





Research Article

Purpose in life and cognitive performance and informant ratings of cognitive decline, affect, and activities

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Abstract

Objective: To examine (1) the association between purpose in life and multiple domains of cognitive function and informant-rated cognitive decline, affect, and activities; (2) whether these associations are moderated by sociodemographic factors, cognitive impairment, or depression; (3) whether the associations are independent of other aspects of well-being and depressive symptoms. **Method:** As part of the 2016 Harmonized Cognitive Assessment Protocol from the Health and Retirement Study, participants completed a battery of cognitive tests and nominated a knowledgeable informant to rate their cognitive decline, affect, and activities. Participants with information available on their purpose in life from the 2014/2016 Leave Behind Questionnaire were included in the analytic sample ($N = 2,812$). **Results:** Purpose in life was associated with better performance in every cognitive domain examined (episodic memory, speed-attention, visuospatial skills, language, numeric reasoning; median $\beta = .10$, $p < .001$; median $d = .53$). Purpose was likewise associated with informant-rated cognitive decline and informant-rated affective and activity profiles beneficial for cognitive health (median $\beta = .18$, $p < .001$; median $d = .55$). There was little evidence of moderation by sociodemographic or other factors (e.g., depression). Life satisfaction, optimism, positive affect, and mastery were generally associated with cognition. When tested simultaneously with each other and depressive symptoms, most dimensions were reduced to non-significance; purpose remained a significant predictor. **Conclusions:** Purpose in life is associated with better performance across numerous domains of cognition and with emotional and behavioral patterns beneficial for cognitive health that are observable by knowledgeable others. These associations largely generalize across demographic and clinical groups and are independent of other aspects of well-being.

Keywords: purpose in life; HCAP; cognitive function; informant ratings; cognitive domains; well-being

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Purpose in life is an aspect of well-being that reflects the feeling that one's life is goal-oriented, driven, and has direction (McKnight & Kashdan, 2009; Ryff, 1989). Purpose has been associated consistently with better cognitive health outcomes in older adulthood (Sutin et al., 2021). Individuals with a greater sense of purpose, for example, have lower risk of developing incident dementia over time than individuals with less purpose, an association that has been replicated in at least eight samples (Sutin et al., 2023). The better cognitive outcomes associated with purpose may be due, in part, to the healthier lifestyles and greater cognitive and social engagement associated with it (Kim et al., 2022; Sutin et al., 2021; Sutin et al., 2023).

The association between purpose in life and cognition extends beyond dementia to specific aspects of cognitive function. Most work on purpose and cognitive function has focused on global cognitive function, episodic memory, and verbal fluency (Boyle et al., 2010; Sutin et al., 2022; Windsor et al., 2015). Some work has also found the positive association between purpose and cognition extends to other cognitive functions, including visuospatial ability, verbal learning, perceptual speed, processing speed, and working memory (Estrella et al., 2021; Wagner et al., 2022). Yet, other

studies have found that purpose is unrelated to performance in specific cognitive domains (Cattaneo et al., 2022; Zahodne et al., 2018). More evidence with larger samples may help bring coherence to this literature. Studies that include performance across multiple domains within the same sample are particularly useful to determine whether the benefits of purpose are specific to specific domains of cognition or whether purpose is broadly beneficial.

In addition to cognitive performance, informant ratings of cognitive decline provide important information about cognitive function in daily life (American Psychiatric Association, DSM-5 Task Force, 2013; Mayo Clinic, 2019). For example, individuals may have deficits in daily life before such deficits can be detected on standardized tests (Jessen et al., 2020). Knowledgeable people familiar with the individual may be able to detect such deficits (Pérez-Blanco et al., 2022). Limited work, however, has examined whether purpose is associated with informant-rated cognitive function compared to research on objective performance. Purpose has been associated with less self-reported cognitive decline (Pluim et al., 2023; Wingo et al., 2020) and fewer self-reported cognitive failures (Sutin et al., 2023). The present research examines whether

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the association with perceived cognition extends to cognitive decline observed by close others.

Informants can also report on other aspects of the individual's everyday life relevant to cognitive health. Regular engagement in stimulating activities, for example, is critical for healthier cognitive aging (Verghese et al., 2003). Individuals higher in purpose in life tend to engage in such activities: Purpose is associated with more time spent volunteering (Nakamura et al., 2022), doing cognitively stimulating activities (Mei et al., 2020), and being physically active (Sutin et al., 2021b). Less is known about how purpose is associated with how individuals use their time in daily life, particularly as rated by a knowledgeable other. That is, to what extent are the behavioral patterns associated with purpose observable by other people in the individual's life? The present research addresses this question. It also addresses whether the patterns of association between purpose and self-reported emotional experience (i.e., more positive affect, less negative affect; Scheier et al., 2006) extend to expressions of emotions that can be observed by close others.

