

Self-reported social and motivational factors in health-related future intentions amongst older adults

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Abstract

Prospective memory (PM), the ability to form a specific intention and remember to carry it out at an appropriate future time, is critical in health-related contexts and has been found to decline significantly with age. Further, motivation plays a vital role in PM and previous research indicated that older adults are particularly motivated by the social relevance of PM tasks. However, little is known about the role of perceived social impact in older adults' health intentions. The current study aimed to explore the motivation behind carrying out future intentions. Participants ($n=116$, $M_{\text{age}} = 70.78$) self-rated their motivation for health-related tasks with either a social (remind your partner to take medications) or non-social (remember to take your own medications) aspect. Quantitative results indicated that some aspects of motivation (impact on others, effort, and enjoyment) were enhanced by social context, while others (personal reward and relatedness) were not. We also gathered qualitative information on health-related PM tasks in their daily lives and links to social motivation. Most participants reported helping someone else to remember their health-related PM tasks and experiencing positive emotions as a result of helping others. The findings may have implications for motivating people to remember health tasks, which could aid independent living and quality of life for older adults.

Keywords Ageing · Prospective memory · Motivation · Social support · Healthy ageing

Introduction

Prospective memory (PM) is the ability to form a specific intention and remember to carry it out at the appropriate point, for example posting a letter on the way to the grocery store (Einstein and McDaniel 1996). PM is a vital part of many health-related tasks, for example remembering to take medications (Zogg et al. 2012), monitoring blood pressure (Brom et al. 2014), attending health appointments (Fink et al. 2014), and engaging in physical activity (Wolff et al. 2016). Maintenance of effective PM is particularly important for older adults as they have a higher number of health-related tasks to carry out in daily life relative to other age groups (Park et al. 1994). Better PM ability is also related to independent living and better quality of life in older age (Hering et al. 2018). However, little is known about factors that may motivate older adults to engage in health-related PM tasks. The present

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study explores whether using a social context in health-related tasks would increase older adults' motivation to carry out the intended tasks. In other words, here, we focus on understanding motivation to carry out prospective tasks rather than enactment of the behaviour itself.

Previous research investigated how older adults' health-related PM tasks can be best supported, with many studies focusing on medication adherence. Patients are nonadherent to their medications 50% of the time (Brown et al. 2016), and nonadherence may be intentional or nonintentional (Molloy et al. 2014), making it of particular interest to researchers. Insel et al. (2013; 2016) developed a multifaceted PM intervention for older adults which aimed to shift dependence on working memory and executive functions, which tend to decline with age, to other cognitive processes that are spared in ageing, i.e. automatic associative processes such as using cues (e.g. taking a pill when brushing teeth in the evening). Participants in the cognitive intervention condition significantly improved medication adherence compared to a control condition, and the effects were found to be greater for participants with poorer working memory and executive functions abilities. However, there was no sustained effect of the intervention on medication adherence at five-month follow-up, which might suggest older adults were either unmotivated or unable to continue following the strategies after the study ended. This indicates that there are issues around the continued use of supportive memory strategies in everyday life, which may be related to motivation.

Motivation is a key predictor of PM performance: deciding that an intended action is important enhances the chance of carrying it out. It is usually divided into two categories: intrinsic motivation (i.e. engaging in an activity because it gives inherent satisfaction) and extrinsic motivation (i.e. engaging in an activity because it achieves an external outcome) (Ryan and Deci 2000). Relating this specifically to PM is the Motivational-Cognitive Model (Penningroth and Scott 2007), which proposes that motivation to perform PM tasks increases when goals are viewed as personally important, i.e. the personal goal of maintaining good health might enhance the execution of the PM task of going for a walk tomorrow. Evidence suggests that perceived intention importance is indeed a predictor of PM performance (Rummel et al. 2023).

Grob et al. (2022) found that individual differences in motivation could explain a substantial part of PM performance in older adults. They argue that having high consistency of interest helped to maintain high intrinsic motivation, which in turn led to enhanced PM performance in a task which was relatively cognitively demanding (sending multiple text messages a day for 6 days). A study also found higher self-reported intrinsic motivation in older compared to younger adults during a PM task to contact the researchers at specific times (Kvavilashvili and Fisher 2007). However, less is known about how motivation relates to remembering health-related tasks in older adults.

A review by Peter and Kliegel (2018) highlighted that externally provided incentives (such as monetary rewards) might have less influence on older adults' PM performance as compared to participants' intrinsic interest (see also Horn and Freund 2021). An influential motivational theory of ageing is Socioemotional Selectivity Theory (SST, Carstensen 1991). The SST states that older adults perceive their time horizon as more limited which causes them to prioritise short-term emotional satisfaction and close relationships (Carstensen et al. 1999). Taken together, this suggests that social aspects of motivation may be particularly important for older adults' memory.

There is some evidence in younger adults that performance on PM tasks can be improved by manipulating participants' perception that doing well on the task was important for the experimenter (Guo et al. 2024; Zhou et al. 2025). Some ageing studies have also manipulated social motivation by asking participants to "do the researcher a favour" by remembering to perform a lab-based PM task. Altgassen et al. (2010) and Niedźwieńska and Barzykowski (2012) found that this social manipulation benefited older adults' PM compared to younger adults. El Haj et al. (2022) also report that increasing social motivation improved PM in healthy older adults, but not those who were cognitively impaired. Both healthy and cognitively impaired older adults reported that the social manipulation increased PM task motivation. Further, higher social support has been found to predict better PM performance bidirectionally in older adults (Keil et al. 2025).

