

## Subjective forgetfulness in a normal Dutch population: possibilities for health education and other interventions

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### Abstract

Many, especially elderly people, are worried about their diminishing memory. In order to be able to improve health education activities about forgetfulness and aging processes, nearly 2000 healthy Dutch people, aged 25–85 years, participated in a postal survey into the determinants of subjective forgetfulness. As expected, there was a systematic increase in the prevalence of forgetfulness with age. The relatively high prevalence of forgetfulness in the young (29%) and middle-aged groups (34%) was unexpected. Besides age, the occurrence of dementia in a close relative appeared to be a strong predictor of people's subjective forgetfulness. Furthermore, people who felt more in control of their memory functioning reported less forgetfulness. Younger people ascribed their forgetfulness mostly to external causes (stress, concentration) and older people to internal causes (age, retardation). Eleven percent of all forgetful people were interested in an intervention for their memory complaints. In this group, education (37%), memory training (29%), and medication (12%) were the preferred interventions. No differences were found between older and younger respondents. © 1998 Elsevier Science Ireland Ltd.

*Keywords:* Memory complaints; Forgetfulness; Dementia; Health education

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### 1. Introduction

From research it appears that a lot of people, and especially elderly people, are worried about their diminishing memory and/or about incipient dementia [1]. However, earlier research shows that most people's concern about dementia is unsubstantiated [2]. Elderly people feel less in control of their

memory functioning than younger people [3] and they are more upset than younger people when they forget things of everyday life [4]. However, there is no straightforward relation between memory complaints and memory performance [5]. Labeling oneself forgetful involves more than simply how frequently one forgets. It is "a personal response to the interaction between one's forgetting and one's social world" [6]. Memory performance is not only determined by a person's actual memory abilities, but also by his or her Memory Self-Efficacy (MSE), a

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term used to indicate a person's expectations about successfully using his or her abilities [7].

One factor which may be linked to memory complaints are the perceptions or stereotypes that older adults hold about the aging process and, in particular, the cognitive decline generally associated with aging [8]. Another reinforcing factor of people's uncertainty and worries about a diminishing memory is a lack of systematically planned information to the general public about this subject [9]. Hardly any information is available about normal forgetfulness and the changes in the working of the human memory with increasing age, nor about the differences between normal forgetfulness and dementia. This could increase concern among people who are already uncertain about their diminishing memory.

In order to be able to improve health education activities in the field of dementia and forgetfulness, information about the target group, a careful planning of these activities and their implementation are indispensable [10,11]. Therefore, the first aim of this study is to gain information about people's subjective forgetfulness and their need for information or other interventions (specialist, memory training, medication). The second objective is to get more insight into the determinants of this forgetfulness and these needs. This information would make it possible to plan interventions more adequately, to protect people's quality of life, to prevent medical shopping, and to make considerable savings for the health care system. Therefore, demographic characteristics and other variables that distinguish between forgetful and non-forgetful people were investigated. This second objective was also investigated by Ponds et al. [12], who studied the same sample of subjects as described in this study. In their study three demographic variables were tested: age, sex, and level of education. They also investigated two variables of aging, namely feelings of depression and subjective health. Logistic regression analysis showed that, as expected, age is a strong predictor of subjective forgetfulness and that sex and level of education are not. Feelings of depression and poor subjective health also appeared to predict subjective forgetfulness. For more detailed information we refer to Ponds et al. [12].

From an health educational point of view, it is

important to know to which causes people ascribe their forgetfulness (stable versus unstable and internal versus external) and to have information about the role of dementia in a close relative. We assessed three dimensions of metamemory, using the Metamemory in Adulthood (MIA) questionnaire, to explain differences between forgetful and non-forgetful people [13].

