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Purpose and meaning in life and the trajectory of episodic memory in eight longitudinal samples

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Abstract

Background: Higher purpose and meaning in life are associated with lower risk of Alzheimer's disease and related dementias. Change in memory over time may be an early indicator of oncoming cognitive impairment and, even in the absence of impairment, memory change is associated with reduced quality of life in older adulthood. Purpose has been associated with better episodic memory performance when measured concurrently; less is known about whether purpose is associated with change in memory over time.

Objective: To examine the association between purpose and declines in memory over time in multiple cohorts.

Methods: The analyses included eight established cohort studies (total $N = 117{,}466$) that measured purpose or meaning and had repeated assessments of episodic memory with follow-ups from 5 to 22 years (577,382 total memory assessments). Multilevel models tested whether purpose was associated with the level and slope of episodic memory.

Results: A random-effects meta-analysis indicated that purpose was related to the level (intercept meta-analytic estimate $= 0.26$, $p < 0.001$) but not the slope of episodic memory over time (slope meta-analytic estimate $= 0.00$, $p = 0.421$). Age and study-level moderators (number memory assessments, follow-up interval and length, memory task, measure content, location, mean sample age) did not account for heterogeneity.

Conclusions: Purpose in life is associated consistently with the average level of episodic memory but not how it changes over time. The association between purpose in life and lower risk of Alzheimer's disease may be due, in part, to the higher average level of episodic memory rather than less systematic decline in memory over time.

Keywords

Alzheimer's disease, episodic memory, longitudinal, meaning in life, memory trajectory, purpose in life

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Introduction

Purpose in life, the feeling that one's life is goal-oriented and has direction,[1] is associated consistently with better cognitive health.[2–5] When measured concurrently, purpose is associated with better performance on cognitive tasks.[6,7] When measured over time, purpose is associated with slower global cognitive decline.[8,9] This better function culminates in healthier cognitive outcomes in older adulthood: Among cognitively healthy individuals, higher purpose in life is associated with a lower risk of developing dementia over time.[10]

Episodic memory is the recollection of personal experiences, events, and situations commonly measured with word list tasks,[11] and an aspect of cognition critical for health, everyday functioning, financial and medical management, social interactions, and overall independence in older adulthood. Deficits in episodic memory, for example, are one of the clinical hallmarks of Alzheimer's disease and related dementias.[12] Further, worse episodic memory performance earlier in adulthood is a risk factor for dementia in older adulthood,[13] and poor memory is a

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risk factor for institutionalization.[14] Memory decline is also apparent prior to cognitive impairment[15] and, regardless of cognitive status, is associated with declines in quality of life[16] and the ability to carry out complex daily tasks (e.g., instrumental activities of daily living such as managing finance or medications) that are necessary for independent living.[17] As such, poor episodic memory may precipitate the need to leave one's community and be a marker of worse cognitive health that culminates in impairment. Maintaining episodic memory is thus critical for better health and well-being in older adulthood.

There are several reasons why purpose in life may be associated with better episodic memory. Purpose is associated with healthier blood pressure[18] and glucose regulation,[19] that contribute to cognition, including better memory function.[20,21] Healthier inflammatory profiles have also been associated with both purpose and better episodic memory.[22] Individuals higher in purpose tend to engage in more physical[23,24] and cognitive[25] activities that also support better memory.[26] Purpose in life is further associated with greater social integration, including better relationships[27] and less loneliness,[28] which are likewise associated with better memory.[29] These factors may be possible reasons why purpose is associated with better memory measured concurrently and may further help to maintain memory function over time.

There are other theoretical reasons why purpose may be associated with better episodic memory. It has been argued that purpose should be considered a prospective construct because pursuing a purpose necessarily entails envisioning oneself in the future.[30] How individuals pursue their meaningful goals is tied to how they think about their past.[31] Life review has been associated with increases in purpose,[32] presumably in part because reminiscence provides continuity of the self and connection with a broader life story.[33] As such, although purpose may actively encourage individuals to think about themselves and what they can accomplish in the future, it is also tied to past experiences and the memory of those experiences.[34] Individuals higher in purpose may have better episodic memory performance because they may use their memories as a basis for striving for their future goals.

