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Cross-sectional and Longitudinal Analyses of Everyday Memory Lapses in Older Adults

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Abstract

Everyday memory lapses experienced by older adults (OA) were examined using a daily-diary checklist and retrospective questionnaire. In Experiment 1, 138 younger and 138 OAs indicated the frequency of forgetting of 16 memory lapses, and whether each occurred daily during the course of a week. OAs reported more memory lapses on the questionnaire, but not the daily diary. OAs reported more frequently forgetting names and words, while younger adults had more difficulty with appointments and personal dates. Fewer memory lapses on the daily diary were related to better performance on a laboratory-memory measure for OAs. In Experiment 2, 62 OAs returned for a five-year follow-up and endorsed experiencing more memory lapses on the daily diary compared to baseline, specifically forgetting more names and words, but not the retrospective questionnaire. Daily checklist memory lapses again correlated with the laboratory-memory measure. A daily checklist may be a viable way to assess everyday memory lapses.

Keywords

Aging; Memory; Cognition; Memory complaints; Daily Diary

Memory lapses that commonly occur in older adulthood can have real-world effects ranging from minor inconveniences to more significant consequences (e.g., failure to take medication). Age-related declines in memory performance on laboratory measures have been clearly documented. While laboratory-based memory measures have important diagnostic value, they do not provide information about the specific types of memory lapses (e.g., forgetting names) that older adults are most likely to experience in everyday life. The concept of everyday memory is a reaction to the need to capture ecologically valid instances of remembering (Jones et al., 2011). It distinguishes between memory as it is used in everyday life to functionally meet daily demands (Magnussen & Helstrup, 2007) and memory as it is measured in the laboratory. Examples of everyday memory include remembering grocery items while shopping, remembering the name of an acquaintance, or remembering to make a phone call. To better inform older adults of the cognitive changes that occur as part of the normal aging process and to develop useful compensatory strategies,

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it is important to understand the frequency and significance of memory lapses experienced by older adults in their everyday lives and the types of compensatory strategies used.

For older adults, everyday memory lapses can be considered thematic in that they occur often and predictably (Dixon, Rust, Feltmate, & See, 2007). Clinically and anecdotally, older adults often report experiencing difficulties recalling names and retrieving words. An early study found that older adults commonly reported tip-of-the-tongue and absent-minded errors (Sunderland, Watts, Baddeley, & Harris, 1986). A more recent study found that the most prominent memory failures for older adults were verbal memory errors and errors involving faces, places, and learning new things (Ossher, Flegal, & Lustig, 2013). While general levels of subjective memory complaints have been well studied, particularly among older adults, knowledge about which specific everyday memory lapses older adults most often experience and consider distressing in daily life is lacking (e.g., Ossher et al., 2013; Sunderland et al., 1986).

At present, there is also little comparative data on the everyday memory lapses of younger and older adults. Some studies have found that older adults report fewer complaints (e.g., Jonsdottir, Adolfsdottir, Cortez, Gunnarsdottir, & Gustafsdottir, 2007; Ronnlund, Mantyla, & Nilsson, 2008) or the same frequency of complaints (e.g., Whitbourne et al., 2008) as younger adults, while many other studies have found that older adults report more everyday memory lapses (e.g., Cavanaugh, Grady, & Perlmutter, 1983; Erber, Szuchman, & Rothberg, 1992). A few studies have shown that while the total frequency of everyday memory lapses may not differ between age groups, the frequency of specific types of everyday memory lapses may differ between younger and older adults groups (e.g., Martin, 1986; Reese & Cherry, 2006). For example, younger adults were found to have less difficulty with remembering telephone numbers and names of others, while older adults endorsed fewer difficulties with remembering appointments, paying bills, and taking medication when necessary (Martin, 1986). These findings underscore the importance of examining specific everyday memory lapses.

A common approach in the literature investigating everyday memory lapses is to consider the frequency with which they occur. This approach serves to identify what the problems are but does not necessarily address the relative importance of these problems. The importance of everyday memory lapses can certainly be inferred from how often they occur; however, some frequent everyday memory lapses may have less distressing and serious consequences on everyday life than less frequent everyday memory lapses (Higbee & Manalo, 2006). For example, Burmester, Leathem and Merrick (2015) found that older adults spontaneously reported that forgetting names of other people was almost three times more common than other everyday memory lapses but was only moderately distressing compared to other everyday memory lapses. Furthermore, when comparing total distress scores across older and younger adults, studies have found that older adults are generally less distressed by their everyday memory lapses compared to younger adults (e.g., Erber et al., 1992; but see Cavanaugh et al., 1983). However, few studies have examined the specific everyday memory lapses rated as most concerning to both older and younger adults.

Research indicates that healthy older adults respond to subtle age-related memory changes by both knowingly and unknowingly implementing compensatory strategies (e.g., Dixon & de Frias, 2007; de Frias, Dixon, & Backman, 2003). Compensatory strategies are commonly divided into internal (e.g., imagery, mnemonics, rehearsal) and external (e.g., to-do lists, supportive technology, outsourcing) techniques. Although older adults frequently report using compensatory strategies to assist with everyday life (e.g., Cavanaugh et al., 1983), there remains a need to better understand the types of compensatory strategies being used in the everyday environment by older adults.