## 2. Methods

### 2.1. Subjects and procedure

The Maastricht Ageing Study (MAAS) makes use of healthy subjects who were selected from the Register of General Practices (RNH), containing demographic and health information from general practices and 42 practitioners in the province of Limburg [14]. Reserach showed that the subjects included in this register can be considered representative for the Limburg and Dutch populations with respect to demographic characteristics [15]. Problems were identified according to the International Classification of health problems in Primary Care (ICPC) [16].

In September 1993 a stratified sample of 4000 subjects was drawn from the RNH population, with the same number of subjects in four different age-groups: 25–35 years (young), 40–50 years (young middle-aged), 55–65 years (old middle-aged), and 70–85 years (old). The required number of subjects was not reached in the oldest group.

Because we were only interested in healthy people, several exclusion criteria were used: overt cerebrovascular disease, chronic neurological pathology (e.g. dementia, epilepsy, parkinsonism), mental retardation, and major psychiatric disorders. This resulted in exclusion of 4.7% ( $N = 187$ ) of the originally selected population of 3941. All remaining subjects were invited by their general practitioners to participate in the study. Of the total group, 63.3% participants ( $N = 2340$ ) responded positively and were sent the postal survey questionnaire; 2043 subjects (87%) completed and returned this questionnaire in good order. Unfortunately, we have no information available about the people who agreed to participate, but did not ( $n = 297$ ), nor about the

differences between those people and the people who actually participated.

Only subjects with complete data on the questions concerning forgetfulness were included in this study (see below). For this reason 72 subjects were excluded.

## 2.2. Measures

The prevalence of subjective forgetfulness was assessed with the question “Do you consider yourself as being forgetful?” Respondents who answered “yes” to this question also rated the hindrance their forgetfulness caused them in daily life and their worries about their forgetfulness on a 5-point scale. These scales varied from “no hindrance at all” (score 1) to “very much hindrance” and “very worried” (score 5). Subjects with missing data on one or more of these three questions ( $n = 72$ ) were excluded from the analyses.

People who considered themselves forgetful were asked to indicate the possible cause(s) and to rate its importance. This question was prestructured with nine items and based on a previous study [9]. Subjects also had the opportunity to mention a cause that was not on the list. Only the most important cause mentioned by each subject was used in this study.

Educational level was measured by a Dutch scoring system [17] which consists of an 8-point scale, ranging from unfinished primary education (level 1) to university education (level 8). In analyzing the results, educational level was compressed to three levels: low level (educational level 1 and 2), medium level (3–5), and high level (6–8). These levels roughly correspond with primary education, junior vocational training, and senior vocational or academic training.

All subjects were asked whether they had a close relative (first to third grade) with dementia (or severe memory problems) which resulted in helplessness. People could answer “yes” or “no” and could indicate who the relative was (father, mother, brother, sister, etc.). Based on previous research, it was expected that “dementia in the family” is an important determinant of people’s forgetfulness [9].

The MIA measures four broad dimensions of metamemory. Three of these dimensions were mea-

sured in this study: *Task*: factual knowledge about memory tasks and memory processes; (Cronbach’s  $\alpha = 0.81$ ), *Anxiety*: memory-related affect (affective states generated by or associated with memory-demanding situations; Cronbach’s  $\alpha = 0.87$ ), and *Locus of control*: memory self-efficacy (beliefs about memory abilities, strengths, and weaknesses; Cronbach’s  $\alpha = 0.69$ ). In this study the abridged Dutch MIA was used [18], which is based on the original MIA of Dixon et al. [13].

All subjects were asked to indicate whether they had used, for longer than one month, medication that was not prescribed by their doctor and which was intended to improve their vitality, energy, and memory (“yes” or “no”).

Psychological life events in the past 12 months were measured because most life events are stressors and are expected to have a negative impact on memory function. A list of 15 possible life events was included in the questionnaire. People could indicate the events that were applicable to their life in the past 12 months. They also had the possibility to give an answer that was not in this list. Examples of life events are death of a loved one, moving, severe illness, marriage, and birth of a child.

