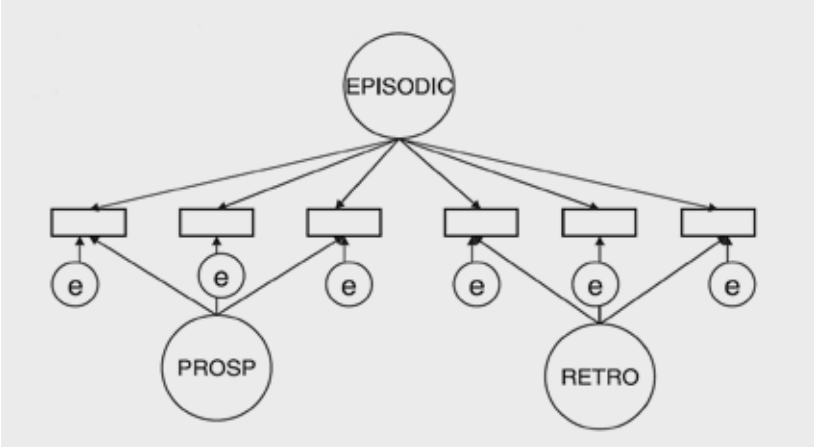
In this study we present the Dutch translation of the Prospective Retrospective Memory Questionnaire (PRMQ) and compare its underlying structure and psychometric properties with previous international studies. The authors of the PRMQ had noticed that memory studies of Alzheimer's disease focused mainly on the assessment of episodic memory. They also perceived a similar bias for retrospective memory in the existing self-report measures of cognitive failures (Smith, Della Sala, Logie, & Maylor, 2000). This, despite the fact that it had been argued before that forgetting appointments, forgetting to take medication, or forgetting to turn the iron off, could have serious negative consequences for independent daily living (Einstein & McDaniel, 1996). At that time in the existing self-report measures, few items addressed prospective memory failures: Cognitive Failure Questionnaire (2 out of 25 items) and in the Everyday Memory Questionnaire (3 out of 28 items) (Broadbent, Cooper, Fitzgerald, & Parkes, 1982; Sunderland, Harris, & Baddely, 1984). Smith et al. (2000) developed the PRMQ not only to fill this gap but also to study whether ageing affected memory for past events differentially from memory for future intentions. The PRMQ was a concise 16-item self-report measure that not only balanced the number of retrospective and prospective memory items, but also made distinctions between short- versus long-term memory, and self-cued and environmentally cued memory. Item validity was then assessed by asking eight colleague memory researchers to classify each of the 16 memory items into the eight (2 x 2 x

2) pre-defined categories, e.g. items representing a prospective short-term self-cued memory failure. This procedure resulted in a high consistency of classifications among the raters. Although the intended underlying structure of the PRMQ was not formally tested until two years later, subsequent research among a variety of both clinical and normative studies strongly suggested that the a-priori selected items were not only reliable, but also represented a surprisingly robust but more simple underlying structure.

The first normative study that also tested the underlying structure of the PRMQ found that the data were best suited to a three-factor model with a general (episodic) memory factor corresponding to all of the PRMQ items and two orthogonal specific factors of prospective and retrospective memory (Figure 1). Both of these factors corresponded to the intended prospective and retrospective subscale items (Crawford, Smith, Maylor, Della Sala, & Logie, 2003). This tripartite model seemed to be in line with the theoretical contention that prospective memory could not entirely be dissociated from retrospective memory. It had already been argued by the authors of the PRMQ and other researchers, that the ability to remember intentions at the appropriate time in the future involves various cognitive processes. For example, to remember that one has to return a book to the library not only requires active monitoring of the time that has passed, but also retrospective memory such as the actual books and return dates that are concerned. Furthermore it might involve goal planning, e.g. when one can make time to return the books in question. Both time monitoring and goal planning can be facilitated by external cues. Nevertheless one has to remember what exactly has to be done (McDaniel & Einstein, 2000).

