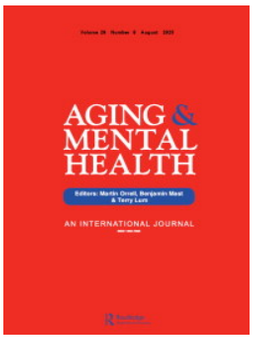

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Loneliness and subjective cognitive concerns in daily life

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ABSTRACT

Objectives: Loneliness is a risk factor for dementia, but its relationship with subjective cognitive concerns in daily life remains underexplored. This study investigates how loneliness relates to self-perceived cognitive function in everyday contexts.

Method: Data from 1,828 adults (M_{age} = 56.56; 55.7% female) in the National Study of Daily Experiences were analyzed. Respondents completed 8 days of daily assessments on loneliness, cognitive concerns (e.g. memory lapses), and other aspects of daily life. Multilevel linear and binary logistic regressions were used.

Results: The analysis indicated a significant between- and within-person association between loneliness and subjective cognition. At the between-person level, participants who felt lonelier tended to report more cognitive problems. At the within-person level, on days participants felt lonely (independent of the frequency of those feelings), they also reported more trouble concentrating and were more likely to experience memory lapses. Feeling lonely was also linked to irritation and interference related to memory lapses. In general, the associations remained significant controlling for demographic and socio-contextual factors and excluding individuals with anxiety/depression or neurodegenerative conditions.

Conclusion: Results suggest that even transitory feelings of loneliness are associated with poor perceptions of everyday cognitive function, a marker with implications for future risk of cognitive decline.

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KEYWORDS
Daily diary; loneliness; memory lapses; middle-aged and older adults; subjective cognitive concerns

Loneliness is a negative subjective feeling that arises from unmet social needs that has widespread, well-documented consequences for well-being and health (Hawkley & Cacioppo, 2010; National Academies of Sciences, Engineering, and Medicine, 2020). For example, feeling lonely is associated with cardiovascular and immune dysfunctions (Shiovitz-Ezra & Parag, 2019; Steptoe et al., 2004), impaired sleep (Griffin et al., 2020), depression (Cacioppo et al., 2010; Lee et al., 2021), and even premature death (Wang et al., 2023). Feeling lonely is not the same as being alone or isolated and its impact on health goes beyond the availability of social relationships (Hawkley & Cacioppo, 2010). There is mounting evidence that loneliness is also associated with cognitive health (see Cacioppo & Hawkley, 2009 and Ren et al., 2023 for reviews), with recent meta-analyses linking feeling lonely to increased risk of incident dementia and cognitive impairment (Luchetti et al., 2024) and poor cognitive performance across multiple domains (episodic memory, speed attention, visuo-spatial ability, numeric reasoning, and verbal fluency; Lee et al., 2025). These associations, however, may vary across studies depending on the sample composition, cognitive outcome examined, and statistical control for relevant psychosocial and health-related covariates. Notably less explored in this literature is the association between loneliness and subjective cognitive concerns—a symptom that might precede objective cognitive impairment (Jessen et al., 2023; Liew, 2020).

Subjective reports of memory or cognitive problems are common across the adult lifespan, particularly among middle-aged and older adults (Ginó et al., 2010; Mogle et al., 2019, 2023). Although such reports are only moderately correlated with performance on standardized cognitive tests (e.g. Crumley et al., 2014), poor perceptions of cognition can reflect subtle cognitive changes in some individuals (e.g. Schultz et al., 2015). Several studies, indeed, have found subjective cognitive complaints and/or concerns to increase the risk for subsequent cognitive decline and impairment (Hertzog et al., 2018; Kang et al., 2024; Liew, 2020). It is thus important to examine what factors are associated with subjective evaluations of cognitive function, before the onset of objective cognitive impairment. In a community-based registry sample, Reynolds et al. (2022) found self-reported cognitive decline to be associated with well-known psychosocial risk factors for dementia, including loneliness and emotional instability (see e.g. Aschwanden et al., 2020). Similarly, in other survey-based studies, feelings of loneliness have been associated with self-report cognitive measures, such as the Cognitive Failure Questionnaire (e.g. Sanprakhon et al., 2024; see also Pecchinenda et al., 2024 and Pluim et al., 2023). While these studies provide evidence for an association between loneliness and subjective cognitive measures, they treat both variables as stable, individual difference variables. In fact,

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perceptions of loneliness and cognitive abilities can fluctuate within individuals, even over the course of weeks or days.

