Memory Complaints, Coping, and Well-Being in Old Age: A Systemic Approach

Paul Verhaeghen, PhD,¹ Nathalie Geraerts, MA,² and Alfons Marcoen, PhD²

A study on memory complaints (as measured by selected sub-scales of the Metamemory in Adulthood Questionnaire) and its context was conducted on 179 older adults. A path analysis showed that memory complaints influence coping behavior through memory-related anxiety and perceived seriousness of complaints and that both memory complaints and coping influence well-being. Locus of control was found to be the most important antecedent variable in the model.

Key Words: Metamemory, Dysphoria, Anxiety, Competence

Older adults frequently complain about memory failures and they often perceive a decline in their memory performance (e.g., Blazer, Hays, Fillenbaum, & Gold, 1997; Cutler & Grams, 1988). These complaints, of course, do not occur in a vacuum. It is important to investigate where those complaints come from, how older adults deal with this perceived memory decline, and how these are tied in with the individual's well-being. In the present study, we explore the links between memory complaints, coping, and affective variables, adopting a systemic approach; that is, we examined the flow of influences among complaints, coping, and affect in through path analytic procedures.

Although at first sight it seems reasonable to assume that memory complaints are tied to memory abilities, many researchers have found that memory complaints are more closely related to cognitive and personality variables than to objective performance on memory tests (Barker, Carter, & Jones, 1994; Blazer et al., 1997; Bolla, Lindgren, Bonaccorsy, & Bleeker, 1991; Feher, Larrabee, Sudolovský, & Crock, 1994; Flicker, Ferris, & Reisberg, 1993; Hänninen et al., 1994; Kahn, Zarit, Hilbert, & Niederehe, 1975; Ponds & Jolles, 1996). Indeed, the external validity of memory complaints is quite low, that is, complaints and objective performance do not covary much (Christensen, 1991). Perhaps the strongest evidence for the nonvalidity claim comes from a 4-year longitudinal study, in which changes in memory performance were found not to correlate with self-reports of decline (Taylor, Miller, & Tinklenberg, 1992).

There are, however, other variables that consistently correlate with frequency of memory complaints. One such variable is the presence of depressive symptoms (Blazer et al., 1997; Collins & Abeles, 1996; Derouesne, Alperovitch, Arvay, & Migeon, 1989; Feher et al., 1994; Grut et al., 1993; Kahn et al., 1975; Ponds, Commissaris, & Jolles, 1997; Schmand, Jonker, Geerlings, & Lindeboom, 1997; but see Crock, Feher, & Larrabee, 1992). Most researchers imply that depression has an impact on memory complaints, rather than the other way around (e.g., Barker, Prior, & Jones, 1995; Bazzargan & Barbe, 1994). One possible reason for this is that depression is often related to concentration difficulties and to slower information processing, and these deficits may in turn lead to objective memory problems (La Rue, 1992). Insofar as the individual picks up these signs of diminished functioning, memory complaints may result.

On the other hand, one could argue equally well for the inverse relation, namely the situation in which memory complaints lead to enhanced feelings of depression. Maybe memory complaints (whatever their origin) are then seen by the subject as a foreboding of worse memory trouble to come, or even as a sign of impending dementia. In a 2-year longitudinal study, Tobiansky, Blizard, Livingston, and Mann (1995) indeed found that memory complaints at the first time of measurement were associated with a higher risk for depression at the second point in time. About 1 out of 4 persons with memory complaints in this study eventually ended up with a diagnosis of either depression or dementia.

Another affective variable that has been found to correlate with memory complaints is anxiety, and more specifically anxiety about possible dementia (e.g., Commissaris et al., 1993; Hultsch, Hertzog, Dixon, & Davidson, 1988). In this case, it is more likely to assume that the complaints cause anxiety, rather than the other way around.

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When a person experiences memory problems, be they real or imagined, and especially if these perceived problems are distressing, coping mechanisms, problem-focused or emotion-focused, might be triggered (Folkman, 1984; Lazarus, 1966, 1991). Instrumental or problem-focused coping (Lazarus, 1966, 1991) is action oriented. It aims at actively eliminating or alleviating the underlying problem, in this case the supposed underlying memory deficit. An obvious type of instrumental coping would be to try to improve memory performance by applying efficient external and internal memory strategies. There is some evidence that older adults indeed spontaneously engage in such activities. For instance, Ponds, Bruning, and Jolles (1992) found that older people who chose to participate in memory training not only complained more about memory failures but also were more likely to use internal strategies than were non-complainers, even prior to the training program.