Another approach to understanding the role of motivation in older adults' PM is through qualitative analyses of their experiences of PM errors and strategies, since we know that motivational factors are important for cognitive performance overall (Germain and Hess 2007). Diary studies have found social PM tasks were rated as more important than non-social tasks in younger and older adults (Schnitzspahn et al. 2016) and that these tasks were therefore prioritised over other PM tasks (Hass et al. 2020). Recent interview studies have identified that older adults themselves report socially relevant PM tasks as more motivating compared to non-socially relevant tasks (Nygaard et al. 2025). However, we know relatively little about how social motivation in older age might link specifically to remembering health-related tasks, and so in the current study we explore this link in more detail through both a social motivation manipulation and qualitative analysis of some open-ended questions about health PM tasks and links to social motivation.

Given the potential importance of social factors in older adults' motivation for carrying out PM intentions, we manipulated social context of health-related scenarios (e.g. remembering to pick up your own prescription vs reminding your partner to pick up their prescription) and investigated how social context impacted self-reported motivation to carry out the intention. We focused on understanding motivational factors because much less is known about these compared to performance on PM tasks. We predicted that older adult participants would self-report higher motivation for social compared to non-social health-related PM scenarios. Further, we had four exploratory questions. First, does age (within an older adult sample) affect motivation in social and non-social health-related scenarios? Second, is trait social motivation (i.e. how social interactions motivate one across a range of different contexts) related to motivation towards health, and does this relationship differ between social and non-social health-related scenarios? Third, do social contexts impact different aspects of motivation such as personal reward, intrinsic enjoyment and effort, impact on others and relevance to everyday experience? Finally, using content analysis of open-ended questions, we explored older adults' experiences of links between social motivation and health-related PM.

Method

Transparency and openness

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study, and we follow journal article reporting standards for quantitative research in psychology (Appelbaum et al. 2018). This study's design and its analysis were preregistered, and the preregistration can be accessed at [<https://osf.io/nw4ek>]. The study was approved by the Psychology Ethics Committee at the University of Aberdeen (748,484).

Sensitivity analysis

We initially ran the study as outlined below (without the open-ended questions) in 40 participants. A sensitivity analysis conducted on the data at that time indicated that to address the primary research question for the within-subjects factor of health-related scenario type (social/non-social), a sample of 120 participants would be sufficient to detect a small effect of Cohen's $d = 0.298$ with 90% power ($\alpha = 0.05$; note that this analysis assumes a non-significant effect of age). At this stage, we preregistered the study, with the addition of new open-ended questions that were not presented to the first 40 participants. All planned quantitative (with data including the first 40 participants) and qualitative analyses were preregistered.

Inclusion and exclusion criteria

Inclusion criterion was age of 60+. Exclusion criteria included any diagnosis of dementia or mild cognitive impairment (MCI) and medications which affect memory. We also planned to exclude data from participants with no variations in their responses (always pressing the same key). Four participants were subsequently excluded from the analysis due to self-report of a diagnosis of dementia or MCI.

Participants

The study included 116 participants (49 male, 66 females, one other) aged 60–87 ($M_{\text{age}} = 70.78$, $SD_{\text{age}} = 5.92$). Participants were recruited partly via the online platforms Prolific ($N = 61$) and Testable Minds ($N = 47$) and partly through the School of Psychology's participant panel, where a small portion of participants ($N = 12$) were invited to take part in-person at the University of Aberdeen's School of Psychology to be assisted with the computer and to provide feedback about the experiment. Participants received £6–10 reimbursement for participation depending on the platform. Participants were mainly from the UK ($n = 55$) or the US ($n = 43$), while the remaining 18 participants were from other countries (Portugal, Israel, Spain, Austria, Canada, Australia, New Zealand, Switzerland, Venezuela, South Africa).

All participants were relatively healthy as measured by self-report; 42 participants reported living alone and 23 had caring responsibilities.

Materials and procedure

The experiment was conducted online through Testable. After informed consent, participants filled out a sociodemographic questionnaire followed by a social motivation questionnaire (SMQ).

Sociodemographics

A sociodemographic questionnaire was administered with the following items: age, gender, occupation, number of years of education, highest level of education completed, current health status on a 5-point Likert scale (Very poor to Very good), current level of physical activity on a 5-point Likert scale (Very low to Very high), previous or current depression, medication which might affect memory, native language, caring responsibilities, and living situation (living alone; yes or no).

Social motivation questionnaire (SMQ)

The SMQ is a standardised questionnaire measuring general social motivation (Gong et al. 2019). It consists of eight items which are each rated on a 7-point Likert scale (from 1=strongly disagree to 7=strongly agree), e.g. "I spend most of my time with people whom I feel very close". Scores were averaged per participant.

Health-related scenarios with social context manipulation

Eight health-related situations requiring PM were created, each on a different themes, with two parallel versions (A and B) on each theme. The scenarios were created through iterative discussion amongst the authors based on familiarity with the relevant literature and examples of daily tasks and social factors reported by participants in a previous interview study (Nygaard et al. 2025). The themes/scenarios varied in terms of nature of the health task, and the nature of the social motivators to carry out the tasks. For each scenario, there was a social and non-social

Table 1 Example of two parallel versions of social and non-social scenarios questions (See full scenarios as Online Resource)

Exercise (scenario 1)	Version A	Version B
Social scenario	Imagine that after discussion with a family member you have both decided to exercise more to improve your physical fitness. Both of you will separately try to take at least a 30-min walk every day and keep in touch about your progress. Your task is to remember to take a walk every day.(1AS)	Imagine that you met up with a friend and you have agreed to make more of an effort to exercise to make you feel fitter this year. You are both going to use a step counter to try to aim for a walking target by 6pm each weekday. Your task is to remember to check your step counter by 6pm.(1BS)
Non-social scenario	Imagine that after reading about the benefits of exercise you have taken the decision that you would like to exercise more to improve your physical fitness. You are going to try to take at least a 30 min walk every day. Your task is to remember to take a walk every day.(1AN)	Imagine that you decided you would like to make more of an effort to exercise to make you feel fitter this year. You are going to use a step counter to try to aim for a walking target by 6pm each weekday. Your task is to remember to check your step counter by 6pm.(1BN)

Fig. 1 Example of social scenario presented with a motivation question below

Imagine that after discussion with a family member you have both decided to exercise more to improve your physical fitness. Both of you will separately try to take at least a 30 minute walk every day. Your task is to remember to take a walk every day.

