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The Memory Functioning Questionnaire for Assessment of Memory Complaints in Adulthood and Old Age

Michael J. Gilewski
Department of Veterans Affairs Outpatient Clinic, Los Angeles
and University of Southern California

Elizabeth M. Zelinski
School of Gerontology
University of Southern California

K. Warner Schaie
Department of Individual and Family Studies
Pennsylvania State University

The results of psychometric analyses of the Metamemory Questionnaire (MQ; Zelinski, Gilewski, & Thompson, 1980), developed to evaluate perception of everyday memory functioning, are presented for a sample of 343 men and 435 women aged 16 to 89. Exploratory factor analysis yielded 4 correlated factors—General Frequency of Forgetting, Seriousness of Forgetting, Retrospective Functioning, and Mnemonics Usage—which accounted for 36.7% of the variance in responses to the MQ. Factor structure was invariant across age groups (16–54 vs. 55–89 years), 2 independent samples, and over 3 years. Because some of the original MQ scales did not load on the factors, only 64 of the original 92 items were retained for inclusion in the Memory Functioning Questionnaire (MFQ). Internal consistency of MFQ scores is high. The MFQ is therefore reliable for evaluating memory self-appraisals.

How people, and older adults in particular, appraise their ability to remember has become a question of interest for researchers studying metacognition, that is, awareness of cognitive functioning (e.g., Hultsch, Hertzog, Dixon, & Davidson, 1988). Self-perception of memory has a modest correlation with performance on memory tasks in some studies (e.g., Larrabee & Levin, 1986; Zelinski, Gilewski, & Anthony-Bergstone, 1990). It may therefore reflect to a limited extent self-awareness of memory declines (Erickson & Howieson, 1986), or, because of its interplay with the individual's sense of self-efficacy (Berry, 1986), self-perception of memory may affect expectations, use of mnemonic strategies or effort to remember, and hence, memory performance (Bandura, 1986).

Self-appraisal of memory functioning is also moderately correlated with affective state, in that memory complaints (negative self-appraisals) are more likely to occur in depressed individuals (e.g., Kahn, Zarit, Hilbert, & Niederehe, 1975; Larrabee & Levin, 1986). Depression, in turn, has been associated in some studies with memory performance deficits (e.g., Williams, Little, Scates, & Blockman, 1987). Two studies have also reported that health problems are associated with higher levels of memory complaints (Cutler & Grams, 1988; Tun, Perlmuter, Russo, & Nathan, 1987). Although the causal directions of the relationships among memory self-appraisal, affect, health, and memory performance have not been determined, these factors probably interact with each other in complex ways. Thus, although memory self-appraisal is not veridical with respect to performance, the consistency of relationships among these variables suggests that it is important in assessment of memory, for clinical purposes and for basic cognitive research, because older adults in the general population are more likely to experience symptomatic depression and chronic health problems (e.g., Gallagher, Thompson, & Levy, 1980).

Several instruments for the self-appraisal of memory ability have been developed; the most widely used ones in the literature on aging are the Metamemory in Adulthood (MIA) questionnaire (Dixon & Hultsch, 1984) and the Metamemory Questionnaire (MQ; Zelinski, Gilewski, & Thompson, 1980).

More extensive psychometric data have thus far been reported for the MIA than for the MQ. The MIA questionnaire investigates several constructs, including use of memory strategies (Strategy scale), knowledge of memory tasks and processes (Task scale), memory and state anxiety (Anxiety scale), achievement motivation and memory (Achievement scale), awareness of change in memory (Change scale), knowledge of one's own memory capacity (Capacity scale), and locus of control in memory abilities (Locus scale; Dixon & Hultsch, 1983). The MIA has been factor analyzed, with mixed results as to whether scales load on separate factors representing memory self-efficacy (self-appraisal) and knowledge about the phenomena underlying memory performance in general or whether separate factors for strategy, affect, and change emerge (Hertzog, Dixon, Schulenberg, & Hultsch, 1987; Hertzog, Hultsch, & Dixon, 1989).

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Correspondence concerning this article should be addressed to Michael J. Gilewski, who is now at Cedars-Sinai Medical Center, Schulman 215—PM & R, 8700 Beverly Boulevard, Los Angeles, California 90048.

