

Memory and Learning: 15 Words Test

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Introduction

Memory is a salient theme in gerontology. This is because it is one of the cognitive functions which clearly (at least in a number of memory components) deteriorate with aging. At the same time both young and old people are highly concerned about any possible decline in memory performance. The latter may be due to the anxiety about dementia which is associated with decreased memory performance. The exact nature, causes and consequences of memory decline have not yet been established. The causes of memory decline, however, are thought to be both neurological and contextual (environmental) (Arbuckle *et al.* 1992, Smits *et al.*, in press). The assumed multitude of causes of memory decline asks for a multidimensional approach such as in LASA.

The 15 Words Test (Lezak 1983, Deelman *et al.* 1980) was used as a measure of secondary memory performance, meaning that some processing of the information has taken place after presentation of the stimuli. It is a memory test designed to be used in a laboratory setting, which allows the isolation of the respondent from noise and other distractors.

The 15 Words Test is regarded as a reliable and useful instrument, although not very pleasant to the respondent, as he/she tends to feel frustrated by the multitude of words and the number of trials. Partly because of this and partly because of time considerations, it was decided to limit the number of presentation trials to three, and to leave out the final recognition trial (in which the 15 familiar words have to be recognized from a list to which new words are added). As it was too cumbersome for the interviewers to bring along a tape recorder with the official recording of the list presentations, the interviewers read out the word lists to the respondents in person.

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Procedure

The 15 Words test was included in the medical interview. The test procedure is as follows. The interviewer explains the aim of the test; asking the respondent to remember as many words as possible of the list which is to be presented. Next, (s)he reads aloud the list of 15 words (carefully selected in terms of frequency of occurrence, number of syllables, stage at which acquired during life and mental imagery). The respondent then sums up as many words as (s)he remembers. This procedure (presentation and recall) is repeated for the first three trials, using the same word list. During approximately 20 minutes the respondent is occupied with a different, non-verbal task. Finally, the respondent is asked to recall as many words of the list as possible (delayed recall). For this latter task the respondent is not prepared. During the test, the interviewer ticks off the words correctly recalled and notes any errors, words which are mentioned twice or more at one trial and words not included in the list.

The scores produced by the 15 Words Test are the number of words correctly remembered per trial, i.e. Trial 1, Trial 1, Trial 3, Delayed Recall (DR), and a number of derived scores. The first of these is the sum of the words correctly recalled during the first three trials (Learning). Second, the maximum score on any of the first three trials (Tmax) and third, the highest score on any of the first three trials minus the score on Trial 1 (Delta). Both the Learning and the Delta scores reflect the capacity of the respondent to learn.

Results

2671 respondents completed the 15 Words Test. Table 1 shows the basic descriptive statistics.

It is obvious from Table 1 that respondents improve over the first three trials. After the twenty minutes delay, not many words are still remembered, on average slightly less than five words. Table 1 shows that most scores produce a normal curve, with acceptable skewness and kurtosis scores. The correlation with age is mostly high and negative, meaning that the older respondents perform worse than younger respondents. The correlations with education are all significant, implying that respondents with a higher education did better on this memory task than their less well educated peers. The association of the test scores with education is less strong than with respondents' age.

Table 1
Descriptive statistics of the 15 Words Test

	M	SD	Range	Skew	Kurtosis	Cor-age*	Cor-educ*
T1	4.3	1.9	0-11	.07	.12	-.43	.26
T2	6.3	2.5	0-14	-.14	.08	-.43	.24
T3	7.4	2.9	0-15	-.27	.18	-.43	.21
DR	4.9	2.9	0-15	.38	-.12	-.42	.20
Learn	18.0	6.8	0-39	-.23	.20	-.47	.26
Tmax	7.6	2.8	0-15	-.20	.25	-.44	.23
Delta	3.3	1.9	0-10	.28	-.25	-.21	.06

* All correlations significant at $p < .0001$ except Delta with education ($p = .001$)

Table 2 shows the results of an analysis of differences in scores between the sexes. Women appear to outdo men in word list recall on all parameters derived from the test.

Table 2
Gender differences in performance on the 15 Words Test
(Analysis of variance)

	Cell means		P-Value
	Male	Female	
T1	4.1	4.6	.000
T2	5.9	6.7	.000
T3	6.8	7.9	.000
DR	4.3	5.4	.000
Learn	16.8	19.2	.000
Tmax	7.1	8.2	.000
Delta	3.0	3.6	.000

Conclusions

The above results are in line with earlier research. The good psychometric properties of the 15 Words Test are confirmed in the present data. The 15 Words Test appears to be a measure of memory which can be

used in a survey context such as LASA. The correlations with education suggest the impact of contextual factors, whereas the correlations with age suggest neurological influences. These conclusions, however, can only be provisional, as more (longitudinal) data and more refined analyses are needed to explain differences in memory decline.

References

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