The association between purpose in life and cognition tends to be similar across sociodemographic groups (Boyle et al., 2010; Sunit et al., 2022). When a difference is detected across populations, it tends to be in degree rather than kind. That is, the association between purpose and cognition is apparent across groups but statistically stronger in one group compared to the other. For example, the association between purpose and cognitive decline over time is apparent across races but is stronger among Black than White adults (Kim et al., 2019). Studies with samples from specific populations, such as Black (Wagner et al., 2022) and Hispanic (Estrella et al., 2021) adults, also tend to find similar associations as studies with predominately White samples (Lewis et al., 2017). This evidence suggests that the association between purpose and healthier cognition may generalize across sociodemographic groups. Still, it is important to empirically evaluate generalizability. In addition to sociodemographic factors, it is also possible that other characteristics could modify the association. In particular, impaired cognitive status or depression may undermine the positive association between purpose and cognitive function because both of these factors are associated with purpose (Laird et al., 2019; Sutin et al., 2023) and impair performance on cognitive tasks (Henry et al., 2004; Semkowska et al., 2019).

Finally, other aspects of well-being may also be associated with cognitive function. Previous work has tested life satisfaction, optimism, positive affect, and mastery, as well as purpose, as predictors of incident dementia (Sutin et al., 2018). Other than purpose, these aspects of well-being generally did not have independent associations with dementia risk, particularly after accounting for symptoms of depression. Notably, purpose in life is conceptually and empirically distinct from depression (Ryff, 1989), and the independent association with dementia risk further suggests that, although the two constructs are related, they are distinct, particularly in relation to cognition. Still, life satisfaction (Zhu et al., 2022), optimism (Estrella et al., 2021), and positive affect (Castro-Schilo et al., 2019) have been associated with better cognitive function, and such associations may extend broadly across markers of cognitive health.

The present study examines the association between purpose in life and performance in five cognitive domains as well as overall cognitive function. It also addresses the relation between purpose and informant-rated cognitive decline and daily affect and activities. We expect purpose in life to be associated with better cognitive performance, less informant-rated cognitive decline, and more adaptive affective (more positive, less negative) and activity

(more cognitive and outside-the-home activities, fewer passive activities) profiles, as rated by a knowledgeable informant. We further test whether the relation between purpose and these outcomes is moderated by sociodemographic characteristics (e.g., are the associations similar in males and females?), cognitive impairment (e.g., do the associations differ among individuals who are impaired compared to unimpaired?), and depression (e.g., is purpose still relevant for cognition among individuals with depression?) to evaluate generalizability of the associations. Finally, we extend these associations to life satisfaction, optimism, positive affect, and mastery and test whether purpose and these aspects of well-being have associations with the cognitive and informant outcomes independent of each other and depressive symptoms. Based on previous work with dementia risk (Sutin et al., 2018), we expect purpose to have independent associations.

Method

Participants and procedure

Participants were from the Harmonized Cognition Assessment Protocol (HCAP), a sub-study of the Health and Retirement Study (HRS; Sonnega et al., 2014). The purpose of HCAP was to obtain detailed information on cognitive health with measures harmonized to optimize international comparisons (Langa et al., 2020). To be selected into HCAP, participants had to be at least 65 years old and complete the regular 2016 HRS assessment. Of the 5,500 eligible participants randomly selected to participate, 3,496 participants completed at least some part of the HCAP assessment. In addition to the cognitive assessment, target participants nominated one knowledgeable close other to report on their cognitive function and daily activities. Participants reported on their purpose in life as part of the Leave Behind Questionnaire in either 2014 or 2016. Participants were selected for the analytic sample if they had data available on their purpose and completed at least part of the HCAP assessment ($N = 2,812$). The analytic samples ranged from 2,542 to 2,812 in the individual analyses because of missing data on some variables. The Institutional Review Board at the University of Michigan provides oversight of the HRS, and all participants provide written informed consent before participating in each HRS assessment. The present analyses were based on de-identified public data and thus did not require Institutional Review Board oversight. This research was completed in accordance with Helsinki Declaration.

Compared with participants included in the analytic sample ($n = 2,812$), participants in HCAP without data to be included in the analytic sample ($n = 684$) were older ($d = .25, p < .001$), had fewer years of education ($d = .34, p < .001$), were more likely to be Black ($\chi^2 = 24.88, p < .001$) or a race other than white ($\chi^2 = 20.36, p < .001$) compared to white participants, and more likely to have Hispanic ethnicity ($\chi^2 = 39.54, p < .001$); there was no difference by sex ($\chi^2 = .50, p = .487$).