The MQ (Zelinski et al., 1980), on the other hand, is more narrow in scope. It consists of 92 items requiring 7-point Likert scale judgments on various aspects of everyday remembering and forgetting. Responses to the MQ are summarized in nine a priori scale scores: General Rating of Memory, Reliance on Memory, Retrospective Functioning, Frequency of Forgetting, Frequency of Forgetting When Reading, Remembering Past Events, Seriousness of Memory Failures, Mnemonics Usage, and Effort to Remember.

The MQ was designed to examine individual differences in constructs similar to those assessed by the MIA Strategy, Change, and Capacity scales. Indeed, a study examining the convergent validity of the Memory Functioning Questionnaire (MFQ) and MIA scales indicated that there is one factor with excellent convergence for both instruments based on MIA Self-Efficacy and MFQ Frequency of Forgetting scales and two additional factors with good convergence, one based on MIA Strategy and MFQ Mnemonics Usage scales and another based on MIA Change and MFQ Retrospective Functioning scales (Hertzog et al., 1989).

The MQ has been used to investigate several major questions on the usefulness of assessing self-appraisals of memory functioning. Studies from laboratories independent of ours have reported relationships between MQ scales and depression (Blau, 1986; O'Hara, Hinrichs, Kohout, Wallace, & Lemke, 1986; Popkin, Gallagher, Thompson, & Moore, 1982; Williams et al., 1987) and in several cases between MQ scales and performance on some memory tasks (Blau, 1986; Williams et al., 1987).

The purpose of this article is to report on the results of a series of psychometric analyses aimed at refining the MQ. We have observed that some characteristics of the MQ require additional psychometric analysis, because there are few independently published data on the reliability and validity on this scale, except for the factor analyses reported by Hertzog et al. (1989) and an internal consistency of 0.70 for 8 of the 18 items from the Frequency of Forgetting scale reported by O'Hara et al. (1986). Furthermore, different investigators have used different MQ scales in their work, and most have used only several of the scales. We assume that they have done this because of the excessive length of the MQ and because the scales cannot simply be summed into a total score; earlier analyses on the MQ indicated that it is multidimensional (Zelinski et al., 1980). Finally, we wanted to determine whether a reduced version of the MQ involves a unidimensional construct of memory self-appraisal or multiple dimensions, as Hertzog et al. (1989) have suggested.

We conducted psychometric analyses on the MQ with the goal of reducing its length and identifying the factor structure and stability of a shortened version of the MQ. The results are reported in this article. Norms on the factor scores obtained from these analyses for the revised MQ through adulthood and old age are also provided.

Method

Subjects

Participants in the main study completed the 92-item Metamemory Questionnaire as part of a larger study of adult mental abilities (Schaie, 1985). The sample consisted of 343 men and 435 women recruited from university and community college students and staff, community volunteers, and members of a health maintenance organization (HMO). Subjects ranged in age from 16 to 89 years (M = 56.9, SD = 20.8), averaged 13.3 years of education (SD = 3.0), were of moderate socioeconomic status (SES; M = 4.9, SD = 2.0) on a scale of 0 (*unskilled*) to 9 (*professional*), averaged 4.1 (SD = 2.2) on an income scale of 1 (*under $4,000*) to 8 (*$28,000+*), and were in good health (M = 7.5, SD = 1.9) on a scale of 1 (*very poor*) to 10 (*excellent*).

A sample of subjects recruited from the HMO, 124 men and 140 women, were tested at the same time as the main group of 778 subjects but also returned for retesting 3 years later on the mental abilities battery. (These subjects' data were not included in analyses with those of the larger sample.) The subjects in the longitudinal sample were administered the MQ again on retest. At the first time of testing, the 264 adults ranged in age from 29 to 87 (M = 64.4, SD = 13.4). Although this sample was on average somewhat older at the initial test than was the main sample, the demographic characteristics of those at retest were representative of the entire sample at Time 1 (education, M = 13.4, SD = 3.1; SES, M = 5.0, SD = 2.1; income, M = 4.4, SD = 2.5; and health, M = 7.4, SD = 1.7).

Data from the 778 persons in the main sample, who were not retested, were used for the exploratory factor analysis, and data from the 264 subjects from the longitudinal sample were used in the confirmatory factor analysis. For analyses to be parallel, except where indicated later, the subject samples included men and women of varying age ranges.

Data Analysis

Although we desired to keep as much of the a priori organization of the MQ as possible, our primary concern was to reduce the data. Therefore, we conducted an exploratory factor analysis of the 92 MQ items (SPSS-X; SPSS, Inc., 1986) to eliminate redundant items. To do this, principal-axis factoring was used.