Emotion-focused or cognitive coping (Lazarus, 1966, 1991) involves internal restructuring rather than acting. It is aimed at reducing the emotional distress associated with the problem, without actually changing the distressing situation. According to coping theories, such emotion-focused coping will be particularly important when the individual perceives the situation as being uncontrollable (Folkman, 1984). One mechanism for cognitive coping might be social comparison, that is, one tries to find out whether selected age peers experience the same problems. Such social comparison is a coping technique older adults often use with regard to health issues or for coping with the aging process in general (Dittmann-Kohli, 1990; Heidrich & Ryff, 1993). In an exploratory interview study about memory complaints, Swaegers (1996) indeed found that almost all of her interviewees (28 out of 30) engaged in such explicit social comparison by sharing instances of personal memory failures with friends and acquaintances of similar age. Very often, episodes of memory failure were told as funny anecdotes, presumably to defuse them of possibly negative meaning for the self.

Clearly, then, memory complaints do not occur in a psychological vacuum. They are embedded in an affective and cognitive context, and people might act on them by using a diversity of coping mechanisms. It seems that for a good understanding of the function and significance of memory complaints in later adulthood, one needs to take this embeddedness into account.

Of course, the concept of memory complaint in and of itself is slightly more complex than we have suggested here. For instance, the two scales for memory complaints in adulthood most often used in research, the Memory Functioning Questionnaire (MFQ; Gilewski, Zelinski, Schaei, & Thompson, 1983) and the Metamemory In Adulthood Scale (MIA; Dixon & Hultsch, 1984), both consist of different subscales that can be separated by factor analysis (Hultsch, Hertzog, Dixon, & Davidson, 1988). For instance, the MIA has different subscales for Capacity (the perception of memory capacities as relevant to certain tasks; this scale can also be interpreted as the inverse of frequency of memory complaints), Change (the perception of one's own memory as being stable or as subject to decline), and Locus of Control (the perceived control one has over one's own memory abilities). The original authors consider these three scales as indicative of a single, higher order construct labeled Memory Self-Efficacy (MSE). Apart from the MSE scales, the MIA also probes for knowledge about basic memory processes (Task), Strategy use, memory-related Anxiety, and perceived importance of a good memory in particular situations (Achievement).

Thus, there is complexity, both at the level of memory complaints themselves and at the level of its correlates. The present study was designed to investigate the mechanisms of multidimensionality and the relation between complaints and their context of coping and affect. In conducting this analysis, we adopted a systemic approach, that is, we investigated the flow of influence between variables by conducting a path analysis on correlational data. The variables included were those mentioned in the literature review above, namely (a) memory complaints, (b) anxiety and depression/dysphoria as affective correlates (a broader index of psychological well-being was included as well), and (c) strategy and social comparison as coping mechanisms. Memory complaints were measured by the MSE subscales of the MIA. Because both Commissaris and colleagues (1993) and Swaegers (1996) suggested that fear of dementia might be distinct from anxiety about memory in general, a self-constructed Dementia Anxiety scale was included. Because the primary determinant of coping is the distress experienced by a stressor (Lazarus, 1966), we also included a self-constructed Seriousness of Complaint scale, which probed for distress caused by memory problems in both private and social contexts.

To our knowledge, the present study is the first to use such a broad variety of measures. Hence, we considered this study as mainly exploratory and treated the data as such. No preconceived structure was imposed on our path analysis. Rather, we used exploratory fitting procedures to examine the relationships between the variables.

**Methods**

**Participants**

A total of 179 Dutch-speaking adults participated in this study. Mean age was 70.1 years (SD = 7.7); the youngest participant was 49 years old, the oldest 97. Participants were mainly recruited through four community organizations specializing in adult education and other forms of community service for older adults in the Belgian province of Limburg (88% of the participants); Nathalie Geraerts recruited the remaining 12% through the snowball method. To guarantee anonymity, no names or other identifying information appeared on the questionnaires or envelopes and no listing of names of participants was kept. Women comprised 51% of the sample. The av-
erage level of education completed was ninth grade, but the full range between not having completed primary school to having a university degree was present in the sample. The large majority (94%) of the participants were living independently in the community; the remaining 6% were living in adult care facilities.