According to empirical evidence and theories of loneliness and health (Cacioppo & Hawkley, 2009; Hawkley & Cacioppo, 2010; Zhong et al., 2016), even transient feelings of loneliness pose risk for cognitive health in aging adults (Kang et al., 2024; Kim & Hwang, 2024). As theorized by Cacioppo and colleagues (Hawkley & Cacioppo, 2010), lonely individuals tend to be hypervigilant to social threats and anticipate negative social interactions, with subsequent withdrawal from social situations. This process is hypothesized to activate psycho-physiological reactions (e.g. heightened stress responses) and behavioral responses (e.g. hostility/aggression in response to threats) that, if not resolved with social reaffiliation, have consequences for health, social functioning, and well-being (Cacioppo & Hawkley, 2009; Hawkley & Cacioppo, 2010). In line with this theorization and the attention-depletion hypothesis (see e.g. Sliwinski et al., 2006), feeling lonely may represent a stressor that limits attentional resources to function in daily life. For example, in daily diary studies, day to day (or momentary) fluctuations in loneliness have been associated with higher levels of psychopathological symptoms such as stress, anxiety, and depression (e.g. Buecker et al., 2024; Kang et al., 2024; Van Bogart et al., 2023), emotional hypervigilance (Meng et al., 2020) and strain in daily social interactions (Nikitin & Freund, 2018; Zhaoyang et al., 2022)—all aspects that may disrupt daily routines, including daily tasks that relay on memory and cognitive function (Stuart et al., 2024; Zhaoyang et al., 2021). Daily fluctuations in affect, and in particular loneliness, may thus relate to subjective cognitive concerns or problems. For example, experiences of memory lapses have been associated with daily affective responses: Mogle et al. (2019) found that on days in which participants reported a memory lapse (i.e. forgetting to do something), they experienced higher negative affect and lower positive affect. To our knowledge, no published study (except for a conference abstract, see Van Bogart et al., 2024) has examined the relation between loneliness and subjective cognition in everyday life.

The current study extends prior work by examining the association between daily loneliness and subjective cognitive concerns. To examine this association, we leverage a daily diary design from the National Study of Daily Experiences (NSDE), which is part of the Midlife in the United States (MIDUS) study of well-being and health (Radler, 2014). Daily diary designs, like the NSDE, help minimize retrospective recall biases and enable the examination of micro-level (within-person) processes in participants' everyday environments. Based on evidence that links loneliness to cognitive functioning at the between-person level (Lee et al., 2025; Reynolds et al., 2022), we expect to find a significant, within-person association between daily loneliness and subjective cognitive concerns. Specifically, we expect that on days in which participants report feeling lonelier, they will also report more cognitive problems. When evaluating this association, we account for relevant individual-level (social disengagement, depressive/negative affect and health problems; Ren et al., 2023) and socio-contextual factors (e.g. daily stressors, such as having a disagreement with someone) that are related to loneliness and may affect subjective cognition in daily life (e.g. Jang et al., 2024). While prior studies focused primarily on older adults, the current study makes use of a sample with a wide age range that allows examination of whether the association between daily loneliness and subjective cognition is moderated by age and how it may differ across different age groups. Exploratory analyses also test whether the association vary by sex, race, education, and marital status, to assess generalizability across socio-demographic groups.

Methods

Sample and procedure

Data were from the NSDE study, part of the MIDUS (Radler, 2014). The current analysis included a subsample of the MIDUS Refresher (MR) and MIDUS 3 (M3) that participated in the NSDE. Details on eligibility and sample size can be found at https://midus.wisc.edu/. Respondents completed 15–20 min telephone interviews every day for 8 consecutive days in 2012–2014 (MR) or 2017–2019 (M3). Interviews were conducted in the afternoon/evening and included questions on loneliness and subjective cognitive concerns (e.g. memory lapses) experienced since about the same time as the previous day.

The analytic sample consists of 1828 respondents (M_{age} = 56.56, range 25–90 years, 55.7% females; 759 from MR and 1069 from M3) who had at least two daily interviews with data on loneliness, cognitive concerns, and basic covariates (age, sex, race, education, and marital status). These respondents completed on average 7.78 daily interviews (range 2–8), with 13,794 observations (out of 14,624 possible) for loneliness and cognitive concerns. Additional demographics for the sample are in Table 1.

Table 1. Descriptive statistics.

