

Perceptions of Memory Functioning

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Introduction

There is ample evidence of reduction in memory performance with aging. Moreover the expected decline in average memory performance with age is accompanied by a marked increase in variance between individuals. Self-knowledge and beliefs about one's own memory functioning (termed metamemory) have been explored in an attempt to assess the explanatory ability of metamemory for individual differences in memory functioning. A variety of approaches has been employed to measure individuals' perceptions on their own memory. The most widely used rely on self-report questionnaires. The Metamemory in Adulthood (MIA) Questionnaire of Dixon and Hultsch (1983) is the most extensive questionnaire. We developed an abbreviated version, the use of which is better feasible in large-scale population studies.

Central question

The central issue in this chapter is the utility of an abbreviated version of the MIA (a-MIA) as a measure for metamemory. Two questions will be answered:

- a. The frequency distribution of an abbreviated version of the MIA (a-MIA) in the older population.
- b. The relation of the a-MIA with age, sex and level of education.

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Measurement of metamemory

The original MIA consists of seven subscales and 108 items (Dixon and Hulstsch 1984). Each of these subscales is supposed to measure a different aspect of metamemory functioning: (a) *Task* or knowledge of basic memory processes, (b) *Strategy* or knowledge and reported use of memory strategies, (c) *Capacity* or beliefs regarding one's own memory capacity, (d) *Change* or perceived change in memory capacities, (e) *Achievement* or perception of one's own motivation to perform well in memory tasks, (f) *Anxiety* or perceptions of the relationship between anxiety and memory performance and (g) *Locus* or perceived sense of control over memory skills. Factor analysis with the original 108 items revealed two factors: (1) memory self-efficacy, i.e. beliefs the individual holds about his or her memory abilities. This factor mainly consists of the subscales Locus, Capacity and Change, (2) memory knowledge, i.e. factual knowledge about memory tasks, processes and strategies, mainly consisting of the subscales Achieve, Strategy and Anxiety.

In the LASA pilotstudy we used all items, except the subscale Task, which appeared to have no correlation with age in several studies from literature. Based on correlations between subscales, internal consistency and face-validity, the 92 MIA items used in the pilot, were reduced to 30 items (a-MIA). These items were included in the self-administered questionnaire that was left with the respondents after the interview.

Sample

The study sample consists of 1776 subjects. 804 out of the total of 3107 subjects did not participate in the self-administered part of the study at all. The remaining 2303 subjects filled out at least one item of the self-administered questionnaire. 527 subjects did not complete the full MIA questionnaire.

Factor analysis

Factor analysis on the 30-item a-MIA revealed three main factors, which correspond with the subscales Anxiety (9 items), Strategy (10 items) and Locus (5 items). The six remaining items were distributed across three other factors, comparable with the subscales Capacity, Change and

Achievement. If factor analysis was constrained to three factors, two factors emerged. The first factor corresponds to self-knowledge, consisting of the shortened subscales Anxiety and Strategy; the second factor corresponds to self-efficacy, using the items of the abbreviated subscale Locus.

Despite a considerable item reduction of the original MIA, we might conclude that the a-MIA can be used on subscale level, in particular the subscales Anxiety, Locus and Strategy have been retained. Also the concepts of self-efficacy and self-knowledge can be derived from the 30-item a-MIA. Further analysis of the three main factors of the a-MIA (Anxiety, Locus and Strategy) shows the following.

Table 1
Descriptive statistics of three factors of the abbreviated metamemory scale (a-MIA)

Anxiety	9 items range 9-45 max score 45 mean 22.6 (sd 7.7) skewness .16 kurtosis -.52 Cronbach's alpha .87
Locus	5 items range 5-25 max score 25 mean 16.4 (sd 4.0) skewness -.13 kurtosis -.04 Cronbach's alpha .76
Strategy	10 items range 10-50 max score 50 mean 30.2 (sd 7.9) skewness -.06 kurtosis -.34 Cronbach's alpha .84

Table 1 shows a normal distribution of the three factors considering the skewness of the distribution and the kurtosis, a measure for the flatness of the distribution. The internal consistency of the factors is measured by Cronbach's alpha. These values are quite satisfactory and correspond with those presented by Dixon and Hultsch (1983) in their original publication.

The correlations between the factors (Table 2) indicate that locus or perceived sense of control over memory skills, is relatively independent from anxiety, or perceptions of the relationship between anxiety and

memory performance. The same correlation is found between reported use of memory strategies (locus) and anxiety. On the other hand a fair amount of correlation does exist between the use of memory strategies and perceptions of anxiety. This means that the level of anxiety influences the use of memory strategies: the higher the level of anxiety, the more memory strategies are used.

Table 2
Correlations between three factors of the abbreviated metamemory scale (a-MIA)

	Locus	Strategy
Anxiety	.14*	.32*
Locus	-	.14*

* $p = .001$

Table 3
Correlations of metamemory factors with age, education and sex

	Age	Education	Sex
Anxiety	.14**	-.13**	$p = .00$
Locus	.06*	-0.05	$p = .18$
Strategy	.10**	.11**	$p = .01$

* $p = .01$ (Pearson corr coeff)

** $p = .001$ (Pearson corr coeff)

Table 3 indicates that old-old individuals perceive more anxiety over their memory performance, less control over their memory skills and that they use memory strategies more frequently, as compared to young-old. Moreover females are more anxious and use more strategies as compared to males. Lastly highly educated elderly are less anxious but use more strategies, as compared to elderly with lower education. The results of the correlations about females and highly educated elderly correspond to Hultsch *et al.* (1987, 1988). However, the authors of the original MIA version did not find a positive correlation between old-old individuals and anxiety and strategy respectively, although in their study a loss of control in old-olds has also been established.

Discussion

The results of this study confirm the utility of a shortened version of the MIA, to be used in large-scale population studies. It underlines that highly educated persons and women use memory strategies more frequently. This is likely to happen as soon as memory decline at increasing age results in feelings of anxiety and loss of control over memory skills. Despite the considerable item reduction of the MIA, the basic characteristics of the scale have been maintained. The 30-item version (a-MIA) can be used on subscale level - in particular the subscales Anxiety, Locus and Strategy - but also as a procedure to measure different aspects of metamemory as a whole.

This study confirms earlier results based on findings among students and elderly people. Differences in metamemory within a sample of population-based elderly aged 55-85 years, had not yet been studied. The main conclusion is, that elderly individuals can not be considered as a homogeneous category. Perceptions on memory differ among subgroups such as defined by age and education.

References

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