Due to the inherent difficulties of recording everyday memory lapses and compensatory strategy use, only a small body of literature currently exists (Unsworth, McMillan, Brewer, & Spillers, 2013). Several methods have been used to measure everyday memory lapses, each with advantages and disadvantages. Compared with traditional laboratory-based measures, measures of everyday memory include self-report questionnaires (e.g., Cognitive Failures Questionnaire, CFQ, Broadbent, Cooper, Fitzgerald, & Parkes, 1982; Everyday Memory Questionnaire, EMQ, Sunderland, Harris, & Baddeley, 1983; Memory Functioning Questionnaire, MFQ, Zelinski, Gilewski, & Anthony-Bergstone, 1990) and simulated everyday memory tasks completed within the laboratory (e.g., learning a grocery list, remembering a name, recognizing a face; Rivermead Behavioral Memory Test, Wilson, Cockburn, Baddeley, & Hiorns, 1989; Computerized Everyday Memory Battery, Larrabee & Crook, 1988). Although these simulated everyday tasks have the advantages of standardization and presumably enhanced ecological validity, they do not delineate underlying factors of impaired performance and often use procedures better designed to test ability limits in an artificial environment rather than challenges typical of everyday life (Makatura, Lam, Leahy, Castillo, & Kalpakjian, 1999; Ossher et al., 2013). Furthermore, compensatory strategies used while completing performance-based measures in the laboratory may not necessarily be used in the real-world setting. In contrast, self-report questionnaires typically assess the frequency and severity of everyday memory lapses as well as other factors such as compensatory strategy use, self-efficacy, and metamemory. However, they often assess for only general memory beliefs using large time frames and are prone to influences from stereotypes, mood, and personality (Ossher et al., 2013). Most of our knowledge of age-related everyday memory lapses has come from self-report questionnaires.

Typically the data from laboratory and self-report measures of everyday memory lapses is reported in general categories or total scores of errors while omitting potentially useful information about frequencies and seriousness of specific memory errors. An alternative method for measuring everyday memory lapses is to have individuals record in a memory diary daily memory lapses that occur. Diary methods are sharply contrasted from self-report questionnaires in which people's retrospective estimates of features of typical forgetting experiences depend largely on judgment and long-term memory (Crovitz, Cordon, Daniel, & Perlman, 1984). These methods may provide more objective information by capturing more short-term or immediate recordings of everyday memory lapses (Crovitz et al., 1984). Diary methods have been successfully used to capture everyday memory lapses in both younger and older adults (e.g., Cavanaugh et al., 1983; Crovitz & Daniel, 1984; Reason,

1979; Terry, 1988; Unsworth, McMillan, Brewer, & Spillers, 2012, 2013; Whitbourne et al., 2008).

Although several cross-sectional studies have examined everyday memory lapses in older adults, to our knowledge, no study has examined and compared the frequency of specific everyday memory lapses over time with an older adult population. In Experiment 1, we used a retrospective questionnaire and a daily diary checklist that was completed over the course of a week to examine the types and frequencies of everyday memory lapses experienced by both older and younger adults. In Experiment 2, we sought to assess changes in the types and frequencies of everyday memory lapses for older adults over a 5-year follow-up. In both experiments, we also examined how serious participants considered each type of everyday memory lapse and their self-reported use of compensatory strategies with a retrospective questionnaire.

Another goal of the current study was to examine the relationship between everyday memory lapses and individual differences in laboratory memory performance. Findings showing that self-reported complaints of memory problems are related to laboratory memory performance have been mixed, when measured both concurrently (e.g., Dux et al., 2008; Osher et al., 2013; Whitbourne et al., 2008) and longitudinally (e.g., Parisi et al., 2011; Lane & Zelinski, 2003; Rickenbach, Almeida, Seeman, & Lachman, 2014; Zelinski, Gilewski, & Schaie, 1993). While longitudinal studies have documented declines in objectively measured memory with both normal and pathological aging, it is unclear whether changes in laboratory measured memory are associated with greater reported everyday memory lapses. In both Experiments 1 and 2, we examined whether those older adults who performed more poorly on a laboratory memory measure also reported experiencing more everyday memory lapses.

Experiment 1

The purpose of Experiment 1 was to (a) better understand the types and frequencies of everyday memory lapses that older and younger adults experience in their everyday lives using both a retrospective questionnaire and a daily diary, (b) determine which everyday memory lapses both older and younger adults consider most significant, (c) examine compensatory strategy use, and (d) examine the relationship between everyday memory lapses, as measured by both retrospective questionnaire and daily diary, and laboratory memory performance for both older and younger adult groups.

Method

Participants—Participants included 138 community-dwelling older adults ($M = 70.43$, $SD = 7.42$) and 138 younger adults ($M = 20.43$, $SD = 2.02$). Older adult participants were recruited through a mailing to alumni, faculty, and staff of Washington State University (WSU), or through local volunteer and senior citizen organizations. Older adult participants functioned independently in the community and did not meet Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) dementia criteria (American Psychiatric Association, 2000) at either baseline or follow-up. Other exclusionary criteria included history of substance abuse, brain surgery, cerebrovascular or cardiovascular accident, brain

damage sustained earlier from a known cause, severe psychiatric disorder, or serious health problems. Younger adults were recruited through the WSU psychology department subject pool and received course credit. Older adults were compensated for parking and given a report documenting their cognitive performances.