Measures

Purpose in life. Participants completed the purpose in life subscale from the Ryff Measures of Psychological Well-being (Ryff, 1989). Participants rated seven items (e.g., "I have a sense of direction and purpose in my life") on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*). Items were reverse scored when necessary and the mean was taken in the direction of greater purpose in life ($\alpha = .76$).

Cognitive performance. Detailed information about the selection of cognitive tasks and informant ratings, administration protocol, and scoring can be found in Weir and colleagues (2016). The cognitive tasks administered in HCAP were grouped into five domains (Sutin et al., 2020; Sutin et al., 2019): (1) *Episodic memory*, measured with the CERAD Word List Learning and Recall Task (immediate, delayed, recognition), the Wechsler Memory Scale Logical Memory I (immediate, delayed, recognition), and the Brave Man (immediate, delayed); (2) *Speed-attention*, measured with the Letter Cancellation Test, Backward Count, the Symbol-Digit Modalities Test, and Trails A and B; (3) *Visuospatial skills*, measured with CERAD Constructional Praxis and Raven's matrices; (4) *Language*, measured with animal fluency; (5) *Numeric Reasoning*, measured with the HRS Number Series. In addition to the five specific domains, global cognitive function was measured with the Mini-Mental State Examination (MMSE) (Folstein et al., 2001). All tasks were scored and standardized. The mean was taken across the standardized scores for the three domains measured with multiple tasks. Trails A and B were multiplied by -1 so the scoring would be in the same direction as the other measures in the speed-attention domain.

Informant-rated cognitive decline. Four standard informant-rated measures of cognitive decline were completed by one informant nominated by the participant who knew them well: the Informant Questionnaire on Cognitive Decline in the Elderly (Jorm, 1994), the Blessed Dementia Rating Scale Part 1 (Morris et al., 1989), the 1066 (Prince et al., 2011), and the Community Screening Instrument for Dementia (Hall et al., 2000). The four scales were scored, standardized, and the mean taken in the direction of greater informant-perceived cognitive decline.

Informant-rated affect and activities. Informants rated participants' recent affect and activities. Informants rated participants' positive (happy, engaged, alert, interested) and negative (confused, withdrawn) affect observed yesterday (or the most recent day they observed the participant most of the day) on a scale from 1 (*not at all*) to 5 (*very much*). Informants rated the time the participant spent on several activities in a typical day on a scale from 0 (*none*) to 5 (*7 hours or more*). A previous factor analysis found that the activities loaded on two factors (Sutin et al., 2021): Passive activities (watching TV, napping, chores [reverse scored]) and cognitive activities (reading, computer/internet). Informants further rated the frequency of activities outside the home (working/volunteering, going to the store, going for a walk, playing sports/exercising) on a scale from 1 (*daily*) to 6 (*never*). Items were reverse scored in the direction of more frequent activity. A previous factor analysis found that these activities loaded onto a single factor (Sutin et al., 2021).

Other aspects of well-being. Consistent with Sutin and colleagues (2018), four additional measures of well-being were considered: the Satisfaction with Life Scale (Diener et al., 1985), which measured an overall cognitive evaluation of one's life, the optimism subscale of the Life Orientation Test (Scheier et al., 1994), which measured a general orientation to expect good outcomes, positive affect measured with items from the Expanded Positive and Negative Affect Schedule (Watson et al., 1988), which measured the average positive emotions experienced in the last 30 days, and the Mastery scale (Lachman and Weaver, 1998), which measured participants' beliefs in their ability to accomplish their goals.

Sociodemographic covariates and moderators. For the cognitive performance outcomes, sociodemographic covariates were age in years, sex (0 = male, 1 = female), race (two dummy-coded

variables that compared 1 = Black and 1 = Otherwise identified to 0 = White), Hispanic ethnicity (0 = no, 1 = yes), education in years, and household income (in dollars log transformed). For informant-rated outcomes, covariates included participant sociodemographic factors and characteristics of the informant and their relationship: informant age in years, gender (0 = man, 1 = woman), years of education, whether the informant was the spouse (0 = no, 1 = yes), and the years the informant had known the participant. Cognitive impairment and depression were considered moderators. Cognitive impairment was defined as an MMSE score in the range of any impairment ($1 \leq 23$) versus no impairment ($0 \geq 24$). Depression was measured with an 8-item (yes/no) version of the CESD from the HRS assessment concurrent with purpose. Items were summed and classified into elevated distress ($1 \geq 3$ items endorsed) versus not elevated distress ($0 \leq 2$ items endorsed; Bergmans et al., 2019; Weissman et al., 1977).