Theoretically, purpose in life can be differentiated from meaning in life. Specifically, meaning in life is an overarching construct that encompasses feelings that one's life is goal oriented (purpose), as well as feelings that the world is orderly (coherence), and that one's life has value (significance).[35] These factors are related but theoretically distinct.[36] The general public, however, may not make these distinctions when reporting on their purpose and meaning and thus may capture similar variance for important outcomes. In the cognitive literature, for example, the association with cognitive function[6] and dementia[10] do not statistically differ between purpose in life and meaning in life.

Previous research on purpose and meaning and episodic memory has focused primarily on the cross-sectional association[6,7] or the relation with risk for incident dementia,[10] in which memory function is a substantial component of the assessment of dementia.[12] Related work on cognitive decline more generally has found that purpose is associated with slower decline over time.[8,9] The present research builds on this foundational work to test the association between purpose and change in episodic memory over time. We examine this association across multiple datasets to evaluate its robustness and test for moderators that may explain differences across samples. Given the previous literature on the cross-sectional association between purpose and episodic memory[6,7] and the literature on the longitudinal association between purpose and slower cognitive decline[8,9] and lower risk of dementia,[10] we expect higher purpose will be associated with both higher average memory performance and slower decline in memory over time. We test these associations in the individual samples and then combine the results in a meta-analysis.

Note that Sutin et al. (2022)[6] included cross-sectional data from the Health and Retirement Study, the Midlife Development in the United States study, the National Health and Aging Trends Study, the Wisconsin Longitudinal Study, the English Longitudinal Study of Ageing, the Survey of Health, Ageing and Retirement in Europe, The Irish LongituDinal Study on Aging that are also included in the current analysis of longitudinal data.

Methods

Participants

Longitudinal cohort studies were selected for inclusion in the analysis if they had a measure of purpose in life and at least two longitudinal assessments of episodic memory. We identified eight cohort studies that fit these criteria: the Health and Retirement Study (HRS; https://hrs.isr.umich.edu/), the Midlife Development in the United States study (MIDUS; http://midus.wisc.edu/), the National Health and Aging Trends Study (NHATS; https://www.nhatsdata.org/), the Wisconsin Longitudinal Study (WLS; https://www.ssc.wisc.edu/wlsresearch/), the English Longitudinal Study of Ageing (ELSA; https://www.elsa-project.ac.uk/), the Survey of Health, Ageing and Retirement in Europe (SHARE; http://www.share-project.org/), The Irish LongituDinal Study on Aging (TILDA; https://tilda.tcd.ie/), and the Japanese Study of Aging and Retirement (JSTAR; https://www.rieti.go.jp/en/projects/jstar/). These datasets were identified from a search of the Gateway to Global Aging for longitudinal cohorts with relevant data and author knowledge of public datasets. Datasets with data available to the public were included. Data for each study are available to the public upon free user registration through these websites.

Participants in each study were included in the analytic sample if they reported on their purpose in life, had at least one assessment of memory, and had information on relevant sociodemographic characteristics (age, sex, race, education). Descriptive statistics for each sample are in Table 1. A description of each sample is in Supplemental Material as is additional descriptive information (Supplemental Table 1). This study was preregistered (https://osf.io/y3rgm/?view_only=4a4623bc7ba046afb30587f9bdb6722e).

Measures

Purpose in life. In each cohort, the first assessment of purpose or meaning in life concurrent with episodic memory was used in the analysis. Purpose in life in HRS, MIDUS, and WLS was measured with the Purpose in Life subscale from the Ryff Scales of Psychological Well-Being.[1] Items were rated on a scale and reverse scored when necessary from 1 (strongly disagree) to 6 (strongly agree) in HRS (7 items) and WLS (6 items), and from 1 (strongly disagree) to 7 (strongly agree) in MIDUS (7 items). The alpha for the scale was 0.77 in HRS, 0.69 in WLS, and 0.70 in MIDUS. Sense of purpose was measured in ELSA, TILDA, SHARE, and JSTAR with a single item ("How often do you feel that your life has meaning?") from the Pleasure scale of the control-autonomy-pleasure-self-realization scale (CASP-19) of quality of life in older adulthood.[37] The item was rated on a 4-point scale in ELSA, TILDA, SHARE, and JSTAR and reverse scored when necessary from 1 (never) to 4 (often). Sense of purpose in NHATS was measured with a single item ("My life has meaning and purpose.") on a 3-point scale from 1 (agree a lot) to 3 (agree not at all) and reverse-scored in the direction of greater purpose.