Measures

Memory Functioning Questionnaire (MFQ) (Gilewski, Zelinski, & Schaie, 1990)

Retrospective questionnaire: Everyday memory lapses were assessed with the MFQ, a 64-item self-report questionnaire that assesses various aspects of memory through a general rating of memory problems and 4 factor scales: Frequency of Forgetting, Seriousness of Forgetting, Retrospective Functioning, and Mnemonics Usage. The Retrospective Functioning scale was not used because it is not relevant for younger adults (e.g., How is your memory compared to the way it was 20 years ago? When you were 18?). The factor scales used a 7-point Likert scale from 1 (*always* or *very serious*) to 7 (*never* or *not serious*). For the purposes of this study, only 16 items of both the 18-item Frequency of Forgetting and Seriousness of Forgetting factor scales were included. The items “forgetting something on a test” and “losing the thread of thought in public speaking” were not included as these items were deemed significantly less likely to occur in the everyday lives of older adult participants compared to the younger college students. Scores from the 16 items making up both factor scales were averaged to derive total mean frequency of forgetting and seriousness of forgetting scores, with higher scores indicating better perceived memory functioning or less perceived seriousness/significance of everyday memory lapses. The eight items from the Mnemonics Usage scale were also averaged to derive a mean usage of compensatory strategies, with lower scores indicating greater compensatory strategy use.

Daily diary: The 16 items included in the Frequency of Forgetting retrospective questionnaire were included in the daily diary. Participants were instructed to indicate each day which of the 16 everyday memory lapses occurred using a yes/no response. The number of everyday memory lapses endorsed each day was averaged across the 7 days to provide a mean daily diary score. Scores could range from 0 to 16 with higher scores indicating a higher number of reported everyday memory lapses. We also calculated the mean number of days in which each everyday memory lapse was reported.

Memory Assessment Scale (MAS) (Williams, 1991): The MAS is a standardized neuropsychological test of memory functioning. It contains 12 subtests and provides three summary scores and a global memory score. The age and education adjusted global memory score (comprised of the list recall, immediate prose recall, visual reproduction, and immediate visual recognition subscales) was used as a measure of objective memory functioning.

Procedures—Participants were administered a standardized neuropsychological battery, divided into two sessions completed one-week apart. Prior to beginning the first testing session, participants completed the standard MFQ. Between testing sessions, for 7 days, participants indicated each evening whether each of the 16 everyday memory lapses

occurred during the course of the day. All study participants completed at least 5 days of the daily diary, with 94.9% of younger adults and 92.7% of older adults completing all 7 days. Missing data was treated as the memory lapse did not occur.

Analyses—Baseline demographics of younger and older adult participants were compared using chi-square and *t*-tests. Group differences on the retrospective memory questionnaire, as well as seriousness of everyday memory lapses and compensatory strategy use, were compared using *t*-tests. As the scores on the daily diary were not normally distributed, the non-parametric Mann-Whitney *U*-test was used to compare group performances. To indicate the relative strength of significant group differences, effect sizes were calculated and are presented in the Tables. Pearson correlations were used to examine the relationships between objective memory performances and everyday memory lapses.

Results

Participants—Older adults were more highly educated, $t(274) = 11.42, p < .001, d = 1.37$, and had higher estimated IQs, $t(270) = -9.00, p < .001, d = 1.09$ ($M = 17.07, SD = 2.55; M = 118.10, SD = 11.56$, respectively), compared to younger adults ($M = 14.31, SD = 1.25; M = 105.92, SD = 10.75$, respectively). There were no significant differences in the gender distribution of the younger (50M, 88F) and older adult groups (51M, 87F), $\chi^2(1) = .02, p = .90$, or age and education corrected laboratory memory performance (MAS Global Memory; younger: $M = 100.54, SD = 12.04$; older: $M = 100.44, SD = 13.40$), $t(267) = .07, p = .95, d = .01$.

Daily diary—Mann-Whitney *U*-tests showed that younger adults and older adults endorsed experiencing a similar average number of everyday memory lapses per day on the daily diary, $U(276) = 9438.50, Z = -.126, r = .01$ (younger: $M = 1.94, SD = 1.32$; older: $M = 1.93, SD = 1.33$). We then examined whether there were group differences in the types of everyday memory lapses experienced over the course of the week using a more conservative significance value of $p < .001$. As seen in Table 1, older adults reported experiencing more days in which they forgot names, $U(276) = 6942.00, Z = -3.95$, and words, $U(276) = 6887.50, Z = -4.08$. In contrast, younger adults reported experiencing more days in which they forgot appointments, $U(276) = 7749.00, Z = -4.03$, and personal dates, $U(276) = 7475.00, Z = -4.57$.

Retrospective questionnaire—On the retrospective questionnaire, older adults reported a higher mean frequency of daily everyday memory lapses than the younger adults, $t(274) = 2.52, p < .05$ (older: $M = 4.83, SD = .79$; younger: $M = 5.13, SD = 1.16$). Examination of group differences in the frequency of each type of everyday memory lapse was completed using a more conservative significance value ($p < .001$) due to the large number of comparisons. As seen in Table 2, compared to younger adults, older adult participants endorsed experiencing more frequent problems with remembering names, $t(274) = 3.99, p < .001$, faces, $t(274) = 5.29, p < .001$, and phone numbers used frequently, $t(274) = 4.54, p < .001$. The younger adults did not report significantly more difficulties than the older adults on any of the everyday memory lapses.

Seriousness ratings—Although not significant, there was a trend for the older adults to rate the occurrence of memory lapses as less serious than the younger adults, $t(274) = -1.88, p = .06, d = .22$ (older: $M = 4.81, SD = 1.27$; younger: $M = 4.50, SD = 1.48$). Both older and younger adult groups endorsed forgetting appointments as the most serious of the 16 everyday memory lapses. This was followed by forgetting names and words for the older adults, and forgetting personal dates and where put something for the younger adults. Interestingly, while older adults considered forgetting names and words as the 2nd and 3rd most significant everyday memory lapses, these everyday memory lapses ranked 12th and 10th in seriousness for the YAs, respectively.