The optimal number of factors (principal components) was determined by using the scree test on eigenvalues greater than 1 (Cattell, 1966). An oblique (OBLIMIN) rotation was performed to enhance interpretation and to permit correlations between factors. Factor loadings were considered significant if they were at least 0.35. Items not significantly loading on any of the resultant factors were dropped. The shortened version of the MQ was renamed the Memory Functioning Questionnaire (MFQ).

Results

Factor Structure

Examination of the eigenvalues suggested that a four-factor solution was optimal. The results are summarized in Table 1, which lists the descriptive data for all items with loadings of 0.35 or more. (Some of the items with salient loadings included in Table 1 were later dropped from the shortened version of the MQ for conceptual reasons.)

Even though the 92 MQ items were entered into analysis as individual scores, those from the same a priori scales loaded together. This probably indicates that items within given a priori scales are measuring the same latent variable.

A few MQ items did not significantly load on any factor; these were three items from the Reliance on Memory scale, two items each from the Remembering Past Events and Mnemonics Usage scales, and one from Retrospective Memory Functioning. The items from the Effort to Remember scale were the

Table 1
Summary of Principal Factors Analysis on the Metamemory Questionnaire

Scale	Total no. items	Significant factor loadings[a]						Communalities	
		Factor[a]							
		1	2	3	4	*M*	Range	*M*	Range
General Rating	1	1	0	0	0	.37	—	.18	—
Reliance on Memory	5	0	0	2	0	.39	.36–.39	.07	.04–.09
Retrospective Functioning	6	0	0	5	0	−.75	−.43–−.80	.57	.26–.67
Frequency of Forgetting	18	18	0	0	0	.48	.35–.61	.29	.16–.42
Frequency of Forgetting During Reading	10	10	0	0	0	.77	.63–.84	.52	.40–.59
Remembering Past Events	6	4	0	0	0	.51	.48–.64	.40	.28–.47
Seriousness of Forgetting	18	0	18	0	0	−.69	−.47–−.80	.49	.34–.58
Mnemonics Usage	10	0	0	0	8	.55	.48–.67	.33	.23–.46
Effort to Remember	18	10	0	0	0	.41	.37–.60	.34	.19–.45

Note. Communalities are provided for all items of the reliance and effort scales but only for items with significant factor loadings for all other scales.
[a] Values indicate the number of items loading significantly on each factor.

least likely to load on the factor structure: Eight items failed to load on any factor, and the remaining 10 had significant loadings on Factor 1. The mean factor loadings for the effort scale items that were significant were 0.41 and were lower than mean loadings from any other MQ scale. The two salient loadings from the Reliance on Memory scale also had relatively low mean factor loadings. Because of the minimal contribution of individual items from the effort and Reliance on Memory scales to the factor solution, relative to the other scales, they were dropped from the MFQ. A second reason for dropping those items was that they did not conceptually relate well to the interpretations of the latent variables underlying the MFQ factors (see later text).

The remaining MQ items with nonsignificant factor loadings were also deleted, yielding 64 items composing the MFQ (see the Appendix). Factor 1 had 33 of the 64 MFQ items loading on it. It was interpreted as a General Frequency of Forgetting factor because all but 1 item loading on it involved appraising how frequently the individual perceived forgetting to occur. The General Frequency of Forgetting scale comprised items from the General Rating, Frequency of Forgetting, Frequency of Forgetting When Reading, and Remembering Past Events scales of the MQ and accounted for 23.7% of the variance in responses (eigenvalue = 21.81). Mean factor loadings for items on the individual scales were computed by transforming factor pattern loadings with Fisher's transformation, calculating the mean, and then retransforming them from z to r.

The reading items had the highest factor loadings overall ($M = 0.77$), and as seen in Table 1, the communalities from the principal-factor analysis ranged from 0.40 to 0.59, indicating that up to 59% of the variance in those items was accounted for by the four principal factors. Mean salient item loadings for the other scales were about 0.50. The one exception was the single item of the General Rating scale, which had a loading of 0.37 and a communality of 0.18.

Factor 2, Seriousness of Forgetting, consisted of the 18 items from the Seriousness of Forgetting scale and accounted for 5.7% of the variance in MQ responses (eigenvalue = 5.23). The mean loading for items on this factor was −0.69 over the 18 items, and the mean communality of items with the factor solution was 0.49.