Episodic memory. Each cohort administered a standard episodic memory task. Participants were read a list of words that they had to recall immediately and again after a brief delay. Every study except MIDUS used a list of 10 words. Episodic memory was scored as the sum of words recalled correctly across the immediate and delayed tasks. The possible score could thus range from 0 to 20. All cohorts used the same task with two exceptions: MIDUS used a 15-item list, for a maximum score of 30, and JSTAR only measured immediate recall in the longitudinal assessment of memory, for a maximum score of 10.

Statistical approach

Analyses were performed in *R* 4.4.3 (R Core Team, 2025). Linear mixed-effects (variable intercept) models were tested using *lmer* from the *lme4* 1.1–23[38] package. Purpose in life scores were standardized within each cohort before analysis. As such, coefficients for purpose can be interpreted as a one standard deviation difference in purpose. The association between purpose and both the intercept (mean episodic memory) and slope (change in episodic memory over time) of memory were tested controlling for age, sex, education, race and ethnicity (where applicable). All available measurements of episodic memory were used in the analysis, including those that preceded the first measurement of purpose; purpose was measured at the same time as one of the memory assessments. Time was centered at the time of the purpose measurement.

The main analysis used all assessments of memory available in each sample. Supplemental analysis excluded memory assessments prior to the assessment of purpose. A sensitivity analysis tested the association with the slope separately for immediate and delayed recall. An additional model tested whether the association between purpose and time was moderated by age. This moderation was tested with a three-way interaction between purpose, time, and age (at the time of purpose assessment), as well as all lower-order interactions (purpose and time, purpose and age, time and age). The *summ* function in *jtools* 2.1.1[39] was used to calculate Satterthwaite degrees of freedom and structure outputs.

STATA was used to summarize the results of the individual samples in a random-effect meta-analysis. Meta-regression was used to test whether the association between purpose and the slope of memory varied by the following study characteristics: number of memory assessments, maximum length of follow-up interval, maximum time between memory assessments, average time between memory assessments, memory task (possible score of 20 vs. others), whether the content of the measure was primarily purpose versus meaning, location (United States versus others), and mean sample age at baseline.

Finally, for cohorts that had information on dementia status (HRS, NHATS, SHARE, ELSA, TILDA; see supplemental material for how dementia was identified in each cohort), two additional analyses were conducted. The first analysis excluded participants who developed dementia at any point in the study. The second analysis only included the participants who developed dementia at any point in the study. Across all analyses, the alpha level was set to $p < 0.01$ to balance concerns between type 1 and type 2 errors because of the number of statistical tests.

Results

Figure 1 shows the meta-analysis of the association between purpose in life and both the intercept (Figure 1A) and slope (Figure 1B) of episodic memory (estimates are also in Supplemental Table 2). Supporting the hypothesis, higher purpose in life was associated with better average episodic memory (intercept) in all samples. The association was significant in the meta-analysis, which is consistent with the

Table 1. Descriptive statistics for all studies.