This would be a task I think I would enjoy.



version, so in total 32 possible scenarios. The eight themes were: exercise, dental health, healthy eating, doctor appointments, medication, hospital, prescriptions and vitamins. Table 1 shows an example of the social and non-social scenarios in parallel versions A (walking) & B (step counter) for one of the themes (exercise). We created the parallel versions so that each participant would see social and non-social scenarios from within the same theme, but without having repetition of the other parts of the passage. Each participant saw only 1 of each parallel version (e.g. for scenario 1 titled “Exercise” one participant was presented with 1A social and 1B non-social, while another was presented with 1A non-social and 1B social). In total, each participant was presented with 16 health-related scenarios (eight social and eight non-social) in a randomised order.

After participants saw each scenario, they were asked five questions to address multiple aspects of motivation. Three were adapted from the Intrinsic Motivation Inventory (IMI, Ryan 1982) (enjoyment, effort, and reward), one item was included to measure social motivation by asking about the perceived impact on other people, and the final item was included to measure perceived relevance to everyday life (relatedness) (see Fig. 1):

- This would be a task I think I would enjoy (*enjoyment*)
- I would put a lot of effort into remembering this task because it is important (*effort*)
- I believe that how I complete this task could have an impact on other people (*impact*)
- I would do my best to complete this task because I think it would be personally rewarding (*reward*)
- This is a task I can imagine myself carrying out in my everyday life (*relatedness*).

Each question was rated on a 7-point Likert scale (from 1 = not at all true to 7 = very true).

The questions were presented in a randomised order across participants and scenarios. Each question was presented on screen below the scenario (see Fig. 1) until a response was made. Then, it was replaced with the

next question. The scenario information remained at the top of the screen until all five questions were answered. Participants then pressed a key to see the next scenario.

Open-ended questions

After participants had completed all the health scenarios, participants ($n = 72$) were asked some open-ended questions, three of which were of interest for the present study. (1) What health-related tasks do you regularly have to remember to carry out? This might include tasks like taking pills, attending medical appointments or taking exercise. (2) Do you find it easier to remember social commitments or health-related tasks? Why do think this is the case? (3) Is there anyone you help by reminding them of appointments, tasks or events? How does it make you feel to help?

Finally, participants were fully debriefed.

Analyses

Our preregistered plan [<https://osf.io/nw4ek>] was to test whether social context resulted in greater motivation and explore the effects of age, through a linear mixed model with the dependent variable of motivation (continuous), fixed effects of condition (social vs non-social, categorical) and age (continuous), their interaction, and random intercepts for participants and stimuli. We also planned to include an exploratory factor of general social motivation derived from the SMQ.

When constructing the motivation questions, we originally planned to average scores across the questions, (“Effort”, “Enjoyment”, “Impact”, “Relatedness” and “Reward”), assuming that they would have substantial shared variance. To assess this assumption, we ran a Confirmatory Factor Analysis (CFA) for the five items, evaluating overall model fit, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardised Root Mean Square Residual (SRMR). We used Hu and Bentler’s (1999) thresholds indicative of good model fit: CFI and TLI ≥ 0.95 , RMSEA ≤ 0.06 , and SRMR ≤ 0.08 . Failing to find support for a single factor solution, we removed the Impact, the item with the lowest loading to the single factor. The model fit improved but still failed to indicate support for a single factor solution with the remaining four items (the full analysis can be found as an Online Resource).

Therefore, we decided to examine each of the five items separately, running five linear mixed models that reflected our preregistered plan but with individual items rather than a single summary score. In other words, we ran linear mixed models with each motivation measure as a dependent variable, looking at fixed effects of condition (social versus non-social), and age, with random intercepts for participants and stimuli, and an exploratory factor of general social motivation (SMQ). Due to the increased number of tests, we controlled Type 1 error using false discovery rate correction (Benjamini and Hochberg 1995).

Qualitative content analysis was used to analyse responses to the open-ended questions ($n = 72$). Coding was carried out manually on Microsoft Excel. One primary coder (MN) analysed the data with help from two undergraduate students (YW and CL). Codes were then generated and categories were grouped based on similarity. Any differences between coders were resolved through discussion with the wider research team, to ensure consistency of coding.

Results

Impact of social context, age, and social motivation on motivation items

Separate linear mixed-effects models were conducted to look at the effect of social context on effort, enjoyment, impact, relatedness, and reward. With the inclusion of age, social motivation score, and interactions, we evaluated 25 tests in total. To control for Type 1 error, we computed a false discovery rate threshold (Benjamini and Hochberg 1995), which indicated that all p -values ≤ 0.022 were significant.