**Instruments**

Abridged versions of the MIA subscales of Capacity, Change, Locus of Control, Anxiety, and Strategy were used (Dixon & Hultsch, 1984; the shorter forms were developed by Ponds & Jolles, 1996; we adopted their Dutch translation). The Capacity and Change scales tap perceived memory problems. The Capacity scale measures the perception of memory capacities as by rating of performance on given tasks (e.g., “I am good at remembering names”). The Change scale measures the perception of memory abilities as generally stable or subject to long-term decline (e.g., “The older I get, the harder it is to remember things clearly”). The Locus of Control scale measures perceived personal control over remembering abilities (e.g., “Even if I work on it, my memory ability will go downhill”; high scores denote internality of locus of control. The Anxiety scale taps feelings of stress related to memory performance (e.g., “I do not get flustered when I am put on the spot to remember new things”). The Strategy scale measures knowledge and use of strategies for improving memory performance (e.g., “Do you write appointments on a calendar to help you remember them?”). All items were scored on a 5-point scale denoting frequency of usage (for the Strategy scale) or degree of agreement (for all other scales).

We constructed our own 5-point agreement scales for anxiety about dementia (five items in the final version), social comparison (five items in the final version), and perceived seriousness, indicating the degree to which memory problems were perceived as annoying either in private life (seven items in the final version) or in social situations (eight items in the final version). Items for the final versions of these scales are listed in the Appendix. The items were derived from an interview study with 30 older adults (Swaegeers, 1996) and from preliminary interviews by Nathalie Geraets with 20 older adults. A pilot version of the total questionnaire was presented to an independent sample of 30 older adults, and wording of questions and number of items were adapted according to suggestions from those participants.

The Center for Epidemiologic Studies-Depression Scale (CES-D) questionnaire (Radloff, 1977) was used for measuring dysphoria. This scale has a 4-point range. This scale was used for correlational analysis; it was not intended as a screening instrument for depression. (The reader may note that 90% of our sample scored below the cut-off score for possible depression.) The Life Satisfaction Index (LSI; Form A; Neugarten, Havighurst, & Tobin, 1961; this scale uses an agree–disagree answer format) was used as a global measure of life satisfaction. This instrument has been explicitly constructed to measure general well-being in old age. Like the CES-D, the LSI was used as a covariate of memory complaints rather than as a screening instrument.

The final version of our questionnaire consisted of 124 items. The CES-D and LSI items were presented at the end of the list to avoid contamination of possible dysphoric feelings induced by these scales. The items for the meta-memory and coping scales were presented in random order and were thus not grouped by subscale.

**Results**

**Psychometric Issues**

Means and standard deviations for the scales are presented in Table 1. Cronbach’s alpha coefficients were used to determine internal consistency of the MIA abridged subscales in our sample. As expected, these proved satisfactory, with the exception of the Locus of Control subscale (Capacity, 13 items, $\alpha = .83$; Change, 11 items, $\alpha = .89$; Anxiety, 12 items, $\alpha = .89$; Locus of Control, 7 items, $\alpha = .49$; Strategy, 16 items, $\alpha = .84$).

In a further effort to refine our measurement of coping techniques, we divided the MIA Strategy subscale into an external and internal scale (examples of external strategies are using notes and making lists; examples of internal strategies are concentration and imagery). The scree plot of eigenvalues in a principal component analysis confirmed the presence of two factors in the Strategy subscale. These could be easily identified with internal and external strategies. The Strategy (Internal) subscale thus contained eight items and had a Cronbach’s alpha of .76; the Strategy (External) subscale contained eight items and had a Cronbach’s alpha of .80.

The self-constructed subscales showed an internal consistency that was quite satisfactory, with the exception of the Social Comparison subscale (Dementia Anxiety, 5 items, $\alpha = .83$; Social Comparison, 5 items, $\alpha = .65$; Seriousness (Private), 7 items, $\alpha = .70$).