	HRS	MIDUS	NHATS	WLS	ELSA	SHARE	TILDA	JSTAR
Age (y)	64.44 (10.93)	54.7 (11.06)	76.17 (7.44)	65.12 (3.95)	62.78 (10.26)	66.83 (9.91)	62.39 (9.09)	66.53 (6.89)
Age range	18–104	33–83	65–107	45–86	23–94	24–102	49–80	52–78
Sex (female)	59.19	56.72	57.23	53.93	55.33	56.83	55.91	51.71
Race (Black)	17.31	2.62	20.54[#]					
Race (Otherwise identified)	7.68	3.62	8.07		3.13 *			
Education	12.80[a] (3.10)	7.62[b] (2.50)	5.32[c] (2.21)	13.93[a] (2.45)	4.28[d] (2.27)	11.01[a] (4.38)	3.80[e] (1.56)	2.17[f] (1.29)
Purpose in life	4.62 (0.94)	5.58 (0.95)	2.83 (0.42)	4.75 (0.75)	3.51 (0.74)	3.55 (0.71)	3.73 (0.59)	2.97 (0.81)
Episodic memory	9.99 (3.26)	11.89 (4.46)	8.35 (3.22)	10.33 (3.45)	10.46 (3.49)	9.26 (3.50)	12.00 (3.53)	5.29 (1.48)
Memory assessments (MA)	7.93 (3.27)	2	6.13 (3.12)	2.58 (0.49)	5.70 (2.45)	3.99 (1.38)	3.64 (0.68)	2.38 (0.49)
MA (range)	2–13		2–11	2–3	2–9	2–7	2–4	2–3
Length of follow-up	7.47 (4.39)	9.40 (1.16)	5.24 (3.14)	12.78 (4.73)	8.13 (4.83)	2.99 (1.38)	5.82 (1.55)	4.08 (0.98)
Max follow-up	14	14	10	18.83	14	6	8	4.99
Time	14.42 (6.61)	9.40 (1.16)	5.24 (3.14)	12.78 (4.73)	9.87 (4.91)	7.41 (4.63)	5.82 (1.55)	4.08 (0.98)
Max time	24	14	10	18.83	16	18	8	4.99
Dementia status (yes)	12.23		19.55		4.05	2.53		
N	21567	2292	7998	5917	13597	58488	6290	1317

Numbers are means (standard deviations) or percentages (n) of available data, i.e., data are missing for some respondents. HRS: Health and Retirement Study; MIDUS: Midlife Development in the United States study; NHATS: National Health and Aging Trends Study; WLS: Wisconsin Longitudinal Study; ELSA: English Longitudinal Study of Ageing; SHARE: Survey of Health, Ageing and Retirement in Europe; TILDA: The Irish LongituDinal Study on Aging; JSTAR: Japanese Study of Aging and Retirement; ICC: intraclass correlation coefficient. [#]Non-Hispanic. * Non-white was only category present. [a]Education in years. [b]Education on a scale from 1 (no school/some grade school) to 12 (doctoral or professional degree). [c]Education on a scale from 1 (no schooling completed) to 9 (master's, professional, or doctoral degree). [d]Education in non-ordered categories. [e]Education from 0 (no formal education) to 7 (postgraduate / higher degree). [f]Education from 1 (elementary / middle school) to 7 (PhD).

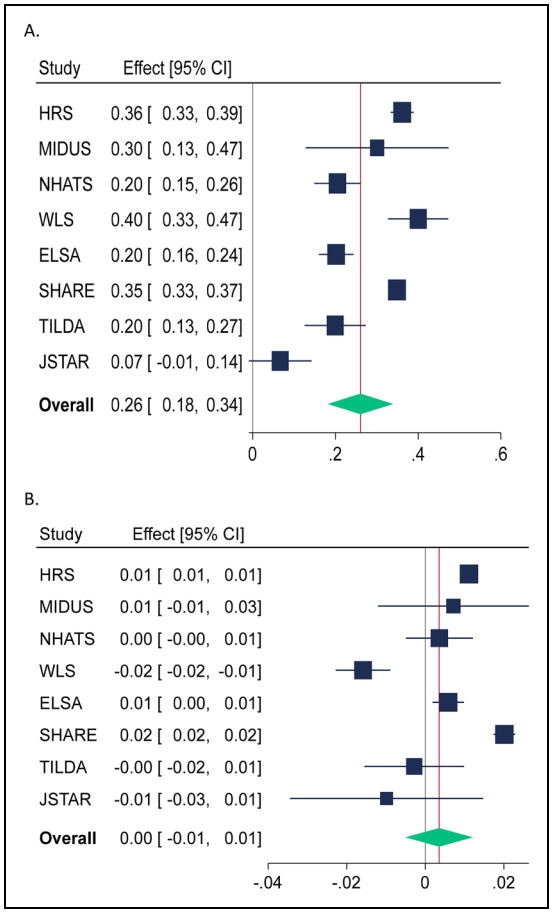

Figure 1. Forest plot of the association between purpose in life and the intercept (A) and the slope (B) of episodic memory.