Table 2 reports the results of the analysis of the five separate questions “Effort”, “Enjoyment”, “Impact”, “Relatedness”, and “Reward”. Descriptive statistics for each motivational item by social context condition are included as an Online Resource. Social context effects varied across the different motivation questions. Relative to non-social condition, participants reported greater effort ($b = 0.20$, 95% CI [0.08, 0.31]), enjoyment ($b = 0.32$, 95% CI [0.10, 0.54]), and impact ($b = 2.04$, 95% CI [1.58, 2.50]) in the social condition. In contrast, reward ratings were lower in the social condition ($b = -0.32$, 95% CI [-0.50, -0.14]). Condition was not associated with relatedness ratings ($b = -0.01$, 95% CI [-0.17, 0.15]).

Age was positively associated with enjoyment ($b = 0.04$, 95% CI [0.01, 0.07]) and reward ($b = 0.04$, 95% CI [0.02, 0.07]) but was unrelated to effort ($b = 0.02$, 95% CI [0.00, 0.04]), impact ($b = 0.02$, 95% CI [-0.03, 0.06]), and relatedness ($b = 0.02$, 95% CI [-0.01, 0.05]). Across items, our exploratory factor of SMQ showed higher social motivation scores were consistently associated with higher ratings for effort, enjoyment, impact, relatedness,

Table 2 Results of the effects of social context condition, age, and SMQ scores on the five separate questions assessing motivation

	b	95% CI	SE	t	p
<i>Effort</i>					
Condition	0.20	[0.08, 0.31]	0.06	3.44	.002
Age	0.02	[0.00, 0.04]	0.01	1.75	.082
SMQ	0.35	[0.20, 0.50]	0.07	4.71	<.001
Condition:Age	0.00	[-0.01, 0.01]	0.01	-0.03	.977
Condition:SMQ	-0.06	[-0.15, 0.04]	0.05	-1.19	.234
<i>Enjoyment</i>					
Condition	0.32	[0.10, 0.54]	0.10	3.06	.008
Age	0.04	[0.01, 0.07]	0.02	2.33	.022
SMQ	0.30	[0.08, 0.52]	0.11	2.73	.007
Condition:Age	0.00	[-0.02, 0.01]	.009	-461	.646
Condition:SMQ	0.01	[-0.11, 0.13]	0.06	0.17	.866
<i>Impact</i>					
Condition	2.04	[1.58, 2.50]	0.22	9.11	<.001
Age	0.02	[-0.03, 0.06]	0.02	0.73	.465
SMQ	0.45	[0.18, 0.72]	0.14	3.29	.001
Condition:Age	-0.01	[-0.05, 0.03]	0.02	-0.42	.675
Condition:SMQ	-0.25	[-0.52, 0.01]	0.13	-1.90	.060
<i>Relatedness</i>					
Condition	-0.01	[-0.17, 0.15]	0.08	-0.13	.901
Age	0.02	[-0.01, 0.05]	0.01	1.48	.141
SMQ	0.32	[0.14, 0.50]	0.09	3.48	.001
Condition:Age	-0.01	[-0.03, 0.01]	0.01	-1.18	.239
Condition:SMQ	0.00	[-0.13, 0.13]	0.07	-0.07	.947
<i>Reward</i>					
Condition	-0.32	[-0.50, -0.14]	0.08	-3.77	.001
Age	0.04	[0.02, 0.07]	0.01	3.17	.002
SMQ	0.34	[0.17, 0.51]	0.09	3.91	<.001
Condition:Age	-0.01	[-0.03, 0.01]	0.01	-1.03	.306
Condition:SMQ	0.01	[-0.11, 0.13]	0.06	0.13	.896

The age effect on enjoyment is still significant after the FDR correction, as the p value was rounded up

and reward (all $ps \leq 0.007$). There was little evidence that the effects of condition varied as a function of age or social motivation. None of the Condition $\times$ Age interactions were significant, and none of the Condition $\times$ Social Motivation interactions reached significance (Fig. 2).

Qualitative analysis

Seventy-two participants also completed open-ended questions about their health-related PM. The open-ended questions were included at the point of preregistration and therefore only presented to 72 participants (out of the 116 participants).

Question 1: What health-related tasks do you regularly have to remember to carry out?

When asked about the type of health-related PM tasks which needed to be carried out regularly in their daily lives, the majority of participants mentioned medication management (adhering to medication, ordering and picking up prescriptions) and attending medical appointments: *“Taking high blood pressure pills at regular time daily”* [p63]. The use of routine and reminders from healthcare providers was highlighted as supporting PM. Carrying out exercise and fitness were also mentioned frequently as being an important and prioritised task in maintaining health, both physically and mentally: *“I exercise when I get up every morning as a matter of routine”* [p49]. Seventeen participants took daily vitamins or supplements: *“I take a comprehensive daily vitamin tablet and find I often forget it. I try to place it in a prominent position in order to SEE it then TAKE it, but this does not always work.”* [p52]. A small number of participants mentioned carrying out tasks for others, usually reminding their partner of taking medications or attending health appointments: *“Remind my partner to take her medication. Make sure my partner eats enough and eats the right things. Keep her supplied with enough water at all times.”* [p55] (See Table 3).

Question 2: Do you find it easier to remember social commitments or health-related tasks? Why do think this is the case?

When asked whether they found it easier to remember health or social tasks, more participants said health tasks (See Table 4). They often explained that these tasks were more important and embedded in their routine, which made them easier to remember. For instance, *“Exercise is in a routine which is well embedded”* [p24] and *“As my health-related tasks are part of my routine I need no reminders”* [p50].

However, a similar number of participants reported equivalence in remembering social and health tasks. Participants who found both similarly easy attributed this to not having many tasks to remember and having strategies in place for both (e.g. tasks written down), which meant they were remembered equally well.