	Mean (SD) or *N* (%)	ICC
Age	56.56 (13.46)	
Female	1018 (55.7)	
Non-white	267 (14.6)	
Education		
Less than high school	60 (3.3)	
High school or equivalent	338 (18.5)	
Some college but no degree	554 (30.3)	
College degree	439 (24.0)	
Some graduate school or higher	437 (23.9)	
Married/with partner	1309 (71.6)	
Social disengagement (range 0–4)	1.56 (1.01)	
Depressive/negative affect (range 1–5)	1.51 (0.55)	
Any chronic health problems	1,392 (76.1)	
Daily Variables		
Loneliness		
Any loneliness	473 (25.9)	.24
Mean level (range 0–4)	0.15 (0.41)	.58
Subjective Cognition		
Trouble concentrating (range 0–4)	0.42 (0.49)	.38
Memory Lapses		
Any lapses	1,544 (84.5)	.27
Number of lapses (range 0–9)	0.71 (0.79)	.45
Irritation (range 1–10)	2.70 (1.70)	.41
Interference (range 1–10)	1.50 (0.91)	.29
Any argument/disagreement	740 (40.5)	.06
Any other negative/stressful event	1577 (86.3)	.15
Closeness to others (range 0–4)	2.66 (0.85)	.62
Sense of belonging (range 0–4)	2.99 (0.79)	.63

About 41.5% (n = 759) was from MR and 58.5% (n = 1069) from M3. For day-level variables, we reported means (and SD) or percentages of participants experiencing an event (e.g. memory lapses) at least one time across the study period. Sensitivity analyses excluded: (a) individuals with anxiety and/or depressive disorder (n = 218); and (b) individuals with a diagnosis of neurodegenerative disorder (n = 162).

Measures

Daily loneliness

Daily loneliness was assessed with a single-item question, 'How much of the time today did you feel lonely?', with responses from 0 (*none of the time*) to 4 (*all of the time*). Similar single-item indicators are commonly used to capture loneliness experiences in daily life (Halvorson & Kuczynski, 2024). The intraclass correlation coefficient (ICC = 0.58) indicated that 58% of the variance in loneliness was attributable to between-person differences and 42% (1- ICC) was attributable to within-person variability. Because participants did not experience loneliness in most daily assessments (i.e. reported scores of 0), daily loneliness was operationalized as a binary predictor (any loneliness during the day, yes/no), as well as a frequency scale.

Daily subjective cognition

Daily subjective cognition was assessed with two measures. The first measure was a single-item question, 'Today, how often did you have trouble concentrating?', with responses ranging from 0 (*none of the time*) to 4 (*all of the time*). This item is included in the Quality of Life in Neurological Disorders-Cognitive Function short form scale and has been used in other ecological/daily assessment studies (e.g. Munsell et al., 2024). The second measure was the Daily Memory Lapses checklist (Mogle et al., 2019, 2023). Participants reported on prospective memory lapses: whether they forgot about errands/chores, taking medications, finishing activities, attending events and reasons for entering a room; and retrospective memory lapses: whether they forgot names, where something was put, words and information. Those who endorsed any of the items were coded as having experienced memory lapses since the previous day (1 = yes, 0 = no). Participants also indicated how much they were irritated by their lapses ('How much does forgetting [prospective or retrospective lapses] bother you now?'; range = 1 [not at all] – 10 [very much]) and the interference with daily routine ('How much did forgetting [prospective or retrospective lapses] interfere with your schedule?'; range = 1 [not at all]–10 [very much]). A total irritation score and a total interference score were computed across the lapses.