Analytic strategy

Main effect of purpose. The association between purpose in life and the cognitive domains, global cognitive function, informant-rated cognitive decline, and informant-rated affect and activities was tested with linear regression. For the performance outcomes, each domain was regressed on purpose, controlling for age, sex, race, ethnicity, education, and income. For domains with multiple tasks, supplemental analyses tested the association with each individual task to determine whether a specific task was driving domain-level associations. We repeated the same strategy for the informant ratings of cognitive decline, affect, and activities. For these analyses, in addition to controlling for participant characteristics, we also controlled for informant and relationship characteristics. Across all analyses, the results were the same when year of the purpose assessment (2014 versus 2016) was included as a covariate. Since it did not impact the results, year of assessment was not included as a covariate.

Moderation. We examined whether the associations between purpose in life and cognitive performance and the informant ratings were moderated by age, sex, race, ethnicity, education, income, cognitive status, or depression by testing an interaction between purpose and each of these factors. Age, education, and income were tested as continuous variables; sex, race, ethnicity, cognitive status (defined by the MMSE threshold for impairment), and depression were tested as dichotomous variables that compared two groups as defined in the above section on covariates (e.g., male versus female for sex).

Other aspects of well-being. We tested the association between each of the additional four aspects of well-being and the cognitive and informant outcomes separately using the same strategy as for purpose. We then tested whether these associations were independent of each other and of depressive symptoms by including them simultaneously in the model.

All associations are reported with standardized beta coefficients, which can be interpreted as an effect size. As an additional measure of effect size, Cohen's *d* for the difference between participants in the top versus bottom quartile of purpose is also reported for the cognitive and informant-rated outcomes. P-values are reported to three decimal places to allow readers to make their own judgments about significance. For interpretation, we focus on values $< .01$ due to the large number of analyses.

Results

Descriptive statistics are in Table 1. Correlations among study variables are in Supplemental Table S1. In the present sample, purpose was associated negatively with age ($r = -.12, p < .001$) and positively with education ($r = .22, p < .001$) and income ($r = .19, p < .001$). Black participants had higher purpose than white participants ($d = .21, p < .001$); Hispanic participants had lower purpose than non-Hispanic participants ($d = -.26, p < .001$). There was no difference by sex ($d = .04, p = .290$) or between participants who had an otherwise identified race compared to white ($d = .09, p = .319$).

Main effect of purpose. Purpose in life was associated with better performance in all cognitive domains examined: Participants higher in purpose had better episodic memory, speed-attention, visuospatial ability, language, numeric reasoning, and higher global cognitive function than participants lower in purpose (Table 2). That is, participants with higher purpose were better able to remember words and stories, had faster reaction times and were more attentive, were able to visually manipulate shapes more easily, retrieved more animals in 60 seconds, were able to reason better with numbers in their heads, and overall had better cognitive function. Purpose was associated with better performance on all the individual cognitive tasks (Supplemental Tables S2-S4), except for the Logical Memory recognition task (Supplemental Table S2). The associations between purpose and the specific cognitive tasks across domains were generally similar in terms of strength (β range .03-.12; median $\beta = .08$ across the individual tasks), and there was not a clear pattern that purpose was associated with better performance on any specific task or, by extension, any specific domain.

Purpose was associated with informant-rated cognitive decline, affect, and activities (Table 3): Participants with more purpose were rated by their knowledgeable informant as having less cognitive decline, more positive and less negative affect on a recent day, greater engagement in cognitive activities, less engagement in passive activities, and more activities outside the home. The associations between purpose and the individual tests (for informant-rated cognitive decline) and items (for informant-rated affect and activities) were largely consistent with purpose and the aggregate scores (Supplemental Tables S5-S8).

Moderation. None of the interactions between purpose and the possible moderators on cognitive performance was significant (Supplemental Table S9), which indicated similar associations across age, sex, race, ethnicity, education, income and impairment, and depression status. The one exception was overall cognitive function: The association between purpose and global cognitive function was moderated by age, race, education, and income: The association was apparent across these groups but was stronger among relatively older compared to relatively younger participants ($\beta_{\text{purpose} \times \text{age}} = .05, p = .004$), Black compared to White participants ($\beta_{\text{purpose} \times \text{race}} = .05, p = .008$), and participants with relatively lower education or income compared to relatively higher education or income ($\beta_{\text{purpose} \times \text{education}} = -.10, p < .001$ and $\beta_{\text{purpose} \times \text{income}} = -.07, p < .001$).