Fig. 2 Estimated marginal means for each motivation question by social context condition. *Note:* Points represent estimated marginal means derived from linear mixed-effects models. Error bars represent 95% confidence intervals. Higher scores indicate greater perceived effort, enjoyment, impact, relatedness, and reward

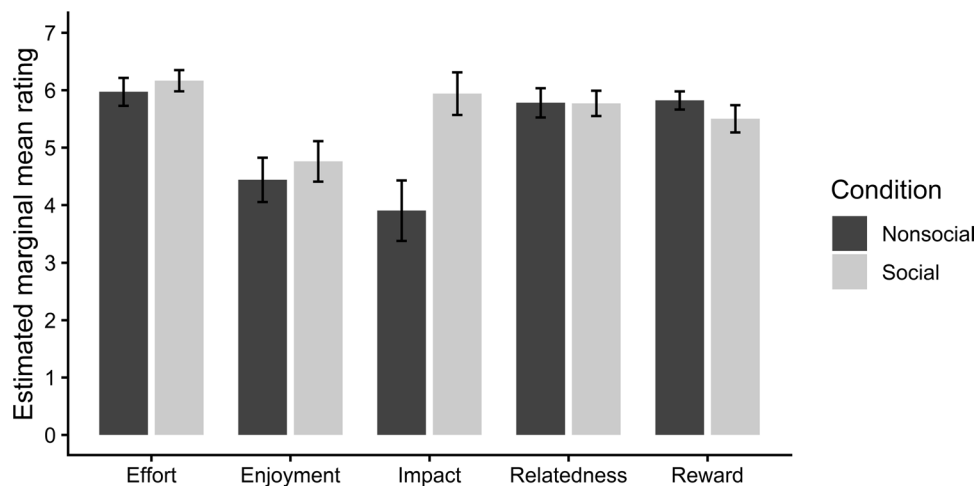


Table 3 Type of PM health tasks most commonly mentioned, number of participants (#) who mentioned each, percentages of participants out of 72, and example quotes

Types of tasks	# of participants	%	Example quotes
Medication Management	58	80.5	<i>"I have pills to remember to take in the morning and at night. (...)" [p28]</i>
Exercise and Fitness	38	52.8	<i>"Going swimming twice a week, going to tai chi." [p24]</i>
Medical Appointments	54	75.0	<i>"(...) also need to remember to make checkup appointments with my GP for diabetes, although this is aided by a reminder from the practice"[p33]</i>
Vitamins and Supplements	17	23.6	<i>"I have to remember to take vitamins in the morning." [p5]</i>
Tasks for others	5	6.94	<i>"(...) I also have to remember to ensure that my husband attends his medical appointments." [p16]</i>

Table 4 Perceived easiness of health-related versus social PM tasks, number of participants (#) who mentioned each, percentages of participants out of 72, and example quotes

Health vs. social PM tasks	# of participants	%	Example quotes
Social	8	11.1	<i>"Social commitments as they are usually enjoyable" [p69]</i>
Health	32	44.4	<i>"I think I find it easier to remember health-related tasks because they are more important" [p26]</i>
Both/Neither	32	44.4	<i>"I don't think either task takes preference" [p6] "I remember both equally" [p17]</i>

Table 5 Involvement of others in health-related PM tasks: who is helped, number of participants (#) who mentioned each, percentages of participants out of 72, and example quotes

Do you help remind others?	# of participants	%	Example quotes
Partner	25	34.7	<i>"I assist my wife and put in my diary her tasks" [p2]</i>
Family member	10	13.9	<i>"I help my family and close friends, and it gives me great joy and sense of fulfilment." [p60]</i>
Friend/peer	6	8.33	<i>"Yes, an elderly friend. It makes me feel I am doing something worthwhile." [p20]</i>
Yes (unspecified)	5	6.94	<i>"Reminding someone about appointment makes me feel good that I can help." [p40]</i>
No-one	26	36.1	<i>"No, I live on my own" [p48] "It is not the case. But I like to help if needed." [p7]</i>

Finally, the minority of participants who described social tasks as easier to remember, viewed these tasks as more positive and inherently motivating: *"They are something enjoyable which makes them easier to remember because enjoyable things I look forward to"* [p56].

Question 3: Is there anyone you help by reminding them of appointments, tasks or events? How does it make you feel to help?

Many participants reported helping their partner, a family member or a friend/peer to remember their health-related PM tasks (See Table 5). The majority of these participants described positive emotions as a result of helping close others: *"This makes me feel that, in a genuine way, I am expressing my support and concern for my friend"* [p1] and *"I help my family and close friends, and it gives me great joy and sense of fulfilment"* [p60].

Twenty-six participants responded that they did not help remind others of such tasks; however, several participants described similar positive emotions if they were to help others or described previous experience in doing so: *"Not now. There were times in my life that I did, and it felt very gratifying"* [p30].

Discussion

The current study was the first to investigate whether providing a social context for health-related PM scenarios would increase motivation to fulfil the task in older adults. Given that our motivation questions did not fit into a single factor model, we analysed each of the five questions separately.

Participants reported higher scores for effort and enjoyment in social compared to non-social contexts. These questions were both intrinsic motivation items, based on questions from the IMI (Ryan 1982). These findings suggest that participants in the current study were intrinsically more motivated to put effort into social tasks and expected to find them more enjoyable compared to non-social tasks. In contrast, participants reported higher personal reward for non-social tasks over social tasks. This is interesting as the reward question was also based on an IMI item but was influenced by social context in the opposite direction to effort and enjoyment. This highlights that there are several different aspects of intrinsic motivation which can be influenced in opposite directions by task heuristics. Alternatively, it is possible that participants interpreted the item (which asked about the level of 'personal reward' experienced) as lower if the task related to someone other than self. There was a strong effect of the social context manipulation on the impact question, where participants self-reported that the impact on others would be higher for tasks with a social aspect compared to non-social tasks. Finally, the relatedness question showed no difference in motivation scores between social and non-social tasks, which indicated that participants found both types of tasks equally relevant to their own everyday experiences.