Factor 3 was named Retrospective Functioning because only items from the Retrospective Functioning scale were included for the MFQ. The mean loading for items on this factor was −0.75, with a mean communality of 0.57. The Retrospective Functioning factor accounted for 4.0% of the variance (eigenvalue = 3.72).

The fourth factor, Mnemonics Usage, consisted of items from the Mnemonics Usage scale and accounted for 3.2% of the variance in MQ responses (eigenvalue = 2.91). The mean loading was 0.55, and communalities ranged from 0.23 to 0.46, with a mean of 0.33.

The four principal factors accounted for 36.7% of the variance in the responses to the MQ. Although the oblique solution allowed for interfactor correlations, the only substantial correlation among factors was between General Frequency of Forgetting and Seriousness of Forgetting (−0.47), as shown in the first matrix of Table 2.

Age Patterns in MQ Factors

To evaluate whether there were age differences in the factor pattern and structure of the MQ items, responses to the MQ were refactored separately for younger (aged 16–54) and older (aged 55–89) respondents. Although it can be argued that the age ranges are wide (spanning 38 and 33 years for young and old, respectively), the number of subjects for the younger group precluded alternative divisions for stable factor analysis results. Because confirmatory factor analysis using all 92 items was not possible (solutions would be underidentified because of the substantial number of free parameters), the factor analyses were exploratory, using principal-axis factoring and oblique rotations.

For the young sample ($n = 191$), all but five items (three from the Frequency of Forgetting scale, one from Seriousness of Forgetting, one from Mnemonics Usage) loaded significantly on the same factors as on the solution for the total sample. For the older sample ($n = 587$), the items loading significantly were

Table 2
Factor Intercorrelations

Factor	1	2	3	4
Total sample				
1. General Frequency of Forgetting	1.00			
2. Seriousness of Forgetting	−.47	1.00		
3. Retrospective Functioning	.27	−.21	1.00	
4. Mnemonics Usage	.21	.14	−.15	1.00
Young subsample				
1. General Frequency of Forgetting	1.00			
2. Seriousness of Forgetting	−.39	1.00		
3. Retrospective Functioning	.05	−.05	1.00	
4. Mnemonics Usage	.11	−.08	−.05	1.00
Older subsample				
1. General Frequency of Forgetting	1.00			
2. Seriousness of Forgetting	−.45	1.00		
3. Retrospective Functioning	.29	−.21	1.00	
4. Mnemonics Usage	.19	−.09	.17	1.00
Independent sample of older adults—initial testing				
1. General Frequency of Forgetting	1.00			
2. Seriousness of Forgetting	.42	1.00		
3. Retrospective Functioning	.12	.04	1.00	
4. Mnemonics Usage	.23	.15	.09	1.00
Independent sample of older adults—longitudinal testing				
1. General Frequency of Forgetting	1.00			
2. Seriousness of Forgetting	.35	1.00		
3. Retrospective Functioning	−.32	−.07	1.00	
4. Mnemonics Usage	.11	.13	−.17	1.00
Confirmatory maximum likelihood estimates				
1. General Frequency of Forgetting	1.00			
2. Seriousness of Forgetting	−.72	1.00		
3. Retrospective Functioning	−.25	−.13	1.00	
4. Mnemonics Usage	.45	−.44	−.25	1.00

identical to those for the entire sample. For the older group, the factors were extracted in the same order as for the total sample. This was also true for the young group, except that Mnemonics Usage and Retrospective Functioning were extracted third and fourth, respectively. The four factors accounted for 34% of the variance in MQ responses of young adults and for 38.3% in the responses of older adults. Table 3 presents the mean loadings for items on each of the factors for the entire sample as well as for young and older groups. The loadings were lower for the younger group only on Retrospective Functioning. Their absolute values were otherwise virtually identical. The second and third matrices shown in Table 2 give the factor intercorrelations for each sample. The patterns of intercorrelations are similar, with the largest correlations between the first 2 factors.

To verify our interpretation that the structure of the MFQ does not differ significantly by age, we analyzed the covariance matrices for the summed responses to the MFQ scales for the two age groups using the LISREL VI program (Jöreskog & Sörböm, 1983). There were no reliable age differences, $\chi^2(36) = 34.16$, $p = .55$. This suggests that the factor structure of the MFQ is invariant over age, confirming the findings of Hertzog et al. (1989).