<table>
<thead>
<tr>
<th>Table 1. Descriptive Statistics for All Scales</th>
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<tbody>
<tr>
<td>Scale</td>
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<tr>
<td>-------</td>
</tr>
<tr>
<td>Capacity</td>
</tr>
<tr>
<td>Change</td>
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<tr>
<td>Anxiety</td>
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<tr>
<td>Locus of control</td>
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<tr>
<td>Strategy (internal)</td>
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<tr>
<td>Strategy (external)</td>
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<tr>
<td>Seriousness (private)</td>
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<tr>
<td>Seriousness (social context)</td>
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<tr>
<td>Dementia anxiety</td>
</tr>
<tr>
<td>Social comparison</td>
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<tr>
<td>CES-D</td>
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<tr>
<td>Life satisfaction index</td>
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</table>

Note: CES-D = Center for Epidemiologic Studies-Depression Scale.
An interesting observation was that scores on our Dementia Anxiety scale turned out to be unrelated to the individual's personal context. A t test revealed that the scores for dementia anxiety were not significantly higher for participants who indicated that their partner, a friend, or an acquaintance suffered from dementia syndrome (mean score = 2.37; n = 88) than for those who did not (mean score = 2.31; n = 91), t(177) = 0.39, ns. Within the group of respondents who indicated that they personally knew a demeaned person, dementia anxiety did not covary with degree of acquaintance (i.e., partner or spouse, family member, friend, acquaintance, or other), F(4, 81) = 1.19, MSE = 0.646, ns. In the present sample, the CES-D scale was found to have an internal consistency of .70; the LSI of .72.

Given the relatively large number of scales, a data reduction was attempted by grouping similar scales. To assess similarity, we conducted a scaling analysis using the ALSCLAL program. Euclidean distances at the ordinal level of measurement were used for scaling. A two-dimensional solution captured the data quite well (Kruskal’s Stress = .066; R² = .99). This solution is depicted in Figure 1.

Interpreting data from any data reduction technique always involves judgment calls. We decided to group scales that were close together in the two-dimensional scaling space and that shared some psychologically meaningful attributes. More specifically, we decided to pool the two anxiety scales (i.e., AnxD and MIA-Anx in Figure 1; r = .63) into one Anxiety scale, the two seriousness scales (i.e., SerSoc and Ser-Priv in Figure 1; r = .80) into one Seriousness scale, the two strategy scales plus the social comparison scale (i.e., MIA-StrIn, MIA-StrEx, and SocC in Figure 1; median r between scales was .42) into one Coping scale; and the CES-D and LSI scales into one Well-Being scale (note that, although the latter two scales were not scaled very closely together, they did occupy a distinct segment of the two-dimensional space; r = .34; in the pooled scale, higher scores denote higher well-being). Scales were pooled by first transforming the subscale scores into z scores and then averaging those for each scale (Rushton, Brainerd, & Pressley, 1983).

**Linear Structural Models**

LSLREL 8 (Jöreskog & Sorbom, 1993) was used for path analysis on the correlation matrix. Variables included in the model were (in alphabetical order) anxiety, coping, MIA capacity, MIA change, MIA locus of control, seriousness, and well-being. The correlation matrix of the variables is presented in Table 2. The results of the path analysis are standardized and, hence, the relative size of paths can be examined.

Because the present study is mainly exploratory in nature, we imposed no constraints on the model to be fitted. Rather, we started from an arbitrary, presumably theoretically neutral, starting configuration, which was then progressively relaxed using the modification indices offered by the LISREL program as guides. This starting model should implicate all variables to make exploratory fitting possible. To achieve this, we opted for a fanning model as our baseline model, that is, we started from a model in which a single precursor variable was assumed to influence all others. In our choice of precursor variable, we let ourselves be guided by the literature. As stated in the introduction, there are indications that memory self-efficacy influences anxiety and well-being, rather than the other way around; obviously, coping and perceived seriousness should be posterior to memory self-efficacy, because these are, by definition, reactions to the perception of memory performance. Hence, we decided to try three fanning models, one with each of the MIA self-efficacy scales as the precursor. Eventually, we adopted the starting model fanning out from locus of control, because the final model derived from this starting configuration turned out to be more psychologically sound than the other two models. For instance, there was a direct negative path between capacity and anxiety in the final version of the model starting from change as the fanning variable, indicating that more complaints would lead to lower levels of anxiety; and there were many recursive paths in the model fanning out from capacity.