In relation to enjoyment, effort and impact, findings supported our hypothesis of higher motivation in social compared to non-social scenarios. Overall, the findings align with existing literature indicating that social context increases motivation for future intentions (Altgassen et al. 2010; Penningroth et al. 2013; Peter and Kliegel 2018). General social motivation (measured by SMQ scores) was also linked to increased motivation scores in all five models, suggesting that responses to the health scenarios were related to more general motivation.

Exploratory analyses revealed that motivation increased with age in both social and non-social scenarios (see also Kvavilashvili and Fisher (2007) for evidence of increased intrinsic motivation with age). Even within a group of older adults, the oldest seem to be more motivated, independent of social aspects, addressing our first exploratory hypothesis. When examining the individual motivation questions, age was found to have an impact on both enjoyment and reward, indicating that the importance of these aspects of motivation to carry out health tasks increases with age independent of social aspects of the scenario. One speculation is that motivation increases with age because the amount of health tasks increases and the desire to stay healthy motivates the oldest adults to remember these specific tasks. For older adults, taking care of their health is key to staying independent and the worry about losing one's independence can enhance the focus on health tasks, integrating these tasks more into daily life. This motivation is reflected in the qualitative data, for example *"I find it a little easier to remember health commitments, probably because the consequence for missing one of those commitments may be greater"* [p33] and is also in line with Motivational-Cognitive Model of PM (Penningroth and Scott 2007), where motivation to perform PM tasks is believed to increase when goals are viewed as personally important.

Our qualitative content analysis of open-ended questions highlighted the importance of routine as well as increased motivation associated with helping others to remember. Results also revealed that the most common PM health-related tasks were medication management (Zogg et al. 2012) and health appointments (Fink et al. 2014). Interestingly, only 8/72 participants regarded social tasks as easier to remember compared to health tasks. This is contrary to previous research, which found social tasks were regarded as more important (Schnitzspahn et al. 2016; Nygaard et al. 2025), and thereby prioritised more (Haas et al. 2020).

Limitations and future directions

One limitation is that the sample was primarily comprised of relatively healthy and more digitally confident older adults. This may limit the generalisability of the findings to older adults with poorer physical health, cognitive difficulties and lower digital literacy. Although we designed our scenarios to resemble real-life tasks, which has been found to enhance PM for older adults (Menéndez-Granda et al. 2025), they were artificial scenarios which limits ecological validity. Further, the social aspect of the scenarios was heterogeneous, which makes it difficult to pinpoint what aspect of sociality is producing the effect: Future studies could explore more specific manipulations of, for example, social closeness to explore motivational mechanisms in more detail. The purpose of this study was to assess motivation, so we did not include a performance measure of PM. Therefore, we cannot address whether participants actually carried out the tasks they were presented with in their daily life. However, we suggest that future studies include an objective behavioural PM measure to examine whether these motivational measures result in actual behaviour change in PM.

In the open-ended questions, most participants mentioned several aspects, which mapped onto examples we gave them (i.e. adhering to medications, attending medical appointments or taking exercise): *“All three, taking medication and supplements daily/twice daily, attending varied medical/hospital appointments, taking exercise”* [p40]. In future research, more in-depth follow-up open-ended questions would combat this limitation. Further, the open-ended question about whether health or social intentions are regarded as easier is not matched in the quantitative data, and therefore, only a tentative response can be drawn from the results. It would also be relevant to ask participants about their motivation for non-health tasks to allow for comparison with health tasks.

Despite limitations, the findings create the potential for future studies to use the social aspect, perhaps in the shape of social cues to motivate older adults to carry out their PM tasks, particularly related to their health. Another beneficial avenue for future research would be to focus more on individual differences (Grob et al. 2022) through exploration of social motivation which is essential for understanding healthy ageing and shift in perception of personal goals (Isaacowitz et al. 2021). This could be investigated through participants’ inherent interests, e.g. by providing social motives which were suggested to be more likely to enhance motivation (Walter and Meier 2014). Future studies might also focus on the age-PM paradox (older adults outperforming younger adults in naturalistic PM tasks; Schnitzspahn et al. 2020; Menéndez-Granda et al. 2025) and compare how a social aspect might motivate younger, middle-aged, and older adults in their health-related PM tasks (Altgassen et al. 2010; Niedźwieńska and Barzykowski 2012). Age group differences in the effects of social manipulations are of particular interest, because the socioemotional selectivity theory predicts that older adults may be more motivated than younger adults to prioritise tasks concerning close others in particular (Carstensen 2021).

Implications

Taken together, the current study has practical implications for implementing aspects of social motivation in future PM strategies and interventions. For instance, Keil et al. (2025)’s findings on a bidirectional prediction between PM and social support could be translated into using mutually beneficial social support to motivate older adults to remember their future intentions. Further, a recent qualitative review showed that peer relationships could help support physical exercise in older adults (Palombi et al. 2025). Penningroth (2011) suggested reframing PM tasks into social tasks, for example, someone who has trouble adhering to their medications could reframe the task to benefit their family. Moreover, the findings fill a theoretical gap by investigating the link between motivation to carry out PM intentions and social motivation in ageing for health-related future tasks.