Since its first psychometric evaluation, the PRMQ had been translated into various languages, e.g. Japanese, Swedish, Portuguese (Gondo, Renge, Ishioka, Kurokawa, & Euenon, 2010; Rönnlund, Mantyla, & Nilsson, 2008; Piauilino, Bueno, Tufik, Bittencourt, Santos-Silva, & Hachul, 2010). The cross-cultural findings consistently indicated satisfactory psychometric properties. A recent Brazilian population-based random sampling study of the PRMQ tested the latent structure of the PRMQ and compared the results with those of the original British, and subsequent Swedish normative studies (Piauilino et al., 2010). The authors not only found a high degree of similarity between the outcomes of the structural equation modelling results, but also for the reliability and validity properties.

Figure 1 Three-factor model



Our first aim was compare the underlying structure of the Dutch translation of the PRMQ with the aforementioned findings. Our second aim was to present reliability data in both a clinical and control sample. The third aim was to provide tentative normative data and study the gender and age effects on the PRMQ measures, while our last aim was to provide validity data.

Method

PRMQ

The PRMQ was translated into Dutch by a fellow clinical neuropsychologist (HB) who is proficient in the English language. This translation was subsequently judged and compared with the original English version by the author of this article (SvdW), a fellow Dutch neuropsychologist (SV), and a person with a native English speaking background, but who had lived in the Netherlands for over twenty years, and was proficient in the Dutch language (IM). The Dutch translation of the PRMQ is available upon request by the corresponding author of this article.

Validity assessment

For the validity assessments we compared the data of the PRMQ with those of the Multimodal Memory Questionnaire (MMQ) and the Symptom Checklist 90 (SCL-90). The MMQ (57 items) has three subscales representing self-appraisal of memory (MMQ contentment); perceived daily memory failures (MMQ ability); and the use of memory strategies (MMQ strategies). All of the MMQ scales are positively defined, meaning that a higher score indicates higher memory contentment, less daily memory failures and more daily memory strategy use (Troyer & Rich, 2002; Van der Werf & Vos, 2011). The SCL-90 is a clinical measure of psychological distress and divided into nine subscales. The SCL-90 total score is a reflection of general psychological distress (Derogatis, Lipman, & Covi, 1973).

Participants

Non-clinical population

The non-clinical population existed of 425 control participants (females = 295, males = 130). The majority of the data came from a control group of an internet survey where we compared memory complaints among the relatives of patients (N = 97) with a neurodegenerative disorder with those of participants who did not have a parent with a neurodegenerative disorder (N = 398). In addition, written PRMQ data were available from 27 control participants who had participated in two smaller projects assessing the relation between memory ratings and test performance. The mean age of the total sample was 40.02 (SD = 14.78) with a range of 18 to 89 years.

Clinical population

The PRMQ was sent together with the written appointment for a (neuro)psychological assessment to outpatients of a neurology clinic. These patients were referred by their clinicians, mostly neurologists but in some cases also other physicians, e.g. psychiatrists or rehabilitation physicians, from a university medical centre. All patients who had full PRMQ data were included in this study. The referral questions pertaining to this population were quite heterogeneous and reflected the mixed medical background of this neurology outpatient population. In total 217 (females = 82, males = 135) PRMQ questionnaires were collected. The mean age of this sample was 54.94 (SD = 13.87) with an age range of 19 to 85 years.

Results

Factor structure of the PRMQ

The combined data (N = 643) of both the patient and control groups were used for the structural equation modelling analyses. The analyses were carried out with AMOS (version 5). In line with Piauilino et al. (2010), we decided to limit the analyses to six

Table 1 Comparison of the fit indices of the different models that were tested in four language versions of the PRMQ

