Everyday Memory Errors and the Use of Memory Strategies in Young and Older Adults: A Diary Study

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Introduction

- Negative age effects, consistently obtained in laboratory research on memory, imply that older adults also experience more everyday memory errors than younger adults.
- However, research on prospective memory (PM) and ageing has cast some doubts on this assumption and calls for more targeted investigation of everyday memory errors outside laboratory (see Henry et al., 2004)
- Few recent diary studies confirmed positive age effect on PM errors and suggested, that perhaps older adults use more strategies which help them to avoid committing PM errors (Hass et al., 2020; Niedzwienska et al., 2020)
- No previous diary study has investigated the use of memory strategies in everyday life and compared it in young and older adults.

Aims

- To compare the nature and frequency of everyday memory errors in young and older adults.
- To compare the use of memory strategies in everyday life of young and older adults.

Method

Participants

- **35** young adults (YA, 25 women), recruited from the University of Hertfordshire. Mean age 22.26 (SD = 4.01, Range 18 – 35).
- **34** older adults (OA, 31 women), recruited from the University of 3rd Age and a pool of volunteers at the University of Hertfordshire. Mean age 74.29 (SD = 7.01, Range 63 – 89).
- All participants were screened using Montreal Cognitive Assessment (MOCA) for underlying cognitive impairment.

Table 1. *Background characteristics of young and older adults (Means, SD)*

	YA (n = 35)	OA (n = 34)	F	p	η^2
Education in years	14.49 (1.84)	15.05 (2.72)	1.06	.31	.02
MOCA	28.37 (1.14)	28.15 (1.46)	.87	.48	.01
Logical Memory	20.29 (3.03)	18.53 (3.41)	5.12	.03	.07
Rey Complex Figure	25.61 (6.05)	18.74 (6.80)	19.72	<.001	.23
Paired Associates	7.74 (.51)	7.15 (1.28)	6.52	.01	.09
Mill Hill Vocabulary Test	15.34 (4.01)	23.97 (3.48)	90.65	<.001	.58

Materials (Figure 1)

- **A diary of everyday memory errors** – A 32 page A5 paper diary booklet for recording everyday memory errors as soon as they happen.
- **A diary of memory strategy use** – A 32 page A5 paper diary booklet for recording memory strategies as soon as they are used.
- **A WatchMinder –** a water proof wristwatch for participants to wear during the 3-day diary recording to act as a reminder (vibrates few times a day) to keep a diary.

Procedure

- **Stage 1:** Participants completed a series of background measures (see Table 1), and were given **the diary of everyday memory errors** and **a watch** to keep over the next 3 days.
- **Stage 2 :** The diary of memory errors was collected, and participants were given a **diary of memory strategies** to keep over the next 3 days.
- **Stage 3:** The diary of memory strategy use and the watch were collected.

## Results

Diary compliance

No significant age effects were found in terms of:
- how many participants kept the diary of everyday memory errors with them for all 3 days, χ^2 (1, N = 69) = .00, p = .98.
- how many participants kept the diary of strategy use with them for all 3 days, χ^2 (1, N = 68) = 1.94, p = .16.