Conclusion

The present study indicated higher self-reported motivation to carry out health-related future intentions in social compared to non-social scenarios. Some aspects of motivation (impact on others, effort & enjoyment) were enhanced by social context, while others (personal reward & relatedness) were not. Content analysis of open-ended questions found health-related tasks were regarded as easier to remember than social tasks and that the most common tasks were medication adherence, medical appointments, and exercising. The findings have implications for enhancing PM ability through social motives, which can aid independent living and quality of life for older adults.

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References

- Altgassen M, Kliegel M, Brandimonte M, Filippello P (2010) Are older adults more social than younger adults? Social importance increases older adults' prospective memory performance. *Aging Neuropsychol Cogn* 17(3):312–328. <https://doi.org/10.1080/13825580903281308>
- Appelbaum M, Cooper H, Kline RB, Mayo-Wilson E, Nezu AM, Rao SM (2018) Journal article reporting standards for quantitative research in psychology: the APA publications and communications board task force report. *Am Psychol* 73(1):3–25. <https://doi.org/10.1037/amp0000191>
- Barr AH (1984) Global and local deformations of solid primitives. *ACM Siggraph Comput Graph* 18(3):21–30. <https://doi.org/10.1145/964965.808573>
- Benjamini Y, Hochberg Y (1995) Controlling the false discovery rate: a practical and powerful approach to multiple testing. *J Roy Stat Soc: Ser B (Methodol)* 57(1):289–300. <https://doi.org/10.1111/j.2517-6161.1995.tb02031.x>
- Brom SS, Schnitzspahn KM, Melzer M, Hagner F, Bernhard A, Kliegel M (2014) Fluid mechanics moderate the effect of implementation intentions on a health prospective memory task in older adults. *Eur J Ageing* 11(1):89–98. <https://doi.org/10.1007/s10433-013-0288-2>
- Brown MT, Bussell J, Dutta S, Davis K, Strong S, Mathew S (2016) Medication adherence: truth and consequences. *Am J Med Sci* 351(4):387–399. <https://doi.org/10.1016/j.amjms.2016.01.010>
- Carstensen LL (1991) Socioemotional selectivity theory: social activity in life-span context. *Annu Rev Gerontol Geriatr* 11(1):195–217
- Carstensen LL (2021) Socioemotional selectivity theory: the role of perceived endings in human motivation. *Gerontologist* 61(8):1188–1196. <https://doi.org/10.1093/geront/gnab116>
- Carstensen LL, Isaacowitz DM, Charles ST (1999) Taking time seriously: a theory of socioemotional selectivity. *Am Psychol* 54(3):165–181. <https://doi.org/10.1037/0003-066X.54.3.165>