Longitudinal Analyses of the MFQ

It is also important to verify that the MFQ's factor structure is invariant over samples. Data from the 264 subjects participating longitudinally were analyzed. As in the previous item analyses for the young and older groups, confirmatory factor analysis with the original items would produce a severe underfit to the data. Instead, two approaches to examining stability of the MFQ were used. First, the 64 MFQ items were refactored with principal-axis methods and rotated with OBLIMIN procedures. Next, scores on the eight MFQ scales (responses to items summed within scales) were subjected to a confirmatory factor analysis.

The analysis involving MFQ items for the longitudinal sample at initial testing and 3 years later indicated that the absolute values of mean factor loadings for items within scales were virtually identical to those obtained for the main sample, as seen in Table 3, as were the factor intercorrelations seen in the fourth and fifth matrices of Table 2. The 64 items loaded on the identical factors as in the main analysis, and all had significant loadings. Thus, there is no evidence that any of the 64 items composing the MFQ should be eliminated.

A confirmatory factor analysis was conducted with the scores on the MFQ scales from the initial testing of the longitudinal sample, with communalities, factor loadings, and intercorrelations constrained to those of the original sample to determine whether the factor structure of the MFQ was invariant over samples. The initial confirmatory model was not a good fit, $\chi^2(36) = 177.28$, $p < .0001$, goodness of fit = 0.818, root mean square residual = 0.188. (The goodness-of-fit index should be close to 1.0, indicating a perfect fit, and the root mean square of the residual matrix should approach 0.) A subsequent model allowed the off-diagonal factor correlations to vary, along with two factor loadings (for the Frequency of Forgetting and Remembering Past Events scales), and was a better fit, $\chi^2(28) = 74.61$, $p < .0001$, goodness of fit = 0.936, root mean square residual = 0.063. A final model also allowed the two communalities for Frequency of Forgetting and Remembering Past Events factors to vary. The fit was acceptable, $\chi^2(28) = 39.93$, $p < .04$, goodness of fit = 0.964, root mean square residual = 0.041. As shown in Table 3, the mean maximum likelihood factor loadings were quite similar to those of the exploratory analysis, and although the off-diagonal factor correlations shown in the last matrix of Table 2 were higher than in the prior analyses, the pattern of relative correlation between factors was identical. It is thus clear that the factor structure of the MFQ scales is invariant.

Stability Analyses

The stability of the MFQ was evaluated by testing whether the covariance matrices of the scales comprising the factor scores differed longitudinally. This analysis, conducted with LISREL VI, indicated that the covariance matrices did not differ significantly, $\chi^2(26) = 35.48$, $p = .49$, and that the goodness of fit of the comparison was 0.985.

Table 3
Mean Factor Loadings (Salient Items Only) for Each Analysis

Measure	Factor			
	General Frequency of Forgetting	Seriousness of Forgetting	Retrospective Functioning	Mnemonics Usage
Total sample	.58	−.69	−.75	.55
Young (16–54 years)	.49	−.68	.56	.47
Old (55–89 years)	.57	−.68	.73	.61
Independent sample of older adults—initial testing	.60	.67	.83	.62
Independent sample of older adults—longitudinal testing	.57	.66	−.79	.62
Confirmatory factor analysis[a]	.72	−.67	−.75	.55

[a] Mean loadings are based on total scores for scales loading on each factor rather than on individual items.

Internal Consistency in MFQ Scores

Based on the 64 items, the internal consistency estimates (Cronbach's alpha) for the four factor scores were .94, .94, .89, and .83, indicating that the factors are highly reliable.

To simplify the computation of the MFQ factor scores, unit weights for responses to each item were used. Where factor loadings were negative (Seriousness of Forgetting and Retrospective Functioning factors), the sign was reversed so that all scores were positive. Thus, subjects' scores were summed across the items and scales loading on each factor. The correlations of each unit factor score with the regression factor scores computed from the initial exploratory analysis are reported in Table 4. Note the nearly perfect intercorrelations on the diagonal, the symmetry of absolute values, and the relatively high correlation between General Frequency of Forgetting and Seriousness of Forgetting factor scores, reflecting the factor intercorrelations.

Results for the unit factor scores broken down by age group are shown in Table 5. There were no sex differences on the scores, as determined by multivariate analysis of variance, so descriptive statistics were collapsed across sex. To simplify comparisons of scores across the four factors, we computed *z* scores based on the entire sample, as well as the raw scores, which can be converted to mean ratings.