![Figure 1. Two-dimensional scaling solution for the memory complaint, coping, and well-being variables. MIA = Metamemory in Adulthood Questionnaire; Cap = Capacity; Anx = Anxiety; Ch = Change; LoC = Locus of Control; StrEx = Strategies (External); StrIn = Strategies (Internal); AnxD = Dementia Anxiety; Ser-Priv = Seriousness (Private); SerSoc = Seriousness (Social context); SocC = Social comparison; CES-D = Center for Epidemiologic Studies–Depression Scale; LSI = Life Satisfaction Index.](image)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus of control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Change</td>
<td>-.02</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Capacity</td>
<td>.36</td>
<td>.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
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<td>.71</td>
<td>.41</td>
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<tr>
<td>Seriousness</td>
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<td>.60</td>
<td>.23</td>
<td>.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coping</td>
<td>.40</td>
<td>.49</td>
<td>.05</td>
<td>.42</td>
<td>.58</td>
<td></td>
<td></td>
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<tr>
<td>Well-being</td>
<td>.09</td>
<td>.02</td>
<td>.16</td>
<td>.09</td>
<td>.05</td>
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### Table 3. Fitting History of the Systemic Model for Relating Memory Complaints, Coping Variables, and Well-Being

<table>
<thead>
<tr>
<th>Step Taken</th>
<th>$\chi^2$</th>
<th>df</th>
<th>SRMR</th>
<th>GFI</th>
<th>AGFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline model</td>
<td>410.13</td>
<td>15</td>
<td>.30</td>
<td>.55</td>
<td>.16</td>
</tr>
<tr>
<td>Free anxiety $\rightarrow$ seriousness</td>
<td>290.20</td>
<td>14</td>
<td>.27</td>
<td>.67</td>
<td>.34</td>
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<tr>
<td>Free change $\rightarrow$ anxiety</td>
<td>167.77</td>
<td>13</td>
<td>.21</td>
<td>.80</td>
<td>.57</td>
</tr>
<tr>
<td>Free change $\rightarrow$ coping</td>
<td>105.44</td>
<td>12</td>
<td>.15</td>
<td>.87</td>
<td>.71</td>
</tr>
<tr>
<td>Free capacity $\rightarrow$ change</td>
<td>48.18</td>
<td>11</td>
<td>.07</td>
<td>.94</td>
<td>.84</td>
</tr>
<tr>
<td>Free seriousness $\rightarrow$ coping</td>
<td>30.05</td>
<td>10</td>
<td>.05</td>
<td>.95</td>
<td>.87</td>
</tr>
<tr>
<td>Free change $\rightarrow$ seriousness</td>
<td>18.68</td>
<td>9</td>
<td>.05</td>
<td>.97</td>
<td>.91</td>
</tr>
<tr>
<td>Free coping $\rightarrow$ well-being</td>
<td>13.71</td>
<td>8</td>
<td>.04</td>
<td>.98</td>
<td>.93</td>
</tr>
<tr>
<td>Delete locus of control $\rightarrow$ well-being</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>and locus of control $\rightarrow$ anxiety</td>
<td>13.90</td>
<td>10</td>
<td>.04</td>
<td>.98</td>
<td>.94</td>
</tr>
<tr>
<td>Free capacity $\rightarrow$ well-being</td>
<td>8.19</td>
<td>9</td>
<td>.02</td>
<td>.99</td>
<td>.96</td>
</tr>
</tbody>
</table>

Notes: SRMR = standardized root mean square residual; GFI = goodness of fit index; AGFI = adjusted goodness of fit index.