Satisfaction with life (SWL) was measured with nine questions (Cronbach’s  $\alpha = 0.78$ ) about people’s personal situation. Subjects were asked to indicate their satisfaction with their financial situation, job, contact with partner and family, leisure time, health, etc. on a 5-point Likert scale varying from unsatisfied (1) to satisfied (5). The range of this scale is 9–45.

Several studies have demonstrated a relation between self-appraisal of memory functioning and affective state [19]. Therefore, our hypothesis is that people who are less satisfied with important aspects of their lives will report more subjective forgetfulness.

Subjects who considered themselves forgetful were asked whether or not they had considered asking for help or getting information about their memory complaints. If yes ( $n = 86$ ), they were asked which type of intervention or information had their preference and also to rate its importance. Subjects could choose between six answers or could add an intervention not mentioned in the six answers. Finally, all people were asked whether they would be

interested in receiving drug treatment that might improve their memory (“yes” or “no”). Because of the large sample size, only  $P$  values  $< 0.01$  were considered significant.

### 3. Results

#### 3.1. Forgetfulness: prevalence, hindrance and worry

Of the 1971 people who answered the three questions about forgetfulness, 764 people (38.8%) consider themselves forgetful. The prevalence of forgetfulness in the youngest age-group was 29.4%. This percentage increased with age: 33.9% in the group 40–50 years, 40.7% in the age-group 55–65 years, and 51.6% in the age-group 70–85 years ( $\text{Chi}^2 = 55.7$ ;  $\text{df} = 3$ ;  $P < 0.001$ ).

Of the people aged 25–35 years, 17% experienced (very) much hindrance from their forgetfulness. This percentage was relatively high in comparison with the 22.7% within the group of people aged 70–85 years. More than 47% of the young people were worried to some extent (score 3 or more on the “worried scale”) about their forgetfulness. The percentage of worried people in the other groups was similar, namely 62.2%, 64.3%, and 60.5%.

There was a strong correlation between hindrance in daily life and worries ( $r = 0.57$ ;  $P < 0.001$ ). The correlations between worries and age ( $r = 0.11$ ;  $P < 0.05$ ) and hindrance and age were very weak ( $r = 0.08$ ;  $P < 0.01$ ). No differences were found between men and women, nor between higher and lower educated people. Duncan’s multiple comparison tests

( $P < 0.05$ ) revealed that only the youngest age group had a significantly lower score for worry than the other groups, who did not differ from each other. There were no effects of sex or education on hindrance and worry. In all age-groups, it appeared that people who were forgetful, were not worried about it if they did not experience hindrance from their forgetfulness. Older people who experienced a lot of hindrance were more worried about their forgetfulness ( $F = 4.7$ ,  $\text{df} = 3$ ;  $P < 0.01$ ).

#### 3.2. Causes of forgetfulness

Table 1 shows the five main causes of forgetfulness given by the forgetful subjects in the four age-groups. More than a quarter of the subjects could not think of a possible reason for their forgetfulness. Aging was mentioned most frequently as a cause of forgetfulness, followed by emotional problems, lack of interest, and problems with concentration. The remaining causes in the list were hardly mentioned: health problems (2.7%), being too busy (2.1%), a lack of mental exercise (2.1%), use of medication (1.3%), always had a poor memory (0.7%), and mental decline (0.7%).