There was also little evidence of moderation for the informant-rated outcomes (Supplemental Table S10). Only two interactions were significant: purpose was associated with less informant-rated cognitive decline across education, but it was stronger among participants with relatively lower education ($\beta_{\text{purpose} \times \text{education}} = .05, p = .009$), and purpose was associated with more cognitive activities across race, but the association was stronger among Black

Table 1. Descriptive statistics for all study variables

Variable	Mean (SD) or % (n)
Participant characteristics	
Age (years)	76.42 (7.31)
Sex (female)	59.6% (1677)
Race (Black)	14.7% (414)
Race (Other)	4.4% (123)
Race (White)	80.9% (2275)
Hispanic (yes)	9.3% (262)
Education (years)	12.92 (3.00)
Income (log transformed)	10.51 (1.12)
Informant characteristics	
Age (years)	64.84 (14.05)
Gender (women)	66.8% (1712)
Education (years)	13.53 (2.61)
Relationship characteristics	
Spouse (yes)	47.1 (1206)
Years known (years)	30.10 (21.26)
Purpose in life	4.54 (.92)
Cognitive performance	
Episodic memory	-.01 (.74) ^a
Speed-attention	-.06 (.86) ^a
Visuospatial ability	-.01 (.84) ^a
Language	16.49 (6.39)
Numeric reasoning	523.75 (30.62)
Global cognitive function	27.10 (3.29)
Informant ratings	
Cognitive decline	.00 (.88) ^a
Positive affect	3.92 (.76)
Negative affect	1.37 (.61)
Passive activities	2.49 (.87)
Cognitive activities	2.02 (1.12)
Outside activities	3.35 (1.16)
Depressive symptoms	1.24 (1.81)
Depression status ^b	17.4% (490)
Cognitive status ^c	10.1% (285)
Well-being measures	
Life satisfaction	5.11 (1.46)
Optimism	4.56 (1.13)
Positive affect	3.57 (.78)
Mastery	4.70 (1.13)

Ns range from 2,445 to 2,812 due to missing data.

^aScore is a composite of multiple tasks that were standardized before aggregating.

^bPercent of participants with elevated depressive symptoms (≥ 3 items endorsed on the 8-item CESD).

^cPercent of participants who scored in the range of any impairment on the Mini Mental State Examination (≤ 23).

participants ($\beta_{\text{purpose} \times \text{race}} = .05, p = .004$). None of the other interactions was significant.

Other aspects of well-being. The four other aspects of well-being examined (life satisfaction, optimism, positive affect, mastery) were associated with better cognitive function in the individual domains and global cognitive function (except mastery with episodic memory and optimism with numeric reasoning and cognitive function) (Table 4). Depressive symptoms were associated with worse cognitive function. Most of these associations, however, were reduced to non-significance when entered simultaneously with each other, depressive symptoms, and purpose in life. Purpose remained a significant predictor of episodic memory, visuospatial ability, and global cognitive function. Similarly, these aspects of well-being were associated with informant-rated cognition, affect, and activities (except for optimism and mastery with cognitive activities) (Table 5). Again, most associations were reduced to non-significance when entered simultaneously with each other and purpose in life (except depressive symptoms). Satisfaction with life and positive affect remained significant predictors of informant-rated positive and negative affect; positive affect was also associated with greater

Table 2. Associations between purpose in life and domains of cognitive function

Predictor	Episodic Memory		Speed-attention		Visuospatial ability		Language		Numeric reasoning		Global cognitive function	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
Age	-.33	< .001	-.39	< .001	-.28	< .001	-.27	< .001	-.18	< .001	-.24	< .001
Sex	.20	< .001	.08	< .001	-.01	.602	.03	.076	-.08	< .001	.12	< .001
Race (Black)	-.12	< .001	-.24	< .001	-.26	< .001	-.17	< .001	-.24	< .001	-.16	< .001
Race (otherwise ident)	-.04	.021	-.03	.034	-.05	.005	-.04	.013	-.08	< .001	-.06	.002
Ethnicity	-.06	.002	-.08	< .001	-.03	.060	.02	.422	-.10	< .001	-.01	.622
Education	.24	< .001	.30	< .001	.31	< .001	.23	< .001	.31	< .001	.28	< .001
Income	.12	< .001	.10	< .001	.08	< .001	.10	< .001	.12	< .001	.05	< .001
Purpose in life	.09	< .001	.12	< .001	.11	< .001	.09	< .001	.08	< .001	.12	< .001
Sample size	2812		2803		2803		2811		2445		2812	
Cohen's <i>d</i>	.52		.64		.58		.52		.46		.54	

Coefficients are standardized beta coefficients from linear regression. Cohen's *d* compares participants in the top versus bottom quartile of purpose in life.