Models	Sample	Chi-square	df	RMSEA	SRMR	CFI
1. Unitary model	Dutch (N=643)	499.19	104	0.077	0.045	0.918
	Brazilian (N=664)	485.97	104	0.081	0.054	0.880
	Swedish (N=540)	360.70	104	0.062	0.048	0.910
	British (N=551)	407.20	104	0.073	0.057	0.890
2. Two factors, retrospective / prospective (uncorrelated)	Dutch	1091.88	104	0.122	0.289	0.796
	Brazilian	824.30	104	0.094	0.209	0.757
	Swedish	-	-	-	-	-
	British	732.40	104	0.105	0.268	0.780
3. Two factors, retrospective / prospective (correlated)	Dutch	434.47	103	0.071	0.042	0.931
	Brazilian	400.16	103	0.069	0.047	0.907
	Swedish	316.90	103	0.062	0.045	0.920
	British	336.10	103	0.064	0.053	0.920
4a. Tripartite model (complete)	Dutch	**257.95**	**88**	**0.055**	**0.028**	**0.965**
	Brazilian	**218.46**	**88**	**0.047**	**0.032**	**0.959**
	Swedish	**220.20**	**88**	**0.053**	**0.035**	**0.950**
	British	**245.40**	**88**	**0.057**	**0.044**	**0.950**
4b. Tripartite model (retrospective removed)	Dutch	372.09	96	0.067	0.039	0.942
	Brazilian	353.10	96	0.068	0.044	0.920
	Swedish	-	-	-	-	-
	British	306.30	96	0.060	0.047	0.930
4c. Tripartite model (prospective removed)	Dutch	380.25	96	0.068	0.036	0.941
	Brazilian	323.80	96	0.062	0.039	0.930
	Swedish	-	-	-	-	-
	British	288.80	96	0.063	0.050	0.930

Summary of the fit indices of the different structural models of the PRMQ in the Dutch, Brazilian (Piauilino et al., 2010), Swedish (Rönnlund et al., 2008) and British (Crawford et al., 2003) studies. The best fitting model is depicted in bold. Chi-square (smaller values indicate better fit); RMSEA (root mean square of approximation: good fit < 0.06; very good fit < 0.05); SRMR (standardised root mean square residual: good fit <0.08); CFI (comparative fit index: for a good fit > 0.95)

models and report the same fit indices and added our data into a table similar to the way they presented their data (Table 1). As in the previous studies, the best fitting model turned out to be the one with the tripartite structure.

Reliability of the PRMQ

Cronbach's alphas indicated high internal consistency for all scales within both samples. PRMQ total clinical $\alpha = .93$ and non-clinical $\alpha = .92$; PRMQ prospective clinical $\alpha = .83$, non-clinical $\alpha = .82$; PRMQ retrospective clinical $\alpha = .90$ and non-clinical $\alpha = .90$.

Influence of age and gender on PRMQ scores

With respect to the development of normative data we examined the relationships between the PRMQ scales and the demographic variables in the control group. Pearson product-moment correlation between scores on each of the scales and age and gender (females coded as 1, males coded as 0) were computed; the latter set of coefficients are termed point-biserial correlation coefficients.

There were small but significant correlations between age and the PRMQ total score ($r = .07$, $p = 0.15$), and the PRMQ retrospective score ($r = .11$, $p = 0.03$) but not with the PRMQ prospective subscale ($r = .03$, $p = 0.51$). The biserial correlation coefficients between gender and the PRMQ scales were also relatively small and only reached significance for the PRMQ prospective scale ($r = .12$, $p = 0.01$), and not for the PRMQ total ($r = .09$, $p = .06$) or PRMQ retrospective scores ($r = .04$, $p = 0.44$).

Validity assessment

To provide evidence for convergent validity we correlated the PRMQ subscales to the three subscales of the Multimodal Memory Questionnaire (MMQ) in our combined clinical and non-clinical sample ($N = 643$).

The PRMQ total scores turned out to have high and negative correlations with the MMQ ability ($r = -.88$, $p < .01$) and the MMQ contentment scales ($r = -.71$, $p < .01$). The PRMQ total scores were also positively correlated with the MMQ strategy scores ($r = .61$, $p < .01$).

The PRMQ prospective score showed high and negative correlations with the MMQ ability scale ($r = -.86$, $p < .01$) and the MMQ contentment scale ($r = -.68$, $p < .01$). The PRMQ total score correlated positively with the MMQ strategy scale ($r = .62$, $p < .01$).

The PRMQ retrospective score had high and negative correlations with the MMQ ability ($r = -.81$, $p < .01$) and the MMQ contentment ($r = -.67$, $p < .01$) scales. The PRMQ retrospective score correlated positively with the MMQ strategy scale ($r = .41$, $p < .01$).