Relationships Between Subject Background Variables and MFQ Scores

Because of the potential interaction of age with the demographic characteristics of subjects, we wanted to rule out age differences in MFQ scores that might better be accounted for by other variables. Results of stepwise multiple regressions on the four unit factor scores, with self-reported health ratings on a scale of 1 to 10 (10 = *excellent*), number of years of schooling, and age, are summarized in Table 6.

Age accounted for small but significant amounts of variance in two of the four MFQ factor scores (R^2 = .06 and .03). Older subjects had more negative assessments (lower scores) on the General Frequency of Forgetting and Retrospective Functioning factors than younger subjects had. Better health ratings were related to higher scores on General Frequency of Forgetting and Seriousness of Forgetting factors. Education accounted for significant variance for the Mnemonics Usage, with greater education associated with more use of mnemonics.

Table 4
Correlations of Regression Factor Loadings With Unit Weight Factor Loadings

Regression factor	Unit weight factor scores			
	General Frequency of Forgetting	Seriousness of Forgetting	Retrospective Functioning	Mnemonics Usage
General Frequency of Forgetting	.97	.47	.20	.20
Seriousness of Forgetting	−.48	−.98	−.12	−.17
Retrospective Functioning	−.29	−.14	−.93	−.24
Mnemonics Usage	.30	.21	.12	.87

Table 5
Statistics for Memory Functioning Questionnaire Scores as a Function of Age

Age group (years)	*n*	General Frequency of Forgetting (33 items)		Seriousness of Forgetting (18 items)		Retrospective Functioning (5 items)		Mnemonics Usage (8 items)	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
16–29	110	165.26	22.19	77.10	20.13	22.96	5.08	32.47	9.59
Z		.38	.79	−.31	.98	.68	.89	.22	1.00
30–49	78	166.51	26.21	85.58	21.59	20.90	4.75	29.42	8.43
Z		.43	.94	.15	1.05	.31	.83	−.10	.89
50–59	79	155.99	25.53	83.75	20.02	17.70	4.62	30.49	8.89
Z		.05	.92	.01	.97	−.25	.81	.01	.93
60–69	242	152.13	28.12	85.52	20.09	18.31	5.68	30.87	9.44
Z		−.09	1.01	.10	.98	−.14	1.00	.05	.99
70–79	210	148.72	29.12	83.55	20.89	18.18	5.74	29.70	10.26
Z		−.21	1.05	.00	1.01	−.16	1.01	−.07	1.08
80–89	59	148.54	26.93	82.31	19.59	17.89	5.64	28.30	8.69
Z		−.22	.97	−.06	.96	−.21	.99	−.22	.92
Total	778	154.63	27.83	83.48	20.56	19.10	5.69	30.40	9.52

Note. Scores are unit-weighted factor scores to simplify calculation. Higher scores indicate fewer self-reported memory problems and less use of mnemonics. For additional interpretability, one may divide both the mean and the standard deviation by the respective number of items for scores on the original 7-point scale.

An important point to remember when interpreting these results is that although all these effects, including age, may be statistically significant, in combination they do not account for more than 9% of the variance on any factor. Thus, for practical purposes, the MFQ taps constructs other than age, health, or education-associated tendencies toward more negative self-assessment of memory functioning.

Discussion

The original purpose for developing the MQ and MFQ was to create an instrument for the assessment of self-perceptions of memory abilities. Early research (Zelinski et al., 1980) showed that responses to open-ended questions about whether individuals experienced memory problems tended to be age biased, with only older adults admitting to such difficulties, whereas a checklist approach appeared to be less age biased in indicating everyday memory failures. With the development of questionnaires to quantify memory self-assessments, it became possible to examine the roles of various factors, such as age, sex, depression, and personality, in contributing to individual differences in self-perception of memory ability. The dimensions of memory self-appraisal identified in the MFQ factor scores are not highly intercorrelated, making it possible to evaluate specific patterns of self-appraisal with respect to clinical issues. For example, the Seriousness of Forgetting and Retrospective Functioning scores, which evaluate the perception of how critical memory failures are and the perception of present functioning relative to the past, respectively, might be more reflective of depressive affect than the Mnemonics Usage score because of negative cognitions associated with depression relative to actual attempts to address perceived memory deficits. Thus, patterns of factor scores may be useful in differentiating individuals who may be experiencing minor impairments (who would be expected to score high on the Mnemonics Usage scale) from those who are depressed.