Covariates

In line with other NSDE studies (e.g. Miller et al., 2023) and studies on loneliness and cognition (e.g. Lee et al., 2025), relevant socio-demographic covariates included age (years), sex (1 = female, 0 = male), racial origins (1 = non-white, 0 = white), education level (1 = less than high school degree; 2 = high school degree/general equivalency diploma [GED]; 3 = some college; 4 = college degree; 5 = some graduate school or higher education), and marital status (1 = married or cohabitating with a partner; 0 = not married, nor cohabitating). Additional individual-level covariates included an index of social disengagement, depressive/negative affect, and presence/absence of chronic health problems. The index of social disengagement (Stokes et al., 2021) included whether the respondents had less than monthly contacts with children or no children (yes/no); whether they had less than monthly contacts with family members, friends, and/or neighbors (yes/no); whether they attended church/temple less than once a month (yes/no); and whether they participated in sports or social groups (yes/no). These components were summed (range 0–4), with higher scores indicating higher social disengagement. Depressive/negative affect was measured with 6 items derived from the Center for Epidemiologic Studies Depression Scale (CES-D) and 5 negative adjectives from the Positive and Negative Affect Schedule, part of the self-administered questionnaire of the regular MIDUS assessment (University of Wisconsin, Institute on Aging, 2018). Responses to the items (e.g. 'During the past 30 days, how much of the time did you feel… so sad nothing could cheer you up?') were on a 5-point scale from 1 (*all the time*) to 5 (*none of the time*). Responses were reverse-scored and the mean taken across the items (excluding the CES-D item on loneliness); higher scores indicated higher depressive/negative affect. The presence/absence of health problems was assessed using a checklist where participants reported any chronic conditions (e.g. diabetes, hypertension, etc.) experienced in the past 12 months (University of Wisconsin, Institute on Aging, 2018); if participants checked one or more of the conditions, they were classified as having a chronic condition (1= yes, 0 = no). These individual-level covariates were included in the analysis because they are considered confounders or potential mediators of the association between loneliness and cognitive function (see Lee et al., 2025; Ren et al., 2023). Additional analysis further controlled for day-level social and contextual covariates: whether participants had an argument or disagreement with someone since the last daily assessment (yes/no); whether they experienced any other negative/stressful event (yes/no); and whether they felt 'close to others' and 'like [they] belong' from 0 (*none of the time*) to 4 (*all of the time*) since the previous day. These items were included in the analyses to control for aspects of daily life related to loneliness that could affect subjective cognitive function (e.g. Jang et al., 2024). To test the robustness of results, sensitivity analysis excluded (a) participants who met the criteria for an anxiety and/or depressive disorder based on the World Health Organization Composite International Diagnostic Interview-Short Form (Kessler et al., 1998; see also study documentation, University of Wisconsin, Institute on Aging, 2018), and (b) those who reported a doctor diagnosis of a neurodegenerative disorder (stroke, traumatic brain injury, Parkinson's disease or any other neurodegenerative disorders), which are more prone to report cognitive problems or concerns.

Analysis

Multilevel linear or binary logistic regression models were used to account for the nested data structure, i.e. daily assessments (Level 1) nested within individuals (Level 2), and type of outcome: scale versus binary outcome, respectively. The outcomes of interest were daily trouble concentrating; memory lapses; and irritation and interference for those who reported memory lapses. For each outcome, we fitted a series of models: Model 1 included a person-mean-centered score of daily loneliness as a predictor of the outcome. This score was calculated as each daily score of loneliness minus the mean of loneliness across daily assessments for each participant, which reflected participants' deviations from their mean level of loneliness across the daily assessments (i.e. within-person variation). Model 1.1 further accounted for the average loneliness (between-person) level derived across daily assessments. Model 2 extended Model 1 to account for individual-level factors such as age, sex, race, education, and marital status. Model 2.1 additionally accounted for social disengagement, Model 2.2 included depressive/negative affect, and Model 2.3 included the presence/absence of chronic health problems. Model 3 included

day-level social and contextual factors. Additional analysis controlled for subsample (MR = 1; M3 = 0) to account for potential differences between M3 and MR; when including this covariate, the results were virtually the same and thus were not reported below. All models were run twice: Once with loneliness as a continuous variable and once with loneliness as a dichotomous variable (felt lonely during the day, yes/no). The models used maximum likelihood estimation to handle missing data. Sensitivity analyses were conducted excluding: (a) individuals with anxiety and/or depression ($n = 218$); and (b) any type of neurodegenerative disorder ($n = 162$). Exploratory analyses examined whether the associations between daily loneliness and subjective cognition varied by age and other socio-demographic factors (sex, race, education, and marital status). All analyses were performed in SPSS (version 29).

Results

Descriptive statistics for study variables are in Table 1. Table 2 reports the association between loneliness and trouble concentrating. As expected, in the basic model (Model 1), loneliness was associated with poorer concentration, when operationalized as either a frequency scale ($B = 0.16$, SE = 0.015, $p < .001$) or a binary predictor ($B = 0.29$, SE = 0.022, $p < .001$). That is, on days when participants felt lonely (or lonelier than their mean-level across assessments), they reported more trouble concentrating. In addition to this daily association, those who had higher mean-level loneliness scale across the 8 days reported poor daily concentration ($B = 0.37$, SE = 0.026, $p < .001$; Supplementary Table S1, Model 1.1). The associations were nearly identical when controlling for socio-demographic factors (Table 2, Model 2) and other individual-level covariates (see Supplementary Table S1): social disengagement (Model 2.1: scale $B = 0.16$, SE = 0.015, and binary $B = 0.29$, SE = 0.022, ps <0.001), depressive/negative affect (Model 2.2: scale $B = 0.16$, SE = 0.015, and binary $B = 0.25$, SE = 0.022, ps <0.001), and presence/absence of health problems (Model 2.3: scale $B = 0.16$, SE = 0.016, and binary $B = 0.29$, SE = 0.022, ps <0.001). The association between daily loneliness and trouble concentrating also held controlling for day-level social and contextual factors (Table 2, Model 3). Feeling close to others, a facet related to loneliness, but not a sense of belonging, was associated with trouble concentrating: On days when participants felt closer to others (as compared to their mean-level across assessments), they had less trouble concentrating. In contrast, experiencing a stressful/negative event was associated with having less concentration. The results were similar after excluding individuals with anxiety/depression or neurodegenerative disorders (Supplementary Table S1).