Compensatory strategy use—Older adults reported a higher frequency of compensatory strategy use compared to younger adults, $t(274) = 2.39, p < .05$ (older: $M = 23.62, SD = 8.43$; younger: $M = 26.46, SD = 11.13$). As seen in Table 3, compared to younger adults, the older adults endorsed using more appointment books, $t(274) = 3.46, p = .001$, and grocery lists, $t(274) = 7.04, p < .001$.

Correlations with objective memory—The frequency of self-reported everyday memory lapses as measured by the self-report retrospective questionnaire did not correlate with scores on the MAS for either the older ($r = .10, p = .25$) or younger adult ($r = -.02, p = .78$) participants. In contrast, for older adult participants, there was a significant correlation between scores on the MAS and everyday memory lapses as reported on the daily diary, $r = -.36, p < .001$, suggesting that those with better global memory performances were reporting fewer total everyday memory lapses. This relationship was not significant for the younger adults, $r = .09, p = .30$. Everyday memory lapses as measured by the retrospective questionnaire were associated with everyday memory lapses as assessed by the daily diary for both the older ($r = -.49, p < .01$) and younger adult ($r = -.18, p < .05$) groups.

Discussion

Although the older adults reported experiencing more everyday memory lapses on the retrospective questionnaire compared to younger adults, they endorsed a comparable number on the daily diary. Consistent with previous work (e.g., Adams-Price & Gonzales, 2005; Lovelace & Twohig, 1990; Osborne, 2005), older adults generally reported more difficulties with remembering names, faces and words. In contrast, younger adults generally reported more difficulties with appointments and personal dates. The older adults also self-reported utilizing more compensatory strategies compared to younger adults, and primarily external aids (i.e., appointment books and grocery lists). While external aids can be used to assist with memory for appointments and personal dates (difficulties reported by younger adults) it is more difficult to use such strategies to compensate for word finding and naming difficulties. Furthermore, although forgetting appointments was not ranked as a high occurring everyday memory lapse (14th), older adults rated forgetting appointments as the most significant or serious everyday memory lapse. This is consistent with Burmester et al. (2015) in that the most frequent lapses for older adults are not always the most distressing. Similarly, younger adults also rated appointments as the most significant everyday memory lapse in addition to personal dates. Furthermore, while the retrospective questionnaire and

daily diary were correlated, only the daily diary was associated with laboratory memory performance for the older adults.

Experiment 2

The purpose of Experiment 2 was to (a) examine changes over time in the types and frequencies of everyday memory lapses that older adults experience in their everyday lives, as measured by both retrospective questionnaire and daily diary, and (b) determine compensatory strategy use and which everyday memory lapses older adults considered most significant at a 5-year follow-up. We were especially interested in whether older adults would endorse more frequent everyday memory lapses of the same kind at a five year separation. We also examined the relationship for older adults between baseline and follow-up objective memory performance and follow-up everyday memory lapses.

Method

Participants, Measures, and Procedures—Sixty-two of the OAs from Experiment 1 returned for a 5-year follow-up of neuropsychological testing and again completed the MAS and seven-day memory diary. Of the 76 participants who did not return for follow-up testing, 11.9% had died, 15.3 had moved out of the area, 32.2% were not interested, 13.6% were not able to be scheduled during the study duration, 25.4% were unable to be contacted (e.g., did not answer phone or could not be located), and 1.7% no longer met minimum study requirements (see Experiment 1). Measures and procedures were identical to Experiment 1.

Analyses—Baseline characteristics of older adult returners and nonreturners were compared using chi-square and *t*-tests. Paired samples *t*-tests were used to compare differences at baseline and 5-year follow-up on the retrospective questionnaire, as well as seriousness of everyday memory lapses and compensatory strategy use. As the scores on the daily diary were not normally distributed, the non-parametric Wilcoxon Signed-ranks test was used to compare group performances. To indicate the relative strength of significant group differences, effect sizes were calculated and are presented in the Tables. Pearson correlations were used to examine the relationships between objective memory performances and everyday memory lapses.

Results

Participants

The returning older adults were approximately 4 years younger than the non-returning OAs, $t(136) = 3.18, p < .01$ (see Table 4). There were no differences between the returning and non-returning older adults in education, estimated IQ, total reported everyday memory lapses, MAS score, or gender distribution, $\chi^2(1) = .15, p = .70$.

Daily diary

Wilcoxon Signed-ranks tests showed that older adults self-reported on the daily diary measure an increase in the number of everyday memory lapses being experienced at 5-year follow-up ($M = 2.23, SD = 1.44$) compared to baseline ($M = 1.89, SD = 1.29$), $Z = -1.97, p$

< .05, $r = .25$. Next, we were interested in whether any of the 16 everyday memory lapses were being reported as occurring with greater frequency at follow-up. Given the smaller sample size for this aspect of the study, we set alpha at .05 rather than .001 to keep effect sizes similar to Experiment 1. Wilcoxon Signed-ranks tests showed that older adults reported more days in which they forgot names, $Z = -2.74$, $p < .01$, words, $Z = -2.711$, $p < .01$, and frequently used phone numbers, $Z = -1.98$, $p < .05$, at follow-up compared to baseline (Table 5).

Retrospective questionnaire

Paired samples t -tests showed that participants self-reported experiencing fewer total everyday memory lapses on the retrospective questionnaire at 5-year follow-up ($M = 5.02$, $SD = .68$) compared to baseline ($M = 4.80$, $SD = .76$), $t(61) = -2.82$, $p < .01$. There were, however, no significant differences between baseline and follow-up in the frequency of the specific types of everyday memory lapses self-reported on the retrospective questionnaire when using a more conservative significance value of $p < .001$ (Table 6).