A small part of our clinical sample ($N = 36$) had also filled out the SCL-90 psychopathology questionnaire and in this study the SCL-90 turned out to have significant correlations with the PRMQ total scores ($r = .58$, $p < .01$), the PRMQ prospective scores ($r = .53$, $p < .01$), and the PRMQ retrospective scores ($r = .56$, $p < .01$). The SCL-90 concentration subscale (items concerning perceived attention and memory weakness, indecisiveness etc.) correlated highest with the PRMQ scales: total ($r = .72$, $p < .01$), prospective ($r = .66$, $p < .01$), and retrospective ($r = .71$, $p < .01$). The SCL-90 subscale Hostility (items referring to losing temper, irritability etc.) correlated lowest with the PRMQ scales: PRMQ total ($r = .16$, $p = .37$), PRMQ prospective ($r = .14$, $p = .42$) and PRMQ retrospective ($r = .16$, $p = .36$).

In order to test whether the PRMQ could differentiate between a clinical and a non-clinical sample, the three PRMQ scale scores of the clinical and non-clinical sample were compared by 2 x 2 ANCOVAs, with group and gender as independent variables and age as covariate. Table 2 depicts the mean PRMQ values and standard deviations for both groups.

Age was not significantly related to the PRMQ total score ($F(1,642) = 1.00$, $p = .31$, partial $\hat{\eta}^2 = .002$). There was no significant interaction effect between

Table 2 Mean PRMQ scores and standard deviations of the non-clinical and clinical samples and intercorrelations within the non-clinical group

	Intercorrelations (Rho) in the non-clinical group (N=425)		Non-clinical group (N=425)	Clinical group (N=218)
PRMQ scores	Prospective	Retrospective	Mean (SD)	Mean (SD)
Total scale	0.95	0.93	30.51 (9.56)	34.00 (11.35)
Prospective scale		0.78	16.20 (5.50)	17.75 (6.48)
Retrospective scale			14.31 (4.63)	16.26 (5.55)

PRMQ = Prospective Retrospective Memory Questionnaire

group and gender ($F(1,642) = 0.68$, $p = .41$, partial $\acute{\eta}^2 = .001$). The clinical group had higher PRMQ total scores than the control group ($F(1,642) = 15.07$, $p < .01$, partial $\acute{\eta}^2 = .023$) and women reported higher PRMQ total scores ($F(1,642) = 8.75$, $p < .01$, partial $\acute{\eta}^2 = .014$).

Age was not significantly related to the PRMQ prospective score ($F(1,642) = 0.31$, $p = .86$, partial $\acute{\eta}^2 = .000$). There was no significant interaction effect between group and gender ($F(1,642) = 0.49$, $p = .48$, partial $\acute{\eta}^2 = .001$). The clinical group had higher PRMQ prospective scores than the control group ($F(1,642) = 14.41$, $p < .001$, partial $\acute{\eta}^2 = .022$) and women reported higher PRMQ prospective scores ($F(1,642) = 13.16$, $p < .001$, partial $\acute{\eta}^2 = .020$).

Age was significantly related to the PRMQ retrospective score ($F(1,642) = 5.16$, $p = .23$, partial $\acute{\eta}^2 = .008$). There was no significant interaction effect between group and gender ($F(1,642) = 0.77$, $p = .38$, partial $\acute{\eta}^2 = .001$). The clinical group had higher PRMQ retrospective scores than the control group ($F(1,642) = 12.40$, $p < .001$, partial $\acute{\eta}^2 = .019$) and there was no significant gender effect (F (1,642) $= 3.31$, $p = .07$, partial $\acute{\eta}^2 = .005$). The T-test analyses confirmed the differences between the two groups (PRMQ retrospective: $t = 4.60$, df (640), $p < .001$; PRMQ prospective: $t = 3.10$, df 640, $p = .002$).