- Einstein GO, McDaniel MA (1996) Retrieval processes in prospective memory: theoretical approaches and some new empirical findings. In: Brandimonte M, Einstein GO, McDaniel MA (eds) *Prospective memory: theory and applications*. Lawrence Erlbaum Associates Publishers, pp 115–141
- El Haj M, Moustafa AA, Allain P (2022) Social commitment toward prospective memory tasks in cognitively impaired non-demented individuals. *Appl Neuropsychol Adult* 29(4):643–650. <https://doi.org/10.1080/23279095.2020.1799791>
- Fink N, Cartee N, Pak R (2014) Using focus groups to examine prospective memory strategies in the medication management of older adults. *Proc Human Factors Ergon Soc Annu Meet* 58(1):165–169. <https://doi.org/10.1177/1541931214581035>
- Germain CM, Hess TM (2007) Motivational influences on controlled processing: moderating distractibility in older adults. *Aging Neuropsychol Cogn* 14(5):462–486. <https://doi.org/10.1080/13825580600611302>
- Gong X, Seaman KL, Fung HH, Loeckenhoff C, Lang FR (2019) Development and validation of social motivation questionnaire. *Gerontologist* 59(6):e664–e673. <https://doi.org/10.1093/geront/gny121>
- Grob E, Ghisletta P, Kliegel M (2022) The role of non-cognitive factors in prospective memory in older adults. *J Ageing Longev* 2(3):214–227. <https://doi.org/10.3390/jal2030018>
- Guo Y, Gan J, Wang Z, Li Y (2024) The promotional effect of prosocial motivation on time-based prospective memory. *PsyCh J* 13(3):421–428. <https://doi.org/10.1002/pchj.738>
- Haas M, Mehl MR, Ballhausen N, Zuber S, Kliegel M, Hering A (2020) The sounds of memory: extending the age-prospective memory paradox to everyday behavior and conversations. *J Gerontol B Psychol Sci Soc Sci* 77(4):695–703. <https://doi.org/10.1093/geronb/gbac012>
- Hering A, Kliegel M, Rendell PG, Craik FI, Rose NS (2018) Prospective memory is a key predictor of functional independence in older adults. *J Int Neuropsychol Soc* 24(6):640–645. <https://doi.org/10.1017/S1355617718000152>
- Horn SS, Freund AM (2021) Adult age differences in remembering gain-and loss-related intentions. *Cogn Emot* 35(8):1652–1669. <https://doi.org/10.1080/02699931.2021.1986375>
- Hu LT, Bentler PM (1999) Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Model* 6(1):1–55. <https://doi.org/10.1080/10705519909540118>
- Insel KC, Einstein GO, Morrow DG, Hepworth JT (2013) A multifaceted prospective memory intervention to improve medication adherence: design of a randomized control trial. *Contemp Clin Trials* 34(1):45–52. <https://doi.org/10.1016/j.cct.2012.09.005>
- Insel KC, Einstein GO, Morrow DG, Koerner KM, Hepworth JT (2016) Multifaceted prospective memory intervention to improve medication adherence. *J Am Geriatr Soc* 64(3):561–568. <https://doi.org/10.1111/jgs.14032>
- Isaacowitz DM, Freund AM, Mayr U, Rothermund K, Tobler PN (2021) Age-related changes in the role of social motivation: implications for healthy aging. *J Gerontol B Psychol Sci Soc Sci* 76(Supplement_2):S115–S124. <https://doi.org/10.1093/geronb/gbab032>
- Keil J, Wister A, Pauly T (2025) Association of prospective memory and social wellbeing in midlife to old age in the Canadian Longitudinal Study on Aging. *Int J Behav Dev* 49(4):365–375. <https://doi.org/10.1177/0165025424130554>
- Kvavilashvili L, Fisher L (2007) Is time-based prospective remembering mediated by self-initiated rehearsals? Role of incidental cues, ongoing activity, age, and motivation. *J Exp Psychol Gen* 136(1):112–132. <https://doi.org/10.1177/01650254241305547>
- Menéndez-Granda M, Schmidt N, Laera G, Clenin A, Kliegel M, Orth M, Peter J (2025) Factors explaining age-related prospective memory performance differences: a meta-analysis. *J Gerontol B Psychol Sci Soc Sci*. <https://doi.org/10.1093/geronb/gbaf020>
- Molloy GJ, Messerli-Bürgy N, Hutton G, Wikman A, Perkins-Porras L, Steptoe A (2014) Intentional and unintentional non-adherence to medications following an acute coronary syndrome: a longitudinal study. *J Psychosom Res* 76(5):430–432. <https://doi.org/10.1016/j.jpsychores.2014.02.007>
- Niedźwieńska A, Barzykowski K (2012) The age prospective memory paradox within the same sample in time-based and event-based tasks. *Aging Neuropsychol Cogn* 19(1–2):58–83. <https://doi.org/10.1080/13825585.2011.628374>
- Nygaard MA, Rubínová E, Allan JL, Phillips LH (2025) Understanding older adults' experience of prospective memory errors and strategy use. *Appl Cogn Psychol* 39(3):e70066. <https://doi.org/10.1002/acp.70066>
- Palombi T, Chirico A, Cazzolli B, Zacchilli M, Alessandri G, Filosa L, Borghi A, Fini C, Antonucci C, Pistella J, Alivernini F, Baiocco R, Lucidi F (2025) Motivation, psychological needs and physical activity in older adults: a qualitative review. *Age Ageing* 54(7):afaf180. <https://doi.org/10.1093/ageing/afaf180>
- Park DC, Willis SL, Morrow D, Diehl M, Gaines CL (1994) Cognitive function and medication usage in older adults. *J Appl Gerontol* 13(1):39–57. <https://doi.org/10.1177/07334648940130010>
- Penningroth SL, Scott WD (2007) A motivational-cognitive model of prospective memory: the influence of goal relevance. In: Columbus F (ed) *Psychology of motivation*. Nova Science Publishers, pp 115–128
- Penningroth SL, Scott WD (2013) Task importance effects on prospective memory strategy use. *Appl Cognit Psychol* 27(5):655–662. <https://doi.org/10.1002/acp.2945>
- Penningroth SL, Scott WD, Freuen M (2011) Social motivation in prospective memory: higher importance ratings and reported performance rates for social tasks. *Can J Exp Psychol* 65(1):3–11. <https://doi.org/10.1037/a0022841>

- Peter J, Kliegel M (2018) The age-prospective memory paradox: is it about motivation? *Clin Transl Neurosci* 2(2):2514183X18807103. <https://doi.org/10.1177/2514183X18807103>
- Rummel J, Snijder JP, Kvavilashvili L (2023) Prospective memories in the wild: predicting memory for intentions in natural environments. *Mem Cognit* 51(5):1061–1075. <https://doi.org/10.3758/s13421-022-01379-y>
- Ryan RM (1982) Control and information in the intrapersonal sphere: an extension of cognitive evaluation theory. *J Pers Soc Psychol* 43(3):450–461. <https://doi.org/10.1037/0022-3514.43.3.450>
- Ryan RM, Deci EL (2000) Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemp Educ Psychol* 25(1):54–67. <https://doi.org/10.1006/ceps.1999.1020>
- Schnitzspahn KM, Scholz U, Ballhausen N, Hering A, Ihle A, Lagner P, Kliegel M (2016) Age differences in prospective memory for everyday life intentions: a diary approach. *Memory* 24(4):444–454. <https://doi.org/10.1080/09658211.2015.1018276>
- Schnitzspahn KM, Kvavilashvili L, Altgassen M (2020) Redefining the pattern of age-prospective memory-paradox: new insights on age effects in lab-based, naturalistic, and self-assigned tasks. *Psychol Res* 84:1370–1386. <https://doi.org/10.1007/s00426-018-1140-2>
- Walter S, Meier B (2014) How important is importance for prospective memory? A review. *Front Psychol* 5:657. <https://doi.org/10.3389/fpsyg.2014.00657>
- Wolff JK, Warner LM, Ziegelmann JP, Wurm S, Kliegel M (2016) Translating good intentions into physical activity: older adults with low prospective memory ability profit from planning. *J Behav Med* 39:472–482. <https://doi.org/10.1007/s10865-015-9707-5>
- Zhou Y, Wang M, Tian Y, Guo Y (2025) High social motivation can promote time-based prospective memory performance. *Behav Sci (Basel)* 15(8):1015. <https://doi.org/10.3390/bs15081015>
- Zogg JB, Woods SP, Saucedo JA, Wiebe JS, Simoni JM (2012) The role of prospective memory in medication adherence: A review of an emerging literature. *J Behav Med* 35:47–62. <https://doi.org/10.1007/s10865-011-9341-9>

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