Seriousness ratings

Paired samples t -tests showed that there were no differences in the rated seriousness of everyday memory lapses at baseline ($M = 4.91$, $SD = 1.13$) compared to follow-up ($M = 4.86$, $SD = 1.28$), $t(60) = .36$, $p = .72$, $d = .04$. At follow-up, the older adults endorsed forgetting words (4.42) and names (4.44) as the most serious of the everyday memory lapses, followed by losing thread of thought in conversation (4.56), feeling unsure if told someone something (4.58), and forgetting appointments (4.60).

Compensatory strategy use

Paired samples t -tests showed that there were no significant differences in strategy use at follow-up ($M = 22.46$, $SD = 7.32$), $t(60) = 1.08$, $p = .29$, compared to baseline ($M = 23.34$, $SD = 7.80$). There were also no significant differences for any of the specific compensatory strategies, t 's < 1.65 (Table 7). Grocery lists and appointment books continued to be used most heavily.

Correlations with objective memory

When using the daily diary measure, the older adults who tended to endorse fewer everyday memory lapses at follow-up also performed better on the MAS administered at baseline, $r = -.27$, $p < .05$, and at follow-up, $r = -.36$, $p < .005$. In contrast and similar to Experiment 1, older adults' performances on the MAS administered at baseline, $r = .03$, $p = .85$, and follow-up, $r = .14$, $p = .28$, were not significantly associated with everyday memory lapses when measured by the retrospective questionnaire at follow-up. There was also a significant relationship between the retrospective questionnaire and daily diary responses, $r = -.37$, $p < .01$, at follow-up.

Discussion

Although older adults reported fewer everyday memory lapses at follow-up compared to baseline on the retrospective questionnaire, they reported experiencing more frequent

everyday memory lapses on the daily diary measure. Specifically, in comparison to baseline, they reported experiencing even more days in which they forgot names and words at follow-up. Considering that the daily diary also correlated more strongly with laboratory memory performance compared to the retrospective questionnaire, taken together these findings suggest that daily diary methods may be a better method for more accurately evaluating everyday memory lapses. In contrast to baseline data, follow up data showed that older adults were reporting the significance of forgetting words, names, and appointments as number 1, 2, and 5, respectively, compared to numbers 3, 2, and 1. Despite endorsing more frequent everyday memory lapses on the daily diary at follow-up, older adults did not report an increase in compensatory strategy use.

General Discussion

It is often believed that older adults experience frequent everyday memory lapses. Although prior studies have typically examined the total frequency of everyday memory lapses experienced by older adults, there has been relatively little study of specific everyday memory lapses, or whether the frequency and significance of everyday memory lapses change or have relationships to laboratory memory performance over time. We used a unique approach to examine the specific types of everyday memory lapses that older and younger adults reported experiencing in their everyday lives with both a retrospective questionnaire and daily diary.

While the comparative data on everyday memory lapses of younger and older adults is mixed (e.g., Whitbourne, 2008), we found that older adults reported a higher frequency of total everyday memory lapses on the retrospective questionnaire yet endorsed a similar number of everyday memory lapses as younger adults on the daily diary. In addition to total frequency, we also examined group differences in the frequency of specific everyday memory lapses. Although the younger adults did not report experiencing more of any one specific everyday memory lapse on the retrospective questionnaire, compared to the older adults, on the daily diary they indicated experiencing significantly more days in which they forgot appointments and personal dates. Compared to younger adults, the older adults endorsed experiencing more days in which they forgot names and words on the daily diary, and similar difficulties with remembering names, faces, and phone numbers on the retrospective questionnaire. These findings are consistent with clinical and research data indicating that difficulties with remembering names and words are commonly reported by older adults (e.g., Craik, Swanson, & Byrd, 1987; Kausler, 1994; Schmitter-Edgecombe, Vesneski, & Jones, 2000). Our results further showed that, relative to younger adults, older adults reported using more compensatory strategies (e.g., daily planner, lists) to assist them with remembering everyday tasks. Consistent with prior work (e.g., Reese, Cherry, & Norris, 1999), older adults may have learned to compensate for the difficulties younger adults reported with remembering appointment and personal dates by using external compensatory aids such as appointment books. There are, however, fewer external techniques that can easily assist with the types of difficulties older adults were reporting (i.e., names, faces and words), and internal strategies may be difficult to apply and not always successful.

When we examined changes over time in the types and frequencies of everyday memory lapses in older adults, we found that, while the older adults reported fewer everyday memory lapses at follow up compared to baseline on the retrospective questionnaire, they endorsed experiencing more total everyday memory lapses on the daily diary. On the daily diary, the older adults indicated experiencing more days in which they forgot names and words at follow-up. As forgetting names and words were also the most commonly reported everyday memory lapse for the older adults at baseline on the daily diary, older adults may be experiencing an increase in the frequency of these types of everyday memory lapses with increasing age. This pattern of difficulties with names and words could represent errors typical of healthy aging. Despite experiencing more everyday memory lapses as reported on the daily diary, we did not find that older adults were using more compensatory strategies at follow-up compared to baseline. However, this data was derived from a retrospective memory questionnaire and it may have been different if a daily checklist for compensatory strategy use had been used. Nevertheless, this highlights an important area of opportunity for intervention with older adults as use of compensatory strategies is likely to reduce both the frequency and seriousness of everyday memory lapses.