Starting from the baseline model with locus of control as the precursor variable, we fitted the model by adding paths, one at each step, as indicated by the LISREL program modification indices. When modification indices did not promise any more significant improvement of the model, paths that were nonsignificant were deleted. The fitting history is made explicit in Table 3. The final model is depicted in Figure 2. This model provided an excellent fit to the data, $\chi^2_{(10, \ n=179)} = 8.19, \ p = .52$, standardized root mean square residual = .022, goodness of fit index = .99, adjusted goodness of fit index = .96. Table 4 provides the standardized total effects of the variables on each other. The total effect of one variable on another is the sum of all direct and indirect effects from the former variable to the latter through all possible paths linking the two. In Table 4, the variables from which the effect originates are placed in the column, and the variables receiving the effect are placed in the rows. Thus, for instance, the .36 in the first column, second row, means that the Capacity scale receives a total effect of .36 from the locus of control variable.

### Discussion

The main objective of this study was to look for systemic relations among memory complaints, styles of coping with memory complaints, and well-being in older adults. The primary analysis consists of an exploratory path analysis.

A global structure indeed emerged from our analysis, as can be seen in Figure 2. More specifically, we found a three-phase structure in the data. The reader should note that this structure was not imposed beforehand on the data. Rather, it emerged from an exploratory, nontheoretical analysis.

First, it appears that the perception of memory complaints (as measured through the MIA self-efficacy scales Locus of Control, Change, and Capacity) set an appraisal mechanism in motion: More complaints lead to a heightened feeling of memory-related anxiety and to an increase in perceived seriousness of problems. The memory complaint variables were clearly found to be anterior to the other variables, that is, the memory self-efficacy variables were either found to be prime movers (i.e., they did not receive input from any of the other variables) or they received input only from other self-efficacy variables and then transmitted that input to the appraisal process.

Second, this appraisal mechanism leads the individual to engage in coping behaviors (which was measured in our scales by a mixture of internal and external mnemonic strategies and social comparison). Note that appraisal seems to be a truly necessary mechanism here: The coping variable does not receive any direct input from frequency of complaints (i.e., capacity); its input from complaints occurs indirectly through perception of change, increased anxiety, and perceived seriousness of complaints. In other words, coping with memory complaints is not just...
Table 4. Total Standardized Effects of Variables on Each Other According to the Final Path Model

<table>
<thead>
<tr>
<th>Outcome of Influence</th>
<th>Locus of Control</th>
<th>Change</th>
<th>Capacity</th>
<th>Anxiety</th>
<th>Seriousness</th>
<th>Coping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>-.02</td>
<td>-.56</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Capacity</td>
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<td></td>
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</tr>
<tr>
<td>Anxiety</td>
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<td>.71</td>
<td>-.40</td>
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<tr>
<td>Seriousness</td>
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<td>.51</td>
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<tr>
<td>Coping</td>
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<td>-.28</td>
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<td>.06</td>
<td>.20</td>
</tr>
<tr>
<td>Well-being</td>
<td>.14</td>
<td>.10</td>
<td>.12</td>
<td>.03</td>
<td>.06</td>
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</tbody>
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Note: Cells with zero effects (no influence) are left blank.

Driven by a subjective experience of a memory that is functioning less than perfectly but also by an affective and cognitive appraisal of that experience: how much concern the memory problems cause and how serious they seem. The perception of change (as opposed to the mere frequency of failures) seems to be crucial here. This can be gathered from Table 4: The relative contribution of change to anxiety, seriousness, and coping is larger than the contribution of the two other self-efficacy variables. Thus, the processes of appraisal and coping are set in motion through the perception of change in memory functioning, rather than by complaints in and of themselves.

Third, coping behavior influences well-being (i.e., a mixture of life satisfaction and the absence of dysphoria). In fact, in our model, coping, together with frequency of complaints, is the largest determinant of well-being. Well-being is found to be purely an outcome variable here: It is influenced by other variables in the model, but it does not transmit any of that influence to any other variable. Thus, our results replicate the well-established finding that memory complaints are related to well-being (Blazer et al., 1997; Collins & Abeles, 1996; Derouesne et al., 1989; Feher et al., 1994; Grut et al., 1993; Kahn et al., 1975; Ponds, Commissaris, & Jolles, 1997; Schmand et al., 1997): People with lower levels of memory-related anxiety and a lower frequency of complaints (as evidenced by a higher score on the Capacity scale) score higher on our well-being composite. (Note, however, that there is a paradoxical effect in that perception of negative change seemingly leads to higher well-being. This may be due to the link between perception of change and coping on the one hand and the link between coping and well-being on the other hand.) Our analysis, however, also suggests a direction of influence: The influence goes from memory complaints to well-being (mediated through appraisal and coping), rather than the other way around. Again, the reader should note that this direction of influence was not imposed on the data beforehand. This flow of influence from complaints to well-being runs contrary to the direction that is sometimes posited in the literature (Blazer et al., 1997; Collins & Abeles, 1996; Derouesne et al., 1989; Feher et al., 1994; Kahn et al., 1975; Schmand et al., 1997)—many researchers assume that dysphoria leads to more complaints. Our finding is, however, consistent with the longitudinal analysis by Tobiansky, Blizard, Livingston, and Mann (1995).