Table 6
Results of Stepwise Regression of Demographic Characteristics on Memory Functioning Questionnaire Scores

Factor	β	*T*	*p*	R^2
General Frequency of Forgetting				
Age	−.20	−4.46	.0001	.06
Health	.18	3.89	.0001	.03
Total				.09
Seriousness of Forgetting: Health	.13	2.82	.005	.02
Retrospective Functioning: Age	−.17	−3.88	.0001	.03
Mnemonics Usage: Education	−.12	−2.56	.01	.01

The results of the analyses indicate the psychometric characteristics of the MFQ as an assessment instrument. First, exploratory factor analysis yielded four meaningful factors on which seven scales loaded. This accomplishes our goal of obtaining fewer scores to summarize MFQ responses but at the same time verifies the multidimensionality of the constructs of the scales that we originally reported (Zelinski et al., 1980). Second, the factor structure was shown to be invariant over age, over samples, and longitudinally over 3 years.

Third, unit weights for computing factor scores, which simplify scoring of the MFQ, were found to correlate almost perfectly with the original factor scores and to reproduce the pattern of factor intercorrelations. Fourth, the factor scores have good internal consistency. Fifth, demographic characteristics of subjects, including their age, health status, and educational attainment, accounted for only a small amount of the variance in each factor score, indicating that MFQ responses are not confounded with these variables.

The MFQ therefore has some useful psychometric properties. In clinical work, reliable assessment of complaints may provide a face-valid and less threatening way of assessing cognitive functioning than is typically done with more anxiety-producing and less meaningful laboratory memory tests (Gilewski & Zelinski, 1986). Thus, although the MFQ is not a substitute for memory tasks, it is likely to be a useful adjunct to those tasks because it measures how individuals perceive their memory abilities, which may bear to some extent on their performance (Zelinski et al., 1990).

Nevertheless, our findings of reliable age differences in MFQ responses conflict with those of Dixon and Hultsch (1983, 1984; Hultsch, Hertzog, & Dixon, 1987). They found that the individual scales of the MFQ did not produce age differences in regression analyses where age was a continuous variable. We, however, did. Because Dixon and Hultsch sampled less educated people and a somewhat smaller age range (20–78 years, compared with our 16–89 years), the range of responses may have been more restricted, reducing the likelihood of obtaining significant findings (Hertzog et al., 1987, 1989, made a similar suggestion about subjects generally using only 5 of the 7 points for ratings on the scales).

We also found that self-ratings of health accounted for a small but reliable proportion of the variance in MFQ responses. This finding is similar to one reported by Cutler and Grams (1988), who found that approximately 9% of the variance in responses to a question about memory problems was accounted for by health problems. In our study, we have no objective evidence that the self-ratings of health reflected actual health status, so it is not clear whether health problems or a tendency toward neuroticism or hypochondriasis is the source of the self-report on health. In the article by Cutler and Grams, health was determined by responses to questions about various kinds of impairments, so we may assume that our findings reflect health problems, but it is an issue best resolved by the additional collection of data.

In sum, we have presented evidence that the MFQ is a reliable instrument. Studies evaluating the concurrent validity of the MFQ with respect to memory performance and depression recently have been completed (Zelinski et al., 1990), and studies examining the validity of the MFQ in predicting clinical memory deficits are in progress.

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Appendix

Memory Functioning Questionnaire

This is a questionnaire about how you remember information. There are no right or wrong answers. Circle a number between 1 and 7 that best reflects your judgment about your memory. Think carefully about your responses, and try to be as realistic as possible when you make them. Please answer all questions.

General Frequency of Forgetting

How would you rate your memory in terms of the kinds of problems that you have?

major problems			*some minor problems*			*no problems*
1	2	3	4	5	6	7

How often do these present a problem for you?

	always			*sometimes*			*never*
a. names	1	2	3	4	5	6	7
b. faces	1	2	3	4	5	6	7
c. appointments	1	2	3	4	5	6	7
d. where you put things (e.g., keys)	1	2	3	4	5	6	7
e. performing household chores	1	2	3	4	5	6	7
f. directions to places	1	2	3	4	5	6	7
g. phone numbers you've just checked	1	2	3	4	5	6	7
h. phone numbers you use frequently	1	2	3	4	5	6	7
i. things people tell you	1	2	3	4	5	6	7
j. keeping up correspondence	1	2	3	4	5	6	7
k. personal dates (e.g., birthdays)	1	2	3	4	5	6	7
l. words	1	2	3	4	5	6	7
m. going to the store and forgetting what you wanted to buy	1	2	3	4	5	6	7
n. taking a test	1	2	3	4	5	6	7
o. beginning to do something and forgetting what you were doing	1	2	3	4	5	6	7
p. losing the thread of thought in conversation	1	2	3	4	5	6	7
q. losing the thread of thought in public speaking	1	2	3	4	5	6	7
r. knowing whether you've already told someone something	1	2	3	4	5	6	7