Table 3. Associations between purpose in life and informant-rated cognitive decline, affect, and activities

Predictor	Cognitive decline		Positive affect		Negative affect		Passive activities		Cognitive activities		Activities outside the house	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
Age	.27	< .001	-.06	.004	.10	< .001	.20	< .001	-.20	< .001	-.20	< .001
Sex	-.02	.334	.08	< .001	-.03	.156	-.15	< .001	.03	.142	-.08	< .001
Race (Black)	-.02	.355	.04	.069	-.02	.302	.15	< .001	-.06	.001	-.03	.133
Race (otherwise ident)	.00	.838	-.05	.017	.04	.091	.01	.530	-.02	.370	-.02	.394
Ethnicity	-.01	.529	-.01	.675	.02	.262	-.04	.061	-.06	.003	.09	< .001
Education	-.05	.032	.07	.004	-.04	.106	-.02	.307	.26	< .001	.11	< .001
Income	-.10	< .001	.09	< .001	-.09	< .001	-.08	< .001	.06	.005	.11	< .001
Informant age	-.10	< .001	.01	.579	-.03	.239	-.08	.003	.04	.125	.09	< .001
Informant gender	.05	.029	.08	< .001	-.04	.065	.00	.831	-.01	.595	-.05	.022
Informant education	.05	.037	.05	.018	-.04	.069	.01	.755	.06	.006	.05	.036
Spouse	.14	< .001	-.05	.078	.06	.075	.10	< .001	-.03	.382	-.18	< .001
Years known	-.03	.346	-.01	.676	-.05	.063	-.01	.724	-.01	.764	.01	.598
Purpose in life	-.17	< .001	.22	< .001	-.15	< .001	-.21	< .001	.07	< .001	.19	< .001
Sample size	2563		2563		2562		2547		2542		2562	
Cohen's <i>d</i>	-.53		.66		-.49		-.58		.44		.66	

Coefficients are standardized beta coefficients from linear regression. Cohen's *d* compares participants in the top versus bottom quartile of purpose in life.

Table 4. Associations between other aspects of well-being and domains of cognitive function

Well-being measure	Episodic memory		Speed-attention		Visuospatial ability		Language		Numeric reasoning		Global cognitive function	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
	Entered Individually											
Satisfaction with life	.06	< .001	.10	< .001	.09	< .001	.06	< .001	.08	< .001	.05	.004
Optimism	.05	.002	.06	< .001	.05	.001	.06	< .001	.04	.038	.04	.025
Positive affect	.08	< .001	.13	< .001	.09	< .001	.10	< .001	.06	< .001	.10	< .001
Mastery	.04	.019	.11	< .001	.08	< .001	.05	.002	.04	.011	.07	< .001
Depressive symptoms	-.06	< .001	-.09	< .001	-.07	< .001	-.06	< .001	-.09	< .001	-.06	< .001
	Entered Simultaneously											
Purpose in life	.06	.006	.04	.019	.06	.003	.04	.083	.05	.020	.08	< .001
Satisfaction with life	.01	.501	.03	.147	.04	.018	.01	.622	.04	.051	.00	.857
Optimism	.01	.555	-.02	.386	-.01	.599	.02	.382	-.01	.569	-.02	.371
Positive affect	.04	.079	.07	< .001	.02	.272	.06	.007	.00	.909	.05	.025
Mastery	-.02	.311	.06	< .001	.03	.059	.00	.907	.00	.991	.02	.316
Depressive Symptoms	-.03	.079	-.03	.113	-.02	.386	-.02	.373	-.05	.008	-.02	.389

Coefficients are standardized beta coefficients from linear regression, controlling sociodemographic covariates. Multicollinearity metrics indicated that multicollinearity was not problematic (variance inflation factors < 2, tolerances > .5).

engagement in activities outside the house. Purpose in life remained a significant predictor of all informant-rated outcomes, except cognitive activities.