cross-sectional analysis between purpose and episodic memory reported previously using most of these samples.[6]

In contrast to the hypothesis, the association between purpose and the slope of episodic memory was not consistent across samples. This association was in the expected positive direction and significant in HRS, ELSA, and SHARE, in the opposite negative direction and significant in WLS, and not significant in MIDUS, NHATS, TILDA, and JSTAR. In the meta-analysis, the association between purpose and the slope of episodic memory was null. The meta-analysis of the quadratic effect of time was not significant (estimate = 0.023, 95% CI = -0.035, 0.081, p = 0.432). The association with the slope also remained not significant (estimate = 0.027, 95% CI = -0.030, 0.084, p = 0.354). The association between purpose and the slope of episodic memory was also null if the slope was set to random (meta-analytic effect = 0.00, 95% CI = -0.01, 0.01, p = 0.464; Supplemental Table 3) and when interactions between the sociodemographic factors and time were also included in the model (meta-analytic effect = 0.00, 95% CI = -0.01, 0.01, p = 0.461; Supplemental Table 3). The supplemental analysis that excluded memory assessments prior to the first assessment of purpose likewise indicated that purpose was unrelated to the slope (Supplemental Table 4). Specifically, the association between purpose and slope of memory was 0.00 in the analysis that included all memory assessments, and it was also 0.00 in the analysis limited to memory assessments starting from the baseline assessment of purpose. As such, there was no difference in the association with the inclusion or exclusion of memory assessments prior to the assessment of purpose. The pattern was similar when immediate and delayed recall were tested separately instead of combined into a total score (Supplemental Table 5).

Due to the significant heterogeneity in the intercept ($Q = 123.97$, $p < 0.001$; $I^2 = 95.92$) and slope ($Q = 114.59$, $p < 0.001$; $I^2 = 95.15$), meta-regression was used to assess study characteristics that can potentially explain heterogeneity (Supplemental Table 6). None of the tested moderators was significantly associated with either the intercept or slope, which indicated that the association between purpose and the slope of episodic memory did not vary by number of memory assessments, maximum length of follow-up interval, max time between memory assessments, average time between memory assessments, memory task, purpose versus meaning, location (United States or elsewhere), or average age of the sample. Moderation by age (three-way interaction: purpose×time×age) was significant and in the expected direction in HRS, but null in the other seven samples and meta-analysis. Thus, the association between purpose and the slope of episodic memory did not vary by age (Supplemental Table 7).

Finally, the results of the supplemental analyses for samples that had information on dementia status are in Table 2. As with the meta-analysis on all samples, purpose was associated with the intercept of episodic memory when participants with dementia were excluded from the analysis and when the analysis only included participants who developed dementia during the study period. Also similar to the primary analysis, purpose was unrelated to the slope of episodic memory when participants with dementia were excluded from the analysis and among the subsample with dementia. The association between purpose and the slope of memory among the subsample with dementia, however, was statistically significant in three of the samples (HRS, NHATS, ELSA) and a trend ($p = 0.090$) when aggregated in the meta-analysis. Interestingly, this association was negative, which suggested that higher purpose was associated with greater decline in memory over time. Although counterintuitive, the negative association is consistent with purpose in life as a source of cognitive reserve[40] and important to note here in case future studies find a similar negative association.

Discussion

The present study tested the association between purpose in life and change in episodic memory over time in eight

Table 2. Purpose and the intercept and slope of episodic memory by dementia status.