We also examined the significance or seriousness of each everyday memory lapse to improve understanding of the specific everyday memory lapses older adults consider most distressing. Our findings are generally consistent with Cavanaugh et al. (1983) as we found a trend for the older adults to be more concerned about memory failures than younger adults. Furthermore, although forgetting words and names were the most frequent everyday memory lapses for older adults, we found that they rated forgetting appointments as the most distressing error at baseline. This suggests that everyday memory lapses that occur most frequently for older adults may not necessarily be the most concerning. These findings underscore the importance for future research and clinical work to consider both the frequency and significance of older adults' memory complaints. Targeting the everyday memory lapses that older adults experience frequently and consider significant will be important to guide the development of useful compensatory strategies and intervention at both a global and individual level that will have a practical impact.

While both younger and older adults reported forgetting appointments as the most distressing everyday memory lapse, the older adults ranked forgetting names and words as 2nd and 3rd, respectively, and the younger adults ranked them as 12th and 10th, respectively. For the OAs, with the exception of forgetting appointments, the seriousness rankings of forgetting words and names were generally similar to their frequency ratings. By attributing more significance to these specific everyday memory lapses, the older adults may have increased the salience of their frequency of occurrence. However, the younger adults also endorsed a high frequency of forgetting names and words, but unlike the older adults, they did not consider these specific everyday memory lapses to be significant. We also did not find a significant increase in older adults' perception of the seriousness of everyday memory lapses from baseline to follow-up. While this may be a typical finding for cognitively healthy older adults, a different pattern is likely to emerge with individuals who begin to experience cognitive impairment.

For younger adults, we did not find a relationship between objective memory performance and everyday memory lapses as assessed by either the retrospective questionnaire or daily diary. Unlike other studies that found an association between the MFQ Frequency of Forgetting subscale and objective memory performance (e.g., Parisi, 2011; Lane & Zelinski, 2003) for older adults, the retrospective questionnaire did not correlate with objective memory performance at either baseline or follow-up. In contrast, the daily diary correlated with objective memory performance at both baseline and follow-up, suggesting that older adults with better objective memory performance were reporting fewer everyday memory lapses. Prior research has been mixed on the relationship between objective performance and subjective reports of cognition when measured concurrently (e.g., Jungwirth et al., 2004; Van Bergen, Jelicic, & Merckelbach, 2009). However, our findings suggest that self-report of frequency of everyday memory lapses are associated with both concomitant and longitudinal changes in objective memory performance when measured by daily diaries. Our findings are also consistent with other studies showing associations between daily diaries of everyday memory lapses and objective memory performance (e.g., Rickenbach et al., 2014).

These findings support the idea that the retrospective questionnaire and daily diary are not capturing exactly the same information despite correlating at both baseline and follow-up. The daily diary method may be a more accurate representation of everyday memory abilities and lapses. The daily diary methodology required participants to note memory failures within the day that they occurred, thereby reducing the time interval between incidence and report of the everyday memory lapse and increasing the reliability. Thus, daily diaries may be an ecologically valid method for better-capturing objective information about everyday memory lapses in healthy older adults. It will be important to assess the feasibility and reliability of this method with individuals with cognitive impairment. Recently emerging opportunities for conducting ecological momentary assessment with cell phones and wearable technologies may make it even easier to capture detailed information about the frequency and types of everyday memory lapses that occur in the real-world environment.

Regarding limitations, our older adult participants were cognitively healthy, highly educated, primarily Caucasian, and may not be representative of the general population or of older adults whose memory problems are disruptive to everyday life. In addition, there was dropout in the number of participants who completed follow-up assessment. Although there were minimal differences between follow-up responders and nonresponders, it is possible that individuals who did not return may have experienced declines in cognition. Furthermore, there may have been a bias in self-reported memory problems. It is also likely that the frequency of everyday memory lapses reported via the daily diary is an underestimation as participants could have forgotten to report memory failures. Moreover, although our follow-up interval was five years, it would be interesting to investigate the relationship between everyday memory lapses and laboratory memory measures over a longer time period. It would also be of interest to examine in those with a broader range of subjectively perceived memory problems.

Both cross-sectionally and longitudinally, the present study characterized the everyday memory lapses experienced by older adults, and compared them with laboratory memory

performance. We found that older adults endorsed forgetting names and words on a greater number of days than younger adults, and they ranked these memory lapses as among the most serious memory lapses. As the older adults aged, they reported experiencing more days in which they forgot names and words. The older adults appeared to be using external compensatory strategies (e.g., appointment books, lists) to help prevent the types of memory lapses that the younger adults reported experiencing more often (i.e., appointments, personal dates). When developing interventions, it is important to target those memory lapses that older adults are especially concerned with and that they report as occurring more frequently. Furthermore, the older adults who endorsed experiencing a greater number of memory lapses also performed more poorly on the laboratory memory measure. A daily diary checklist or newer technologies that allow for periodic daily responses may be a viable way to assess the types of memory lapses that healthy older adults experience in their everyday lives.

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Table 1

Mean Number of Days Endorsed on the Daily Diary by Both Older and Younger Adult Groups