Normative data

In our non-clinical sample, the three PRMQ subtest scores had non-normal distributions: PRMQ total scores, $D(425) = 0.15$, $p < .001$, PRMQ prospective scores, $D(425) = 0.16$, $p < .001$, and PRMQ retrospective scores, $D(425) = 0.15$, $p <$ .001. The distributions of all PRMQ scale scores were positively skewed (z-scores skewness: PRQM total: 13.1, PRMQ retrospective: 11.6 and PRMQ prospective: 13.3). The PRMQ raw scores departed from a normal distribution; therefore, we decided to convert the raw scores into percentiles. Since both age and gender effects were small and we did not want to reduce our sample sizes on which norms would be based too much, it was decided not to stratify for different gender or age groups.

Tables 3A to 3C depict the percentile ranks for each raw score of the three PRMQ scales. As recommended by Crawford et al. (2009), percentile scores were defined as the percentage of scores that fall below the score of interest, where half of those obtaining the score of interest are included in the percentage. Furthermore, in the present study the point estimates of the percentile ranks were accompanied with 95% confidence intervals. These confidence intervals were calculated according to a Bayesian estimating method with software accompanying the paper of Crawford et al. (2009).

We compared the cut-off scores (5%) of our PRMQ data to that of the cut-off scores (T-score ≤ 33) of both the Crawford et al. (2002) and Rönnlund et al. (2008) studies. Since the Rönnlund et al. study provided data for different age brackets, we estimated a general cut-off based on the four age groups. The following cut-off scores were found for the three PRMQ measures: PRMQ total cut-off score Van der Werf = 49, Rönnlund = 49/50, and Crawford = 55; PRMQ prospective cut-off scores Van der Werf = 27/28, Rönnlund = 28/29, and Crawford = 27; PRMQ retrospective cut-off scores Van der Werf = 23/24, Rönnlund = 24, and Crawford = 28/29. Our cut-off points resembled most closely those of the Rönnlund study.

Table 3A Percentile estimates for the PRMQ-total scores (n=425)

PRMQ total Raw scores	Percentile estimates	95% Confidence interval	
		Min	Max
16	0.2	0.0	1.2
17	0.7	0.2	2.0
18	1.4	0.5	3.1
19	2.5	1.1	4.5
20	4.7	2.3	7.9
21	8.0	5.2	12.0
22	14.0	8.9	18.8
23	20.0	15.0	24.5
24	26.0	20.2	32.0
25	32.0	26.8	37.0
26	38.0	31.8	45.4
27	46.0	40.1	51.5
28	51.0	45.2	55.9
29	55.0	49.5	60.1
30	60.0	54.0	65.3
31	64.0	59.2	69.2
32	68.0	62.9	72.6
33	71.0	66.4	75.7
34	74.0	69.2	78.0
35	76.0	71.3	79.7
36	78.0	73.2	81.5
37	80.0	75.5	83.6
38	82.0	78.1	86.0
39	84.0	80.6	87.9
40	86.0	82.2	88.9
41	87.0	83.0	89.6
42	88.0	84.5	91.2
43	90.0	86.3	92.2
44	90.0	87.2	93.0
45	92.0	88.7	94.6
46	93.0	90.7	95.5

Table 3A Percentile estimates for the PRMQ-total scores (n=425)

PRMQ total Raw scores	Percentile estimates	95% Confidence interval	
		Min	Max
47	94.0	91.0	95.7
48	94.0	91.5	96.1
49	95.0	92.3	96.5
50	95.0	92.5	96.7
51	95.3	92.9	97.0
52	95.8	93.5	97.4
53	96.1	93.9	97.7
54	96.6	94.5	98.1
55	97.1	95.1	98.4
56	97.5	95.6	98.8
57	98.0	96.3	99.0
58	98.2	96.6	99.2
59	98.2	96.8	99.3
60	98.4	96.8	99.3
61	98.5	96.9	99.4
62	98.8	97.4	99.6
63	99.1	97.8	99.7
64	99.1	97.8	99.7
65	99.1	97.8	99.7
66	99.1	97.8	99.7
67	99.1	97.8	99.7
68	99.2	97.9	99.8
69	99.5	98.4	99.9
70	99.8	98.9	100.0
71	99.8	98.9	100.0
72	99.8	98.9	100.0
73	99.8	98.9	100.0
74	99.8	98.9	100.0
75	99.8	98.9	100.0
76	99.8	98.9	100.0
77	99.8	99.1	100.0
78	100.0	99.4	100.0
79	100.0	99.4	100.0
80	100.0	99.4	100.0