The four most mentioned causes were investigated further by using a series of chi-square tests. Subjects who did not mention a cause were excluded. The older and lower educated subjects mentioned aging more often as the major cause of their forgetfulness than the other subjects did. The younger subjects ascribed their forgetfulness most often to tension and emotional problems, a lack of interest, and poor concentration. Finally, tension and emotional problems were most often mentioned by women, and a

Table 1  
Main causes of forgetfulness among the four age-groups

	Total group	Young	Young middle age	Old middle age	Old
	% $n = 764$	% $n = 141$	% $n = 172$	% $n = 213$	% $n = 238$
1. Age	33.9	2.1	22.7	36.2	58.8
2. Unknown	25.8	24.8	19.8	29.6	27.3
3. Tension/emotional problems	12.2	20.6	12.8	12.2	6.7
4. Lack of interest	9.6	18.4	14.0	8.0	2.5
5. Poor concentration	8.2	17.0	16.3	4.7	0.4
6. Other cause	10.3	17.1	14.4	9.3	4.3

lack of interest more often by the lower educated subjects. The older subjects and the lower educated subjects tended to ascribe their forgetfulness to internal causes (age, health problems, medication, anesthesia, always poor memory), whereas the younger subjects and the higher educated subjects more often mentioned external causes (tension and emotional problems, poor concentration, lack of interest, lack of mental exercise, too busy). These findings are important from a health educational point of view (see discussion).

### 3.3. Dementia in a close relative

The respondents were asked to indicate whether dementia (or severe memory problems) had occurred among their close relatives. This question was answered by 1971 respondents. Almost 500 people ( $n = 484$ ) had a close relative who suffered from dementia (24.6%). The mother was mentioned most often (29%), followed by a grandmother (23%), a grandfather (14%), the father (12%), an aunt (16%), a sister (6%), an uncle (4%), and a brother (2%). It appeared that subjects with a close relative who had dementia indicated that they were forgetful more often than subjects without a demented relative did ( $\text{Chi}^2 = 12.3$ ,  $\text{df} = 1$ ;  $P < 0.0001$ ). However, they were not more worried about their forgetfulness than people without a relative with a dementia syndrome.

### 3.4. Psychological life events

Subjects were asked to indicate whether they had life events in the past 12 months. Of all respondents, 60.5% mentioned one or more life events in the past 12 months. The most common life events were death of a loved one (33%), severe illness of a loved one (13%), moving to another house (13%), a new job or study (7%), a child leaving home (6%), and retirement (4%). Younger subjects mentioned more life events ( $t = 7.0$ ;  $P < 0.001$ ). No differences were found between men and women. With regard to forgetfulness, no differences were found between subjects who reported a life event in the past 12 months and subjects who did not. The number of life events was also of no importance. This finding was not in accordance with our hypothesis.

### 3.5. Satisfaction with life

The average score for the SWL questionnaire was 39.9 ( $\pm 5.3$ ). In general, most subjects were very satisfied with life. Subjects who were forgetful were less satisfied with life ( $t = 5.5$ ;  $P < 0.0001$ ), confirming our hypothesis. However, the clinical relevance of this correlation was very low, since the average score of the forgetful group was 38.9 and of the non-forgetful group 40.4 (range 15–45). No difference was found between men and women. Elderly subjects were less satisfied with life ( $F = 16.9$ ;  $\text{df} = 1$ ;  $P < 0.001$ ).

### 3.6. Task, anxiety and locus of control

**TASK:** The performance on the MIA subscale Task, measuring people's knowledge about memory, was high. The average item score on this 5-point scale with 10 items was 3.8. No differences in knowledge were found between younger and older subjects. Subjects who considered themselves forgetful had more knowledge about memory functioning ( $t = 6.7$ ;  $P < 0.001$ ) than non-forgetful subjects did. Knowledge was not correlated with level of education or sex.

**LOCUS OF CONTROL:** The average score for locus of control, 7 items on a 5-point scale, was 3.3. In general subjects felt quite in control of their memory functioning. No differences were found with respect to age, sex, or level of education. Subjects who considered themselves forgetful experienced having less control of memory function than non-forgetful subjects did ( $t = 4.8$ ;  $P < 0.001$ ).