In summary, the main finding from this study is that there is a general three-phase structure to memory complaints and their context of coping and affect: Memory perception influences coping behavior through an appraisal mechanism, and these two variables in turn influence well-being.

The finding that there may be a causal link between complaints and dysphoria strongly suggests that memory complaints are much more central to the aging self than most researchers assume. It is well known that a decline in physical health is a major concern for older adults (e.g., Dittmann-Kohli, 1998). Maybe perceived memory decline is seen as a sign of declining mental health and thus plays a similar role as physical complaints. Moreover, memory functioning may be quite vital for the self. The sense of self is highly connected to the store of personal memories (Damasio, 1994)—one partly is what one remembers oneself to be—and the potential loss of these memories is then a serious threat to the self. This is consistent with our finding that the perception of memory loss in old age is intimately connected with the fear of impending dementia. Dementia can be considered the ultimate loss of self, and it is probably the mental health hazard associated most closely with old age.

Of course, our data do not support the inference of strong causal interpretations (interventional or longitudinal data are necessary to ascertain causality), but at the very least, our analysis suggests that memory complaints in old age may not be as innocuous, transient, and inconsequential as they sometimes seem to the practitioner. Rather, they might be quite central to mental health in old age and may well cause dysphoric symptoms and lack of zest in life.

Second, in accordance with the large body of general literature on coping, we found that a higher frequency of memory complaints and the perception of change lead to increases in coping behavior. Thus, older adults experiencing memory problems do not just sit and complian, they actively cope with the problem. This immediately implies that older adults (or at least active, community-oriented older adults such as those included in the present sample) do have a repertoire of coping behaviors at their disposal; they are resilient with regard to memory problems. This is amplified by our finding that the three
coping mechanisms investigated were intercorrelated. This means that the older adults in our sample who did cope with perceived memory problems did so by using all mechanisms at their disposal: cognitive coping through social comparison and instrumental coping through the use of external and internal strategies. As should be expected, coping has a beneficial effect, that is, of all the variables included in the model, it has the largest total impact on well-being. Thus, even though in this study, we remain agnostic as to the instrumental effects of coping for alleviating memory problems (as opposed to complaints), we do see that the sheer act of coping makes people feel better.

One last important finding, important also because it points at a target for interventions, is that memory-related locus of control occupies a central place as an antecedent in our model. Particularly noteworthy is the rather strong link between locus of control and coping, both direct and indirect. People with a more internal locus of control tend to be more inclined toward applying some form of coping mechanism, which then in turn leads to enhanced well-being. Previous research has shown that in old age a more internal locus of control (as opposed to a more external locus of control) is associated with better performance of memory tests (Amrhein, Bond, & Hamilton, 1999; Hertzog, McGuire, & Lineweaver, 1998). The mediational mechanism appears to be a deficiency in strategy use and/or memory monitoring (Amrhein et al., 1999; Hertzog et al., 1998; see also Riggs, Lachman, & Wingfield, 1997). This is hardly surprising: By definition, persons with a more internal locus of control believe they have control over their memory abilities; consequently, they may then be more inclined to look for and/or apply more efficient strategies to cope with memory loss; persons with an external locus of control might just give up, and may even be disinclined to monitor performance. What the present data add to that general picture is that we found that self-perceived seriousness of memory complaints mediates between locus of control and coping behavior. Apparently, older adults with more internal locus of control rate their memory problems as more serious; this perceived seriousness in turn leads to more coping behavior. One other study has found that, at least in women, a more internal locus of control is protective of depressive symptoms when experiencing cognitive decline (van den Heuvel, Smits, Deeg, & Beekman, 1997). Our study suggests that coping behavior is a mediating mechanism between locus of control and dysphoria. Given this finding, it seems that fostering feelings of internal control for memory functioning is an ideal focus for memory- and well-being-related interventions (Floyd & Scogin, 1997; Verhaeghen, Van Ranst, & Marcoen, 1993).