Table 3B Percentile estimates for the PRMQ retrospective memory scores (n=425)

PRMQ retrospective Raw scores	Percentile estimates	95% Confidence interval	
		Min	Max
8	1.5	0.0	4.1
9	5.0	2.5	9.2
10	12.0	6.9	18.1
11	23.0	15.4	30.6
12	36.0	27.5	44.6
13	48.0	40.7	55.1
14	58.0	50.7	64.7
15	67.0	60.2	72.9
16	74.0	68.3	79.3
17	79.0	74.6	83.8
18	83.0	78.8	86.6
19	86.0	81.8	89.4
20	89.0	85.2	91.1
21	91.0	88.0	93.8
22	93.0	89.9	95.3
23	94.0	91.8	96.5
24	95.4	93.0	97.2
25	95.9	93.7	97.5
26	96.6	94.4	98.2
27	97.6	95.7	98.9
28	98.4	96.7	99.3
29	98.9	97.5	99.7
30	99.3	98.1	98.8
31	99.3	98.1	99.8
32	99.4	98.3	99.9
33	99.5	98.5	99.9
34	99.5	98.5	99.9
35	99.6	98.6	100.0
36	99.8	98.9	100.0
37	99.8	98.9	100.0
38	99.8	98.9	100.0
39	99.9	99.1	100.0
40	100.0	99.4	100.0

Table 3C Percentile estimates for the PRMQ prospective memory scores (n=425)

PRMQ prospective Raw scores	Percentile estimates	95% Confidence interval	
		Min	Max
8	0.6	0.0	2.1
9	2.5	0.8	5.0
10	6.0	3.1	10.0
11	12.0	7.5	17.9
12	21.0	14.8	26.9
13	31.0	23.4	38.4
14	42.0	34.4	49.0
15	51.0	44.5	58.3
16	60.0	53.6	67.1
17	68.0	62.3	73.7
18	74.0	68.5	78.5
19	77.0	72.6	80.9
20	80.0	75.1	83.8
21	83.0	78.7	86.7
22	86.0	81.8	89.0
23	88.0	84.2	90.8
24	90.0	86.4	92.8
25	92.0	88.8	94.4
26	93.0	90.4	95.4
27	94.0	91.6	96.3
28	95.5	93.0	97.4
29	96.6	94.5	98.1
30	97.4	95.4	98.7
31	98.0	96.3	99.0
32	98.2	96.6	99.2
33	98.5	96.9	99.4
34	98.7	97.2	99.5
35	98.9	97.6	99.6
36	99.3	98.0	99.8
37	99.5	98.5	99.9
38	99.6	98.6	100.0
39	99.8	98.9	100.0
40	99.9	99.1	100.0

Discussion

The PRMQ data of the Dutch translation were best fitted to the tripartite model confirming the results of previous studies. Moreover, the fit indices of the competing models closely resembled those of the British, Swedish and Brazilian data. These findings illustrated again the cross-cultural robustness of the underlying structure of the PRMQ and the proposition that prospective and retrospective memory share an underlying common memory factor.

In both the clinical and non-clinical samples, the internal consistency measures for the PRMQ total and the two subscales were adequate (all > 0.80) and resembled those of previous studies and translations.

The normative data suggested that the influences of gender and age were rather small. The correlations between the PRMQ scores and age resembled those reported in the Crawford et al. (2003) study. Moreover, gender accounted for maximally 1.4% of the variance in the PRMQ scores, while the Crawford et al. study reported a 1.3%. These small demographic effects did not seem to be specific for the PRMQ. We found similar results in our MMQ normative study (Van der Werf & Vos, 2011).