	Intercept			Slope		
Sample	Estimate	95% CI	p	Estimate	95% CI	p
			Participants with Dementia Excluded from Analytic Sample			
HRS	0.284	0.256, 0.311	<0.001	0.008	0.010, 0.010	<0.001
NHATS	0.152	0.095, 0.209	<0.001	0.005	−0.004, 0.014	0.299
ELSA	0.183	0.141, 0.225	<0.001	0.006	0.002, 0.010	0.006
SHARE	0.325	0.305, 0.345	<0.001	0.018	0.015, 0.021	<0.001
TILDA	0.162	0.088, 0.235	<0.001	−0.008	−0.021,0.005	0.236
Meta-analysis	0.225	0.156, 0.295	<0.001	0.007	−0.000, 0.014	0.059
			Analytic Sample Limited to Participants with Dementia			
HRS	0.348	0.028, 0.416	<0.001	−0.006	−0.012, −0.000	0.042
NHATS	0.061	0.005, 0.117	0.033	−0.017	−0.029, −0.004	0.008
ELSA	0.325	0.097, 0.553	0.005	−0.036	−0.059, −0.014	0.001
SHARE	0.251	0.121, 0.381	<0.001	0.007	−0.011, 0.024	0.443
TILDA	0.179	−0.134, 0.492	0.263	−0.024	−0.083, 0.034	0.416
Meta-analysis	0.229	0.102, 0.356	<0.001	−0.012	−0.027, 0.002	0.090

CI: confidence interval; HRS: Health and Retirement Study; NHATS: National Health and Aging Trends Study; ELSA: English Longitudinal Study of Ageing; SHARE: Survey of Health, Ageing and Retirement in Europe; TILDA: The Irish LongituDinal Study on Aging.

cohorts with follow-ups ranging from about five to 22 years. Contrary to expectation, when aggregated in a meta-analysis, purpose was unrelated to the trajectory of episodic memory, regardless of whether all memory assessments were included in the model or only those starting with the assessment of purpose. There was considerable heterogeneity in the meta-analysis that none of the tested moderators could explain. Although the intercept also had significant heterogeneity that could not be explained, there was a consistent positive association between purpose and the intercept of episodic memory that is similar to previous research published with these samples based on cross-sectional data.[6] This pattern indicates that individuals who perceive their lives to be more purposeful generally have better episodic memory, but these feelings are unrelated to maintaining memory over time.

Although it was surprising that purpose was unrelated to change in episodic memory over time, other well-established protective factors against dementia are unrelated to change in memory.[41,42] A meta-analysis, for example, found that education was unrelated to change in episodic memory over time when aggregated across 39 studies.[43] This meta-analysis further found significant heterogeneity in the association across samples that could not be explained by age or length of follow-up. We likewise found significant heterogeneity that could not be explained by these factors. There is noise in the measurement of episodic memory, especially over time, and it is difficult to reliably detect factors associated with how it changes. Previous research has found that the association between personality and decline in episodic memory was moderated by number of assessments of memory.[44] Specifically, this meta-analysis found that neuroticism and conscientiousness (two traits that are related to purpose in life[45]) were associated with the trajectory of memory in studies that had at least six memory assessments, presumably because the trajectory is more reliable with more assessments. Surprisingly, however, the number of memory assessments did not moderate the association between purpose and the trajectory of memory and thus did not account for the heterogeneity.

There are both empirical and theoretical reasons why purpose should be associated with maintaining memory over time. Empirically, individuals higher in purpose tend to engage in behaviors that help support cognitive function, such as greater physical activity[46] and less use of substances.[47] Purpose is also associated with better hearing health,[48] which also may help support episodic memory.[49] Theoretically, individuals higher in purpose are more future-oriented and thus engage in more goal setting and striving.[50] Such cognitive activity may help support better episodic memory. The results of the current research, however, support this process for average memory performance but not for changes over time.

The null relation between purpose and change in episodic memory is puzzling because there is consistent evidence that purpose is associated with lower risk of incident dementia,[9,10,51] which is defined, in part, by declines in memory.[12] It is possible that this apparent contradiction may be explained partially by the association between purpose and the intercept of episodic memory. It may thus be that individuals higher in purpose have better memory and can experience more decline until it passes the threshold into impairment. Conversely, individuals

with lower purpose may have the same rate of memory decline, but because they start from a lower level, they may reach at an earlier age a level of memory performance that falls within the cognitively impaired range. And because individuals with more purpose start from a higher level of performance on memory task, it is possible that regression to the mean and the fact that they have more "room" to decline may counteract any protective effect of purpose in life.