Finally, note that if a more stringent *p*-value was used due to the large number of tests (e.g., *p* < .001), all associations between

purpose in life and the cognitive outcomes reported in Tables 2, 3 would remain significant. When entered simultaneously with the other measures of well-being (Tables 4, 5), the associations between purpose and informant-rated cognition, affect, and activities would remain significant, although only the association

Table 5. Associations between other aspects of well-being and informant-rated cognitive decline, affect, and activities

Well-being measure	Cognitive decline		Positive affect		Negative affect		Passive activities		Cognitive activities		Activities outside the house	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
	Entered Individually											
Satisfaction with life	-.10	< .001	.19	< .001	-.15	< .001	-.12	< .001	.05	.011	.16	< .001
Optimism	-.08	< .001	.11	< .001	-.09	< .001	-.08	< .001	.03	.087	.12	< .001
Positive affect	-.15	< .001	.24	< .001	-.19	< .001	-.18	< .001	.07	< .001	.20	< .001
Mastery	-.13	< .001	.15	< .001	-.12	< .001	-.12	< .001	.04	.018	.13	< .001
Depressive symptoms	.18	< .001	-.25	< .001	.22	< .001	.20	< .001	-.05	.007	-.20	< .001
	Entered Simultaneously											
Purpose in life	-.10	< .001	.09	< .001	-.03	.197	-.14	< .001	.04	.121	.08	< .001
Satisfaction with life	.00	.963	.07	.004	-.06	.007	-.03	.207	.02	.518	.05	.019
Optimism	.02	.434	-.03	.208	.02	.479	.03	.145	-.01	.693	.01	.588
Positive affect	-.03	.276	.11	< .001	-.08	.003	-.06	.020	.03	.192	.07	.004
Mastery	-.05	.015	.02	.287	-.02	.422	-.01	.585	.00	.824	.02	.283
Depressive symptoms	.14	< .001	-.17	< .001	.17	< .001	.12	< .001	-.03	.230	-.12	< .001

Coefficients are standardized beta coefficients from linear regression. Each aspect of well-being was entered in the regressions separately.

with global cognitive function would remain significant among the cognitive domains. In addition, only the interactions between purpose and education and income on global cognitive function would remain significant.

Discussion

The present research examined the association between purpose in life and a range of cognitive outcomes that spanned performance across multiple domains to informant observations of cognitive decline, affective experience, and frequency of activities inside and outside the home. Overall, the findings suggested consistent associations between purpose in life and better cognitive function across domains. Further, informants observed that participants with higher purpose had both maintained their cognitive function and engaged in activities that may help support cognitive health over time. Finally, although other aspects of well-being were associated with the cognitive and informant-rated outcomes, most did not remain significant controlling for each other and depressive symptoms.

Previous research has found consistent associations between purpose in life and cognitive status, episodic memory, and verbal fluency (Boyle et al., 2010; Sutin et al., 2022; Windsor et al., 2015). The association between purpose and other cognitive domains has been more inconsistent, with some studies finding positive associations (Estrella et al., 2021; Wagner et al., 2022) and other studies finding no relation (Cattaneo et al., 2022; Zahodne et al., 2018). The present study found that purpose was associated with better performance in every domain measured, as well as global cognitive function. The inconsistency in the literature may be due, in part, to power: Studies with larger samples (including the current study) tend to find positive associations with purpose, whereas studies with smaller sample sizes tend to find null associations. Further, the association was similar across domains, which suggests that purpose does not have differential associations with better function in a specific domain but rather is associated broadly with better cognitive function.

Informant ratings of cognitive function are critical to the diagnosis of dementia (American Psychiatric Association, DSM-5 Task Force, 2013; Mayo Clinic, 2019). These ratings provide key information about cognitive function in everyday life that may not be detected on standardized cognitive tests and/or that the individual may not be able to report about themselves. The present

findings suggest consistency between cognitive performance and cognitive function observed in daily life. That is, participants with more purpose performed better on the cognitive tasks in the lab, and knowledgeable informants observed that participants also functioned well cognitively in daily life. Much like the better performance across multiple cognitive domains, the association with informant-rated cognition indicates consistent associations between purpose and better cognition in daily life, as observed by close others.

The present research also indicated that purpose is associated with beneficial affective and activity profiles that are observable by close others. Individuals higher in purpose in life tend to experience more positive affect and less negative affect (Scheier et al., 2006). These affective experiences are observable and were detected by informants. Purpose in life also tends to be associated with greater engagement in activities beneficial for brain health, such as volunteering (Nakamura et al., 2022) and cognitively stimulating activities (Mei et al., 2020). Again, engagement in these activities is observable by close others and indicates that there is an association beyond the shared variance of self-report. These more beneficial profiles may help support the maintenance of cognitive health over time.

The association between purpose and two items rated by observers are of particular note. First, purpose in life was associated with less informant-rated observations of feeling withdrawn, one of the two items that measured negative affect. It is worth noting this association because it is a behavioral marker of loneliness (Heinrich & Gullone, 2006). Observers do not necessarily know the internal feelings of the people close to them, but they can observe behavior and withdrawn behavior can indicate loneliness. This association is worth noting because of the consistent association between purpose in life and fewer self-reported feelings of loneliness (Sutin et al., 2022). The negative association with withdrawn conceptually replicates this association with a behavioral marker of loneliness observed by others. Given that loneliness is associated with cognitive outcomes (Luchetti et al., 2020), it may be one mechanism in the pathway between purpose and cognitive health.