The mean PRMQ scores were somewhat lower than those of the original Crawford study. This perhaps indicates that cultural differences do not affect the underlying structure of the PRMQ, but might influence the interpretation of the severity scale. Alternatively, one could argue that our Internet survey might have biased our sample to a relatively more active functioning and cognitively more able group. However, our website survey targeted the general population and did not explicitly exclude people with psychiatric or neurological co-morbidity. One could therefore also argue that these types of complaint surveys might attract people who experience problems. However, when we compared our data with another Swedish study that reviewed PRMQ scores of 105 self-reporters of memory problems with a group of 92 non-self reporters with a similar mean age (mean 42.4 years) to our non-clinical group, we noticed that the PRMQ scores of the comparison group matched quite closely to those of our non-clinical group, the mean PRMQ total score being 29.8 in the Swedish study compared with 30.5 in our study (Mantyla, 2003). In addition, both our data and those of the Mantyla study closely resembled the previously mentioned Rönnlund et al. (2008) study.

Our validity data showed good convergent validity with a different validated memory questionnaire and with the 'most' cognitive subscale of the SCL-90 distress measure. The divergent validity was demonstrated by the low correlation with the hostility subscale of the SCL-90. The clinical group had, as one would expect, higher PRMQ scores compared with the non-clinical group. The effect sizes, however, were small (partial eta's ranged between .019 and -.022). This could be explained by the heterogeneous character of our clinical sample. We did not specifically target patients with memory complaints and, in contrast to the original PRMQ study, the PRMQs of our memory-impaired patients were not rated by caregivers but by the patients themselves, some of whom might have had signs of

anosognosia. When we compared the PRMQ data with those of the MMQ, we found that the difference between the clinical and the non-clinical sample of the report of memory failures (MMQ ability) amounted to approximately one standard deviation, compared with only one third of a standard deviation difference for the PRMQ total score. One might therefore conclude that the MMQ is a more sensitive measure for memory failures, or that the MMQ is more sensitive for bias, e.g. distress. We were not convinced by this last proposition since both the MMQ ability and PRMQ total scores showed comparable correlations with psychological distress as measured by the SCL-90 (Van der Werf & Vos, 2011).

When we reviewed some other comparative clinical studies that were carried out with the PRMQ, we noticed that the findings were quite heterogeneous and that the largest group differences ranged between half to a maximum of one standard deviation. Patients with chronic fatigue syndrome, for example, reported significantly more retrospective and prospective memory failures than age- and IQ-matched controls, with effects approximating one standard deviation (Attree, Dancey, & Pope, 2009). Bruce, Bruce, Hancock, and Lynch (2010) found a similar effect size when they compared 79 patients with multiple sclerosis to 20 age- and education-matched controls. Patients with Parkinson's disease reported significantly more self-cued prospective memory failures compared with age-matched healthy controls, with an effect size of approximately one standard deviation. When we aggregated the PRMQ subtest scores that were published in this study into estimates of the PRMQ total score, the difference between both groups was again between 0.5 and 1 standard deviation (Foster, McDaniel, Repovš, & Hershey, 2009)
An alternative measure for the sensitivity of the PRMQ might be its capacity to detect change. By comparing pre- and post-PRMQ scores and their confidence intervals, one could judge whether there is significant change over time or after an intervention. However, in order to detect meaningful change over time or after an intervention, one ought to have test-retest data. Regrettably, up till this moment our study and the PRMQ studies that we have already mentioned cannot provide such data. For the time being, the reported Cronbach's alphas might be used as estimates of test-retest reliability in order to calculate confidence interval for the true scores.

The PRMQ seems particularly suitable to collect such data since it is concise with relatively short statements. In our experience, most patients were able to complete the PRMQ within 5 minutes; this is in contrast to the far lengthier (57 items) MMQ that normally takes 10-15 minutes. Although approximately half of the items of MMQ efficacy subscale seem to correspond to types of prospective memory failures, this distinction has not been tested and confirmed as has been done with the PRMQ. Although the PRMQ lacks items with respect to self-appraisal of memory or memory strategy use, its balanced division in prospective and retrospective memory failures, its few and to-the-point items, and the good cross-cultural psychometric properties, might make it the preferred choice for relatively quick but reliable screenings of the severity of memory complaints in a research context. Moreover, in a clinical context the PRMQ might also be a preferred measure to evaluate the perceived efficacy of memory strategy interventions which often specifically target prospective memory failures.

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