Diary of everyday memory errors

A total of **465** memory errors were recorded. Young adults recorded **245** errors (M = 5.77, SD = 4.40, Range 1 - 19) and **220** errors were recorded by older adults (M = 4.95, SD = 3.65, Range 1 - 19). There were no significant group differences in the total number of memory errors (**p = .70**).
- Memory errors were coded by 3 raters as **prospective (PM), retrospective (RM)** and **absent-minded (AM).** The agreement between raters was 89%.
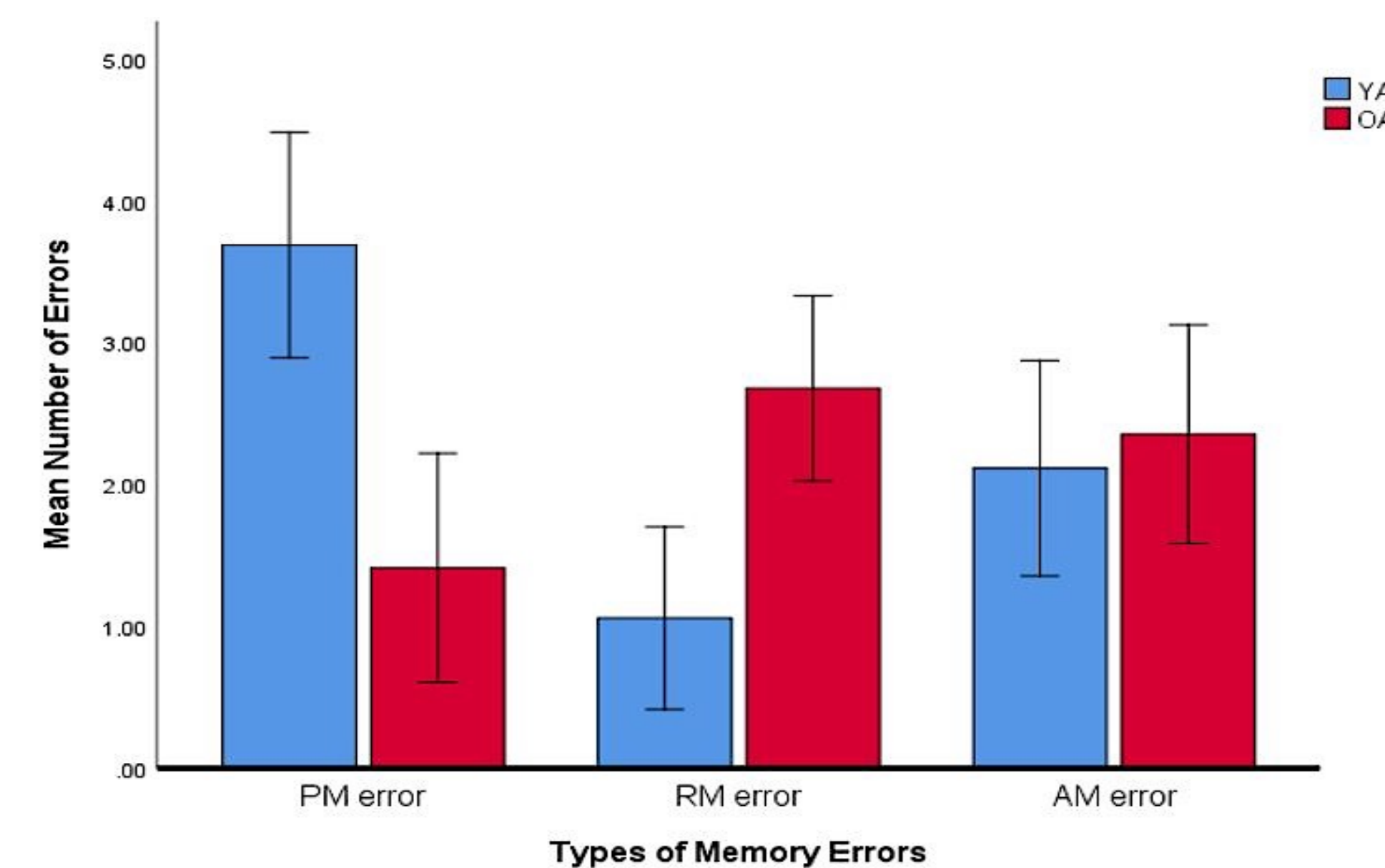
- Main effect of age: NS (p = .94)
- Main effect of Memory Error type: NS (p = .06)
- **Age by Memory error type interaction effect:** $F(2, 134) = 19.37$, $p < .001$, $\eta_p^2 = .22$
  - **PM** errors: YA > OA; $F(1, 67) = 19.56$, $p < .001$, $\eta_p^2 = .22$
  - **RM** errors: YA < OA; $F(1, 67) = 14.43$, $p < .001$, $\eta_p^2 = .18$
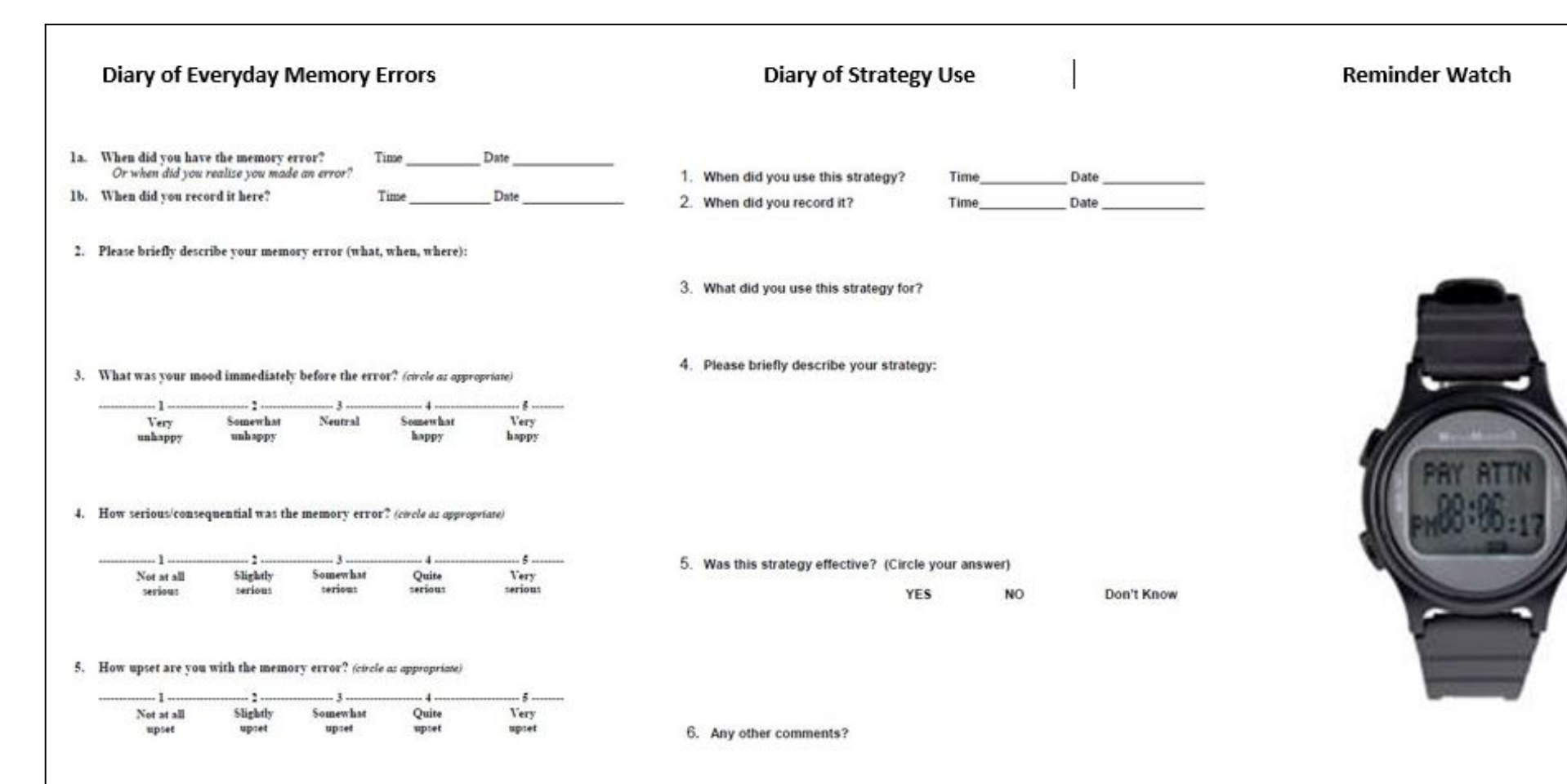 - **AM** errors: YA = OA; $F < 1$