**ANXIETY:** A person's affective state generated by or associated with memory-demanding situations (12 items) was highly dependent on his or her age. Older subjects had significantly higher anxiety scores than younger subjects ( $F = 23.8$ ;  $\text{df} = 3$ ;  $P < 0.001$ ). As expected, forgetful subjects were more anxious than their non-forgetful counterparts ( $t = 19.3$ ;  $P < 0.001$ ). Women were more anxious than men ( $t = 5.8$ ;  $P < 0.001$ ).

### 3.7. Logistic regression

Because the dependent variable was dichotomous (forgetful, yes or no) and because the independent

Table 2

The prediction of subjective forgetfulness after logistic regression,  $n = 1806$ 

Variable	Regression coefficient (SE)	<i>P</i> -value	Odds ratio (95% CI)
Age: 4 groups	0.291 (0.459)	0.0000	1.34 [1.22–1.46]
Dementia in a close relative: yes/no	0.392 (0.115)	0.0006	1.48 [1.18–1.85]
Locus of control: 3 levels	–0.299 (0.087)	0.0006	0.74 [0.62–0.88]

variables were correlated with each other, we used logistic regression on our set of significant data. Three variables were entered in the regression model: age, the occurrence of dementia in a close relative, and locus of control. Satisfaction with life (no clinically relevant differences) and psychological life events (no statistically significance) were excluded from the analyses. The results are presented in Table 2.

Having a close relative who had dementia was quite a strong predictor of someone's subjective forgetfulness. As expected, age played a significant role with regard to forgetfulness. Subjects with a higher score for locus of control were less inclined to describe themselves as forgetful than subjects with lower scores.

#### 4. Possibilities for future interventions

In order to be able to improve future interventions and health education activities, we gathered information about the people who had undertaken or who had considered undertaking action to improve their memory. This group was also asked the following question: "Are you interested in participation in a treatment that possibly has a positive influence on the working of your memory?"

##### 4.1. Medication to improve memory

All subjects were asked whether they use(d) medication that was not prescribed by a doctor in order to improve their memory functioning or vitality. No information is available about the type of medication they use(d). Eleven percent of the total group had used this type of medication for at least one month, elderly subjects more often than younger

subjects ( $t = 2.9$ ;  $P < 0.01$ ). No difference was found between men and woman nor between higher and lower educated subjects. Subjects with higher scores on the MIA-subscale "Anxiety" used this type of medication more often than other subjects did ( $t = 4.0$ ;  $P < 0.001$ ). Subjects with a demented relative also used more medication to improve their memory ( $\text{Chi}^2 = 11.5$ ;  $\text{df} = 1$ ;  $P < 0.001$ ). No differences were found with regard to the MIA-variables "Task" and "Locus of control".

##### 4.2. Need for treatment or information

Eighty six of the 764 subjects who described themselves as forgetful (11.3%) had considered looking for a treatment for or getting information about their memory complaints, or had actually done so. These figures show that most forgetful people do not feel need for treatment or information. Subjects who had this need were more worried about their forgetfulness ( $t = 8.0$ ;  $P < 0.001$ ) and experienced more hindrance in daily life ( $t = 6.0$ ;  $P < 0.001$ ) than the subjects without this need. No differences were found between men and women, subjects with a high and low level of knowledge or locus of control, older and younger subjects and subjects with and without a demented relative. Subjects with a higher level of education considered getting information or treatment more often than other subjects did ( $\text{Chi}^2 = 12.2$ ;  $\text{df} = 2$ ;  $P < 0.001$ ). Although the subjects could indicate more than one preference, Table 3 presents the most important treatment or intervention preferences.