Type of Everyday Memory Lapses	Older adults N = 138				Younger adults N = 138				r	
	M	Mdn	SD	IQR	M	Mdn	SD	IQR		U
1. Names	2.70*	2.00	1.98	3.00	1.74 ^a	2.00	1.42	3.00	6942.00	.24
2. Words	2.50*	2.00	2.28	4.00	1.36 ^a	1.00	1.54	2.00	6887.50	.25
3. Faces	.37	.00	.75	.00	.49 [‡]	.00	1.06	.25	9379.00	.02
4. Appointments	.10	.00	.37	.00	.36 ^{‡*}	.00	.66	1.00	7749.00	.24
5. Personal Dates	.09	.00	.36	.00	.40 ^{‡*}	.00	.71	1.00	7475.00	.28
6. Correspondences	.45	.00	1.11	.00	.36	.00	.66	1.00	9201.00	.04
7. Directions	.18	.00	.44	.00	.45 [‡]	.00	.83	1.00	8247.50	.16
8. Where put something	1.56	1.00	1.84	2.00	1.93 [‡]	1.00	1.90	3.00	8291.00	.12
9. Phone number just checked	.77	.00	1.35	1.00	.77	.00	1.05	1.00	8790.50	.07
10. Phone number used frequently	.35	.00	.84	.00	.33	.00	.67	1.00	9272.50	.03
11. Thread of thought in conversation	.85	.00	1.48	1.00	1.30 [‡]	1.00	1.68	2.00	7966.50	.15
12. Something someone told you	.99	.00	1.43	1.25	1.41 [‡]	1.00	1.46	2.00	7741.50	.17
13. Unsure if told someone something	.88	.00	1.34	1.25	1.25 [‡]	1.00	1.44	2.00	7802.00	.17
14. What you were doing	1.33	1.00	1.70	2.00	1.00	.00	1.48	1.00	8610.50	.09
15. What wanted to buy at store	.29	.00	.63	.00	.34 [‡]	.00	.62	1.00	9043.50	.06
16. How to perform a household chore	.10	.00	.41	.00	.09	.00	.37	.00	9450.00	.01
Total everyday memory lapses	1.93	1.64	1.33	1.89	1.94	1.71	1.32	1.89	9438.50	.01

Note.

U = Mann-Whitney U test. r = effect size (Z/ N).

^aOAs endorsed everyday memory lapse as occurring on a greater number of days than YAs.

[‡]YAs endorsed everyday memory lapse as occurring on a greater number of days than OAs.

* p < .001.

Table 2

Mean Frequency of Forgetting Endorsed on the Retrospective Questionnaire by Both Older and Younger Adult Groups

Type of Everyday Memory Lapses [†]	Group				<i>t</i> -test	Cohen's <i>d</i>
	Older adults <i>N</i> = 138		Younger adults <i>N</i> = 138			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
1. Names	3.47**	1.12	4.14	1.64	2.99	.48
2. Words	4.36	1.43	4.93	1.90	2.79	.34
3. Faces	4.71**	1.36	5.63	1.53	5.29	.64
4. Appointments	5.22	1.43	5.52	1.53	1.70	.20
5. Personal Dates	5.10	1.34	4.90	1.68	-1.11	.13
6. Correspondences	4.79	1.61	4.79	1.67	.00	.00
7. Directions	5.09	1.46	5.12	1.73	.19	.02
8. Where put something	4.43	1.49	4.67	1.52	1.32	.16
9. Phone number just checked	4.49	1.53	5.07	1.65	3.02	.36
10. Phone number used frequently	5.32**	1.36	6.15	1.67	4.54	.55
11. Thread of thought in conversation	5.04	1.21	5.14	1.62	.55	.07
12. Something someone told you	4.95	1.24	5.28	1.57	1.91	.23
13. Unsure if told someone something	4.57	1.25	4.92	1.52	2.12	.25
14. What you were doing	4.96	1.50	5.04	1.56	.39	.05
15. What wanted to buy at store	5.12	1.23	5.20	1.57	.43	.06
16. How to perform a household chore	5.61	1.22	5.58	1.66	-.17	.02
Total Retrospective Questionnaire	4.83*	.79	5.13	1.16	2.52	.30

Note.

[†]Higher scores indicate better perceived memory functioning.

* $p < .05$.

** $p < .001$.

Table 3

Mean Compensatory Strategy Use for the Older and Younger Adult Groups

Compensatory Strategy [†]	Older adults <i>N</i> = 138		Younger adults <i>N</i> = 138		<i>t</i> -test	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Total aid use	23.62	8.43	26.46	11.13	2.39 *	.29
Appointment book	2.38	1.58	3.19	2.23	3.46**	.42
Reminder notes	2.75	1.44	2.96	1.88	1.04	.13
To-do lists	2.62	1.44	2.98	1.88	1.80	.21
Grocery lists	2.08	1.34	3.61	2.17	7.04**	.85
Plan daily schedule	3.28	1.49	3.58	2.01	1.40	.17
Mental repetition	3.81	1.47	3.45	1.87	-1.79	.21
Associations	3.90	1.57	3.90	1.96	.00	.00
Prominent place	2.80	1.29	2.80	1.76	.00	.00

Note.

[†] Higher scores indicate less compensatory strategy use.* $p < .05$. ** $p < .001$.

Table 4

Demographics and Mean Summary Data for Returner and Non-Returner Older Adult Groups

Variable or test	Older adult groups				<i>t</i> -test	Cohen's <i>d</i>
	Returners <i>N</i> = 62		Non-returners <i>N</i> = 76			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Age	68.28	6.55	72.19 ^{<i>d</i>}	7.65	3.18 [*]	.55
Gender	38F, 24M		49F, 27M			
Education	17.06	2.52	17.08	2.59	.03	.01
Estimated FSIQ ^{<i>a</i>}	119.98	12.29	116.51 ^{<i>c</i>}	10.74	-1.76	.30
Retrospective Questionnaire ^{<i>f</i>}	4.81	.76	4.85	.82	.34	.05
Daily Diary	1.89	1.29	1.96	1.37	.32	.05
MAS Global Memory ^{<i>b</i>}	100.08 ^{<i>d</i>}	11.99	100.73 ^{<i>e</i>}	14.53	.27	.05

Note. FSIQ = Full Scale Intelligence Quotient. MAS = Memory Assessment Scale.

^{*f*} Higher scores indicate better perceived memory functioning.