On a lesser note, we found that a number of concepts measured were less differentiated than we had originally assumed. We had postulated that worrying about dementia and general anxiety about memory functioning would be distinguishable constructs. The scaling analysis shows that this is not the case. In effect, these two scales were highly correlated. Therefore, it seems that anxiety about one's own memory functioning in old age and anxiety about impending dementia are highly similar concerns. Consequently, it seems very likely that anxiety about dementia is an outcome of worrying about one's memory in general, rather than one triggered by specific events or circumstances, such as personally knowing someone who suffers from Alzheimer's disease. This line of reasoning is consistent with the observation that anxiety about dementia did not covary with knowing or not knowing a person suffering from the disease, or, if one knows an Alzheimer's patient, with the degree of closeness to that person. Likewise, it appears that the initial distinction we made between perceived seriousness of failures as experienced in social contexts and as experienced in private life was not warranted. Hence, there seems to be a single construct of perceived seriousness, regardless of the context in which the memory failure originates. In other words, an audience of one (i.e., the self) can very well suffice to make a memory lapse a serious and threatening incident.

Finally, some limitations of the present study should be noted. First, although sample size was not particularly small (179 adults), a replication on a larger sample would be needed before complete confidence in the results can be established. In such replication, the findings of the four-phase structure of complaints, appraisal, coping, and well-being should be tested more explicitly. Second, every study is limited by the instruments and sample used. Although all our scales proved quite reliable and interpretable, results might be different when different scales are used or when additional constructs are measured. Our sample was a convenience sample and, hence, was not completely representative of the general population. For instance, men were overrepresented, and the sample is quite diverse in its age structure. Third, even though path analysis in a cross-sectional sample can hint at causal structures, longitudinal or experimental data are needed before firm causal links can be inferred.

To summarize, we found that in old age, there is indeed a link between memory complaints, coping behavior, and well-being. More specifically, the perception of memory problems as more serious sets coping mechanisms in action, and coping behavior influences well-being positively. Locus of control appears to be the driving force for coping behavior and may thus be a good focus for interventions pertaining to memory complaints.

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Appendix

English Translation of Items for the Dementia Anxiety Scale (α = .83)

Sometimes, for instance when I repeatedly forget things during the day, I am worried that I might develop dementia.

When I notice that I have trouble remembering things, I am afraid this might be the first step toward dementia.

The more I forget, the more I am worried that I might become demented.

I worry a lot about developing dementia.

I find it annoying when I forget something; it makes me afraid of becoming demented.

English Translation of Items for the Seriousness Scale (α = .90)

I find it annoying when I am telling something to someone and I cannot recall a name.

Whenever other people are present, I get nervous when I forget something; as soon as they are gone, I remember it again.

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I find it annoying when I meet someone and I can't recall that person's name immediately.
I find it annoying when I shop for somebody and I forget to bring something.
I find it annoying when I forget appointments or birthdays or the like.
I find it annoying when I want to tell a story someone else told me and I find that I have forgotten much of it.
When I am with people and I forget something, I get annoyed.
I find it annoying when I go shopping and I forget items.
When someone else points out to me that I forgot something, I get irritated.
I find it annoying when I am telling something and I suddenly don't recall a name or a word.
I am annoyed when I cannot think of the right word.
I find it annoying when I go into the pantry and I don't remember what it is I wanted to get there.

I find it annoying when I cause trouble to others because I forgot something.
It is annoying when I am doing something and I get interrupted and then I don't remember what it was I was doing.
I get annoyed when I repeatedly ask someone the same question.

English Translation of Items for the Social Comparison Scale (α = .65)

I often hear from other people of my own age that they also have trouble with their memory.
I know many people who suffered from memory problems much earlier than I did.
I notice the memory problems people of my own age are having.
Among people of my age, we often make jokes about our memory problems.
At my age, everyone experiences memory troubles from time to time.