Figure 1. *Example pages of diaries for memory errors, memory strategies, and a reminder watch*

Diary of memory strategy use

In total **514** memory strategies were recorded. Of these, **236** strategies were recorded by young adults (M = 6.74, SD = 5.76, Range 1-31) and **278** strategies recorded by older adults (M = 8.42, SD = 7.72, Range 0 – 38). There were no significant group differences in the total number of strategies recorded (**F < 1**).
- Memory strategies were coded by 2 raters as **PM - , RM - ,** and **AM – related**. The agreement between raters was 90%.
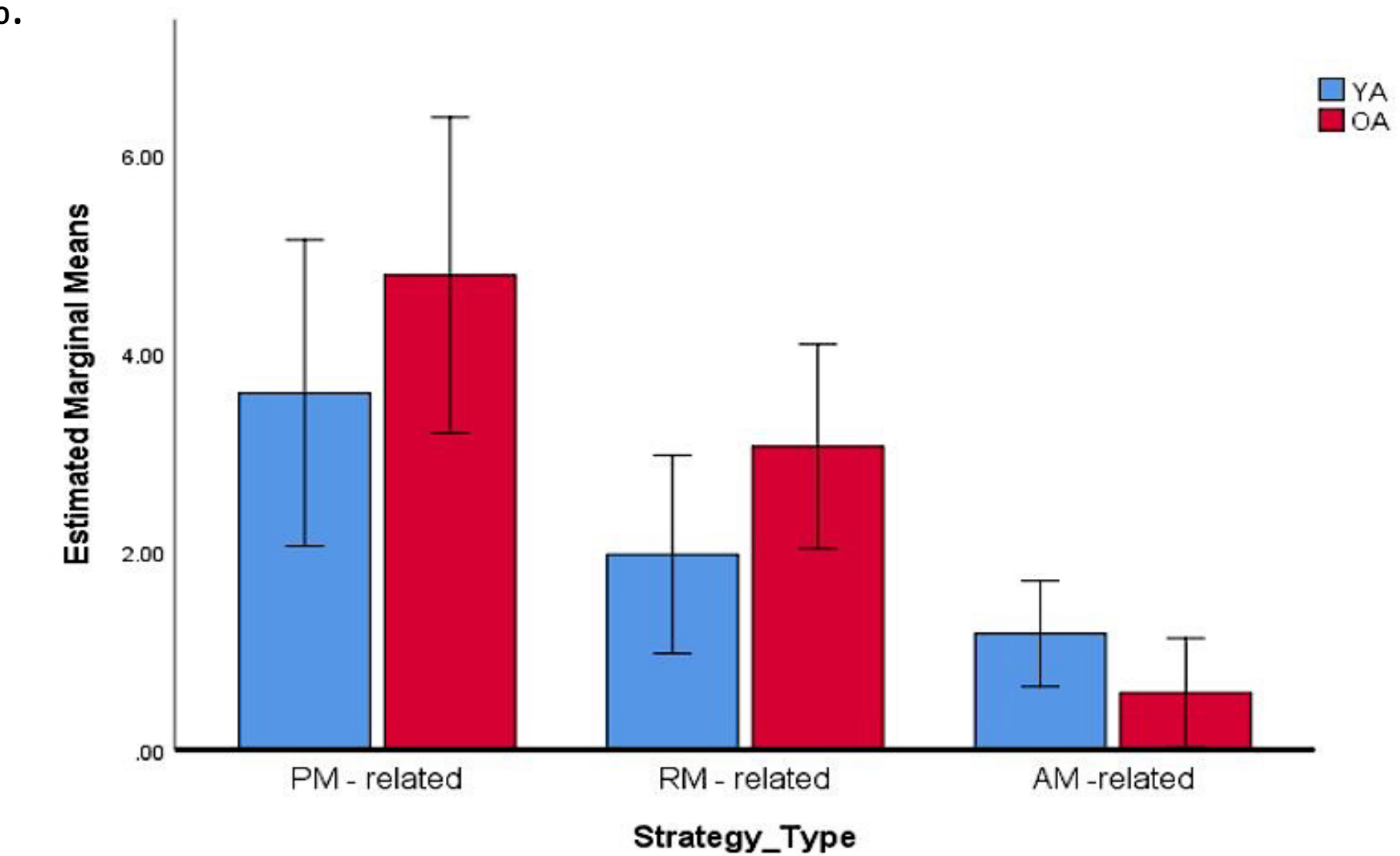
- Main effect of age: NS (p = .86)
- **Main effect of strategy type:** $F(1.812, 119.602) = 36.37$, $p < .001$, $\eta_p^2 = .35$
- **Age by Strategy type interaction effect:** $F(1.812, 119.602) = 3.25$, $p = .047$, $\eta_p^2 = .05$.
  - **PM-related** strategies: YA = OA (p = .23)
  - **RM-related** strategies: YA = OA (F < 1)
  - **AM-related** strategies: YA > OA; $F(1, 66) = 4.67$, $p = .03$, $\eta_p^2 = .07$

Conclusions

- In line with initial findings by Laughland (2017), young and older participants did not differ in the total number of recorded memory errors. However, while young adults reported significantly more PM errors, older adults reported significantly higher number of RM errors, but no group differences found in the frequency of reported AM errors. Moreover, **the differences in recorded PM and RM errors could not be explained by the use of memory strategies**.
- While the results of an **age-related benefit in everyday PM** replicate findings of previous diary studies, negative age effects on RM in everyday life was not been reported (Haas et al., 2020; Niedzwienska et al., 2020). As such, this is a novel finding, which shows that **RM impairment in older adults**, observed in laboratory studies, does potentially **generalize to everyday life**.
- Contrary to the findings of Cavanaugh et al., (1983), no age differences in the total number of recorded memory strategies were obtained. This is an important finding indicating that **the use of strategies does not change substantially with increasing age**.
- **Importantly**, the lack of age effect in the overall number or errors and strategies recorded was not due to a difference in the diary compliance rates as both, young and older were equally compliant.
- Taken together, these results have important **implications for research on everyday memory and ageing** by replicating age benefit in everyday PM, and by demonstrating that this benefit cannot be explained by the use of PM-related strategies.

References

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