^{*a*} Estimated FSIQ derived from the Vocabulary, Block Design, Arithmetic, and Similarities subtests of the WAIS-R.

^{*b*} Age and education corrected scaled score.

^{*c*} *n* = 74.

^{*d*} *n* = 60.

^{*e*} *n* = 73.

^{*} *p* < .01.

Number of Days on the Daily Diary in which Everyday Memory Lapses were Endorsed by Older Adults Returning at Follow-Up

Table 5

Type of Everyday Memory Lapses	Older adult returners N = 62										
	Time 1					Time 2					r
	M	Mdn	SD	IQR	M	Mdn	SD	IQR	Z		
1. Names	2.66	2.50	1.91	3.00	3.47 ^a	3.00	2.27	3.00	-2.74 ^{**}	.35	
2. Words	2.40	2.00	2.22	4.00	3.26 ^a	3.00	2.41	4.25	-2.71 ^{**}	.34	
3. Faces	.29	.00	.66	.00	.27	.00	.61	.00	-.07	.01	
4. Appointments	.15	.00	.47	.00	.16 ^a	.00	.45	.00	-.37	.05	
5. Personal Dates	.11	.00	.45	.00	.25 ^a	.00	.49	.00	-1.38	.18	
6. Correspondences	.42	.00	1.05	.00	.40	.00	1.09	.00	-.24	.03	
7. Directions	.23	.00	.53	.00	.13	.00	.34	.00	-1.09	.14	
8. Where put something	1.61	1.00	2.03	3.00	1.63 ^a	1.00	1.57	3.00	-.31	.04	
9. Phone number just checked	.63	.00	1.30	1.00	.87 ^a	.00	1.41	2.00	-1.38	.18	
10. Phone number used frequently	.31	.00	.99	.00	.61 ^a	.00	1.50	1.00	-1.98 [*]	.25	
11. Thread of thought in conversation	.84	.00	1.48	1.00	.79	.00	1.26	1.00	-.32	.04	
12. Something someone told you	.89	.00	1.28	1.00	1.06 ^a	.00	1.65	2.00	-.67	.09	
13. Unsure if told someone something	1.03	.00	1.43	2.00	1.06 ^a	.00	1.60	2.00	-.01	.00	
14. What you were doing	1.32	1.00	1.69	2.00	1.31	1.00	1.84	2.00	-.10	.01	
15. What wanted to buy at store	.31	.00	.62	.25	.31	.00	.64	.00	-.16	.02	
16. How to perform a household chore	.03	.00	.18	.00	.05 ^a	.00	.22	.00	-.45	.06	
Total everyday memory lapses	1.89	1.50	1.29	1.64	2.23	2.07	1.44	1.86	-1.97 [*]	.25	

Note.

Z = Wilcoxon Signed-Rank test. r = effect size (Z/ N).

^aOAs endorsed everyday memory lapse as occurring more often at Time 2 than Time 1.

^{**} p < .01.

^{*} p < .05.

Table 6

Mean Frequency of Forgetting Endorsed by Older Adults at Baseline and Follow-Up

Type of Everyday Memory Lapses [†]	Older Adult Group <i>N</i> = 61				<i>t</i> -test	Cohen's <i>d</i>
	Baseline		Follow-Up			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
1. Names	3.33	1.01	3.51	.89	1.53	.19
2. Words	4.36	1.51	4.59	1.28	1.07	.16
3. Faces	4.64	1.40	4.75	1.11	.75	.09
4. Appointments	5.22	1.29	5.42	1.15	1.35	.16
5. Personal Dates	5.19	1.22	5.37	1.22	1.12	.15
6. Correspondences	4.85	1.54	5.25	1.23	2.19	.29
7. Directions	5.18	1.46	5.36	1.05	1.23	.14
8. Where put something	4.44	1.36	4.84	1.05	2.22	.33
9. Phone number just checked	4.37	1.54	4.68	1.20	1.89	.22
10. Phone number used frequently	5.27	1.53	5.23	1.24	-.17	.03
11. Thread of thought in conversation	5.20	1.98	5.30	1.06	.41	.06
12. Something someone told you	4.77	1.18	5.11	1.02	2.20	.31
13. Unsure if told someone something	4.52	1.25	4.57	1.13	.32	.04
14. What you were doing	5.07	1.48	5.22	1.12	.96	.11
15. What wanted to buy at store	5.12	1.12	5.38	.96	1.73	.25
16. How to perform a household chore	5.56	1.30	5.82	1.12	1.54	.21
Total Retrospective Questionnaire	4.80	.76	5.02	.68	-2.82*	.31

Note.

[†]Higher scores indicate better perceived memory functioning.**p* < .01.

Table 7

Mean Compensatory Strategy Use for Older Adults at Follow-up

Compensatory Strategy [†]	Older Adult Group <i>N</i> = 61				<i>t</i> -test	Cohen's <i>d</i>
	Time 1		Time 2			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Total aid use	23.34	7.80	22.46	7.32	1.08	.12
Appointment book	2.30	1.53	2.03	1.45	1.45	.18
Reminder notes	2.66	1.45	2.41	1.19	1.65	.19
To-do lists	2.50	1.33	2.48	1.27	.12	.02
Grocery lists	1.98	1.30	2.05	1.27	-.49	.05
Plan daily schedule	3.30	1.41	3.16	1.45	.82	.10
Mental repetition	3.87	1.48	3.89	1.62	-.08	.01
Associations	3.90	1.61	3.84	1.42	.33	.04
Prominent place	2.82	1.25	2.56	1.12	1.46	.22

Note.

[†]Higher scores indicate less compensatory strategy use.

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