As you are reading a novel, how often do you have trouble remembering what you have read . . .

	always			*sometimes*			*never*
a. in the opening chapters, once you have finished the book	1	2	3	4	5	6	7
b. three or four chapters before the one you are currently reading	1	2	3	4	5	6	7
c. the chapter before the one you are currently reading	1	2	3	4	5	6	7
d. the paragraph just before the one you are currently reading	1	2	3	4	5	6	7
e. the sentence before the one you are currently reading	1	2	3	4	5	6	7

When you are reading a newspaper or magazine article, how often do you have trouble remembering what you have read . . .

	always			*sometimes*			*never*
a. in the opening paragraphs, once you have finished the article	1	2	3	4	5	6	7
b. three or four paragraphs before the one you are currently reading	1	2	3	4	5	6	7
c. the paragraph before the one you are currently reading	1	2	3	4	5	6	7
d. three or four sentences before the one you are currently reading	1	2	3	4	5	6	7
e. the sentence before the one you are currently reading	1	2	3	4	5	6	7

(*Appendix continues on next page*)

How well you remember things that occurred . . .

	very bad			*fair*			*very good*
a. last month is	1	2	3	4	5	6	7
b. between 6 months and 1 year ago is	1	2	3	4	5	6	7
c. between 1 and 5 years ago is	1	2	3	4	5	6	7
d. between 6 and 10 years ago is	1	2	3	4	5	6	7

Seriousness of Forgetting

When you actually forget in these situations, how serious of a problem do you consider the memory failure to be? . . .

	very serious			*somewhat serious*			*not serious*
a. names	1	2	3	4	5	6	7
b. faces	1	2	3	4	5	6	7
c. appointments	1	2	3	4	5	6	7
d. where you put things (e.g., keys)	1	2	3	4	5	6	7
e. performing household chores	1	2	3	4	5	6	7
f. directions to places	1	2	3	4	5	6	7
g. phone numbers you've just checked	1	2	3	4	5	6	7
h. phone numbers used frequently	1	2	3	4	5	6	7
i. things people tell you	1	2	3	4	5	6	7
j. keeping up correspondence	1	2	3	4	5	6	7
k. personal dates (e.g., birthdays)	1	2	3	4	5	6	7
l. words	1	2	3	4	5	6	7
m. going to the store and forgetting what you wanted to buy	1	2	3	4	5	6	7
n. taking a test	1	2	3	4	5	6	7
o. beginning to do something and forgetting what you were doing	1	2	3	4	5	6	7
p. losing the thread of thought in conversation	1	2	3	4	5	6	7
q. losing the thread of thought in public speaking	1	2	3	4	5	6	7
r. knowing whether you've already told someone something	1	2	3	4	5	6	7

Retrospective Functioning

How is your memory compared to the way it was . . .

	much worse			*same*			*much better*
a. 1 year ago?	1	2	3	4	5	6	7
b. 5 years ago?	1	2	3	4	5	6	7
c. 10 years ago?	1	2	3	4	5	6	7
d. 20 years ago?	1	2	3	4	5	6	7
e. when you were 18?	1	2	3	4	5	6	7

Mnemonics Usage

How often do you use these techniques to remind yourself about things? . . .

	always			*sometimes*			*never*
a. keep an appointment book	1	2	3	4	5	6	7
b. write yourself reminder notes	1	2	3	4	5	6	7
c. make lists of things to do	1	2	3	4	5	6	7
d. make grocery lists	1	2	3	4	5	6	7
e. plan your daily schedule in advance	1	2	3	4	5	6	7
f. mental repetition	1	2	3	4	5	6	7
g. associations with other things	1	2	3	4	5	6	7
h. keep things you need to do in a prominent place where you will notice them	1	2	3	4	5	6	7

Note. The name of the factor on which each scale loads is given at the beginning of each set of items belonging to that factor.

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