Second, there was also an association between self-reported purpose and observer rated physical activity. Again, this association is not surprising given that many studies have found that purpose is associated with greater physical activity measured with both self-report (Sutin et al., 2021b; Yemiscigil & Vlaev, 2021)

and objectively with accelerometry (Hooker & Masters, 2016; Sutin et al., 2021a). The present finding indicates that individuals higher in purpose engage in physical activity regularly enough that it is detected by observers. Given that physical activity is associated consistently with better cognitive outcomes (Erickson et al., 2019), similar to loneliness, it may be one mechanism between purpose and cognitive health.

Purpose in life has been hypothesized to contribute to better health outcomes, in part, through greater engagement (McKnight & Kashdan, 2009). Engagement can be defined in many ways, and often includes better attention (Allan Cheyne et al., 2009), more positive affect (Bakker, 2011), and more frequent cognitively stimulating activities (Phillips, 2017). Although there was no pattern that these factors were more associated with purpose than the other measures (i.e., the associations were similar across the broad range of factors measured), purpose was associated with these aspects of engagement. These findings provide empirical evidence that individuals higher in purpose have greater engagement in daily life, as measured by objective cognitive tasks and informant observations, which reduces the shared variance of self-report.

The moderation analysis indicated that the association between purpose and cognitive performance and the informant ratings of cognition, affect, and activities generalized across socio-demographic groups. There was little evidence of moderation, and when apparent, the positive association was stronger in groups (older, Black, and low education) that tend to be at greater risk for poor cognitive outcomes. This finding fits with other evidence for this pattern (Kim et al., 2019; Sutin et al., 2022). Still, the moderation in the current study should be interpreted with caution because interactions are difficult to replicate (Sherman & Pashler, 2019) and the number of interactions tested. More broadly, however, the limited evidence of moderation speaks to the generalizability of the positive association between purpose and cognitive-related outcomes.

The associations also generalized across measures of well-being: Similar patterns with cognitive performance and informant-rated cognition, affect, and activities were apparent across life satisfaction, optimism, positive affect, and mastery. These associations are consistent with previous research that found life satisfaction (Zhu et al., 2022), optimism (Estrella et al., 2021), and positive affect (Castro-Schilo et al., 2019) to be associated with better cognitive function. Also consistent with previous research (Sutin et al., 2018), purpose had independent associations with most outcomes. In contrast, life satisfaction, optimism, positive affect, and mastery had few independent associations. This pattern may reflect shared variance of well-being associated with the cognitive outcomes. Because of this shared variance, the predictive power was diminished when the well-being measures were included together. Purpose in life may have an additional engagement component that does not share as much variance with the other well-being factors to retain its association with cognition. Likewise, although purpose was correlated with depressive symptoms in this sample, the relatively modest correlation and the independent associations with the performance and informant outcomes suggest that purpose is not simply a component of depression.

The present research had several strengths, including the large sample, measurement of objective cognitive performance in five domains, and informant ratings of cognitive decline, affect, and activities. There are also some limitations. First, there was only one assessment of cognition, and thus it was not possible to examine

whether purpose was associated with change in cognitive performance. Second, the data were observational and thus it was not possible to evaluate directionality or causality. Future research could take an experimental approach to determine causality. Third, while we found similar associations across the cognitive domains tested, it is possible that the associations could differ with other cognitive tasks not included in HCAP. Fourth, although the sample was fairly diverse in terms of race, ethnicity, and education, participants were living in the United States. The HRS is a nationally representative sample of adults 50 and over living in the United States (Sonnegg et al., 2014). Generalizability might be limited for specific groups not well sampled in the HRS (e.g., Asian Americans) or to populations outside the United States. Note, though, that previous research has found similar associations between purpose and episodic memory and verbal fluency across socioeconomically and geographically diverse countries (Sutin et al., 2022). Future research is still needed to better evaluate generalizability of the associations among all domains and informant-rated cognition, affect, and activities across populations and cultures.

Despite these limitations, the present research supports the literature on purpose and cognitive function and indicates consistent associations between purpose and healthier patterns of cognition and behavior in everyday life. To the extent that purpose is malleable and can be increased through intervention (Park et al., 2019), it is a promising target for intervention for maintaining cognitive health in older adulthood. Future research could take an experimental approach to evaluate the causal, mechanistic linkage between purpose and cognitive health.

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