The present study points to the importance of testing these associations with the same analytic approach in multiple samples.[52] That is, the association between purpose and the slope of memory was positive in some samples, negative in one, and null in others. As such, focusing on the results of any single sample may have led to conclusions that may not have been supported by results from other samples. Meta-analysis has the advantage of aggregating across samples to identify more reliable associations than possible with a single study. Using the raw data from the included studies ensures that the analysis is the same across samples.

The meta-analysis indicated significant heterogeneity for both the intercept and slope. These differences across samples were not accounted for by the factors we tested as moderators. Further, although another study found a small decline in purpose prior to cognitive impairment and a larger decline after onset of cognitive impairment,[53] this change is unlikely to have an effect on the current findings since the supplemental analyses found that the association between purpose and the slope of memory was null regardless of whether the sample excluded participants with dementia or only included participants with dementia. It will be important in future research to identify why purpose is associated with maintaining memory in some samples and declining in others, or whether any significant association is due to chance. For example, although we examined differences by dementia status in studies that had this information, future research would benefit from a more rigorous evaluation of cognitive status—including subjective cognitive decline and mild cognitive impairment—in addition to dementia status as a moderator of memory decline. The next step to understanding the heterogeneity across samples is to better test for a range of potential moderators, ideally in larger samples with clinical evaluations and longer follow-up.

Finally, it is worth noting that among the participants with dementia, although not significant in the meta-analysis, there was a trend ($p = 0.090$) that purpose was associated with greater declines in episodic memory over time, a negative association that was significant in three of the five samples with data to be included in the analysis. Although counterintuitive, it is consistent with the idea of purpose in life as a type of cognitive reserve. That is, individuals with cognitive reserve can withstand neuropathology for longer and then decline quicker when they cross the threshold into cognitive impairment.[40] This compression of morbidity may be preferable since it increases the amount of time the individual can live without impairment and shortens the time with significant impairment. This interpretation for purpose and memory decline should be interpreted with caution because the pattern was not robust across all datasets, and the statistical significance only approached a trend in the meta-analysis. Still, it is important to note to begin to build a literature, particularly if future studies also find this seemingly counterintuitive association.

The present study had several strengths, including the longitudinal design, the use of multiple datasets, a common analytic approach across samples, and population-based cohorts from multiple countries. There are also limitations. First, purpose was measured in different ways across samples. This difference did not explain the heterogeneity across samples, but it will still be important in future work to use the same measure across samples. Second, some of the samples had few longitudinal assessments of memory. Again, this difference did not account for the heterogeneity, but more assessments do help to model a more reliable slope. Third, we only considered episodic memory because it is included in many longitudinal studies and tends to be measured with a similar task across studies. Future research could extend this analysis to other cognitive functions. Fourth, the inclusion of only eight samples provides limited power for meta-regressions, indicating the need for more longitudinal studies to assess purpose and memory, especially to evaluate moderators. Fifth, we did not account for changes in purpose that may occur with cognitive impairment.[53] Finally, although samples came from several countries, more research, particularly in lower- and middle-income countries, is needed to evaluate generalizability. Despite these limitations, the present research indicates that purpose and meaning in life are associated with better average memory performance, but we failed to find that purpose and meaning were associated with changes in memory over time.

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Ethical considerations

All the data used in this study were from de-identified public datasets. Local IRB approval was not needed for use of public data. The parent studies were IRB approved.

Consent to participate

The parent studies obtained written informed consent before testing in each sample.

Author contributions

Angelina R Sutin: Conceptualization; Funding acquisition; Writing - original draft.
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Martina Luchetti: Conceptualization; Writing - review & editing.
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The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data availability statement

Data are available to the public from the parent cohorts (URLs provided in the Method section).

Supplemental material

Supplemental material for this article is available online.

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