##### 4.3. Treatment with medication

All subjects who considered themselves as being forgetful were asked the following question: "Are

Table 3

Need for treatment and information among the group of forgetful people,  $n = 86$ 

Education (e.g. a brochure or an information meeting)	37%
A course or a training program	29%
Consultation with a general practitioner or a specialist	20%
Medication prescribed by a physician	6%
Medication from a practitioner of complementary medicine	4%
Over-the-counter medication to improve memory	2%
Other	2%

you interested in participation in a treatment with medication that possibly has a positive effect on the working of your memory?" This question was answered by all 764 forgetful subjects. Almost 47% of these subjects were interested in a treatment with medication. These subjects were more worried about their forgetfulness than were the subjects who were not interested in such treatment ( $t = 8.8$ ;  $P < 0.001$ ). They also experienced more hindrance in daily life ( $t = 6.8$ ;  $P < 0.001$ ) and they tended to be older ( $t = 2.7$ ;  $P < 0.01$ ). With regard to causes of forgetfulness, one variable appeared to be significant. Subjects who ascribed their forgetfulness primarily to their poor concentration were more interested in receiving treatment ( $\text{Chi}^2 = 25.0$ ,  $\text{df} = 1$ ,  $P < 0.001$ ). Furthermore, men were more interested in a treatment with medication than women were. ( $\text{Chi}^2 = 7.7$ ;  $\text{df} = 1$ ;  $P < 0.01$ ). Finally, the results show that subjects who already used medication to improve memory (not prescribed by a doctor) were more interested in receiving treatment than subjects who never used medication ( $\text{Chi}^2 = 9.3$ ;  $\text{df} = 1$ ;  $P < 0.01$ ).

## 5. Discussion

From this study it appears that a relatively high percentage of young people (25–35 years), almost 30%, consider themselves forgetful and also that 17% of the subjects in this age-group experienced very much hindrance from this forgetfulness in daily life. Among the subjects aged 70–85 years, more than 50% described themselves as forgetful. This is quite a high number, if one takes into consideration the fact that the subjects in this project were healthy people. In fact, health was one of the inclusion criteria.

The younger subjects ascribed their forgetfulness mostly to external causes, especially emotional problems, poor concentration, and a lack of interest. Older subjects more often indicated internal causes; age, mental retardation, medication, and narcosis. There were hardly any differences in the prevalence of forgetfulness between men and women and between subjects with a high or a low level of education. When planning health education activities, one should take into consideration the different causes mentioned by younger and older people.

In contrast to what was expected, there were no differences in forgetfulness between subjects who did or did not mention psychological life events in the past 12 months. Subjects who were less satisfied with their lives more often reported subjective forgetfulness. However, this difference was not of clinical significance, because forgetful and non-forgetful subjects both had very high scores on the satisfaction scale.

Forgetful subjects had more knowledge about memory tasks and memory-related processes than did non-forgetful subjects. This could be explained by the fact that subjects with memory problems are more focussed on and interested in information that has something to do with their complaint. Logistic regression analysis showed that subjects with higher scores for locus of control were less often forgetful. This can be explained by the fact that they experience more internal control of their memory functioning. Logistic regression analysis also showed that subjects who had a close relative with dementia more often experienced subjective forgetfulness. This may be because this group is more focussed on their own memory functioning. Other research has revealed that people with dementia in the family are more worried about developing a dementia syndrome themselves, independent of their actual cognitive test

performance, than are people without demented relatives [2].

Eleven percent of all forgetful subjects were interested in treatment or information. People who had this need experienced more hindrance in daily life and were more worried about their forgetfulness than the group without this need for information or treatment. No differences in age were found. Most subjects were interested in training and education as a possible intervention to decrease their worries or to improve the functioning of their memory in daily life. Interestingly, 12% of the participants mentioned medication as their number one intervention. Furthermore, 47% of all forgetful people were interested in a treatment with medication that possibly has a positive effect on the working of their memory. This is a very high percentage in comparison with the 11% who initially reported being interested in treatment or information.

Future interventions and policy should pay special attention to people who have a demented relative because these people are worried by a fear of hereditary defects. The Dutch Alzheimer's Association has recently issued a special brochure with information about the heredity of Alzheimer's Disease and other dementias. In our future research we will focus on the psycho-social determinants of cognitive aging, the role of medication, and the possible contribution of the general practitioner to health education activities.

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