Table 3 reports the association between loneliness and memory lapses. In the basic model (Model 1), loneliness was associated with daily memory lapses only when entered as a binary predictor and not as a scale. That is, on days participants felt lonely (independent of how frequently), they had 59% greater odds of reporting a memory lapse (OR = 1.59, 95%CI = 1.35, 1.87,

Table 2. Multilevel linear regressions predicting trouble concentrating from loneliness.

	Scale predictor: loneliness			Binary predictor: felt lonely (yes/no)		
Model 1	B	SE	*p*	B	SE	*p*
Intercept	0.416	0.011	<.001	0.387	0.011	<.001
Daily loneliness	**0.156**	**0.015**	**<.001**	**0.292**	**0.022**	**<.001**
Estimated variances						
Residual	0.306	0.004	<.001	0.307	0.004	<.001
Intercept	0.190	0.008	<.001	0.175	0.007	<.001
AIC	25,959.1			25,884.9		
Model 2	B	SE	*p* value	B	SE	*p* value
Intercept	0.442	0.027	<.001	0.390	0.026	<.001
Daily loneliness	**0.156**	**0.015**	**<.001**	**0.288**	**0.022**	**<.001**
Level 2 covariates						
Age	−0.004	0.001	<.001	−0.004	0.001	<.001
Female	0.038	0.023	.097	0.043	0.022	.054
Non-white	−0.006	0.032	.860	−0.003	0.031	.935
Education	0.012	0.010	.243	0.014	0.010	.162
Married/with partner	−0.065	0.025	.010	−0.037	0.025	.130
Estimated variances						
Residual	0.306	0.004	<.001	0.307	0.004	<.001
Intercept	0.185	0.008	<.001	0.171	0.007	<.001
AIC	25,932.1			25,862.6		
Model 3	B	SE	*p*	B	SE	*p*
Intercept	0.384	0.026	<.001	0.340	0.026	<.001
Daily loneliness	**0.129**	**0.015**	**<.001**	**0.249**	**0.022**	**<.001**
Level 2 covariates						
Age	−0.004	0.001	<.001	−0.003	0.001	<.001
Female	0.028	0.022	<.001	0.032	0.022	.140
Non-white	0.001	0.031	.966	0.004	0.030	.903
Education	0.006	0.010	.568	0.007	0.009	.442
Married/with partner	−0.071	0.025	.004	−0.046	0.024	.054
Level 1 covariates						
Argument/disagreement	0.143	0.018	<.001	0.141	0.018	<.001
Negative/stressful event	0.151	0.011	<.001	0.149	0.011	<.001
Closeness to others	−0.055	0.009	<.001	−0.053	0.009	<.001
Sense of belonging	−0.012	0.010	.236	−0.012	0.010	.229
Estimated variances						
Residual	0.301	0.004	<.001	0.302	0.004	<.001
Intercept	0.173	0.007	<.001	0.161	0.007	<.001
AIC	25,575.9			25,516.1		

Loneliness (scale) and other Level 1 continuous/ordinal (within-person) covariates were person-mean centered. The scores reflect participants' deviations from their mean level across daily assessments. Level 2 continuous/ordinal (between-person) covariates are grand mean centered. Results from Model 1.1, Models 2.1, 2.2 and 2.3, and sensitivity analyses, are reported in Supplementary Table S1.

The row corresponding to the effect of loneliness is shaded in grey; statistically significant loneliness estimates are in bold.

Table 3. Multilevel logistic regressions predicting memory lapses from loneliness.

	Scale predictor: Loneliness						Binary predictor: Felt lonely (yes/no)					
				95% CI						95% CI		
Model 1	Est.	SE	OR	Lower	Upper	*p*	Est.	SE	OR	Lower	Upper	*p*
Intercept	−0.414	0.035	0.661	0.617	0.708	<.001	−0.459	0.036	0.632	0.589	0.678	<.001
Daily loneliness	0.097	0.062	1.102	0.976	1.244	.116	**0.463**	**0.082**	**1.588**	**1.352**	**1.866**	**<.001**
Estimated variances												
Var(intercept)	1.549	0.082				<.001	1.510	0.080				<.001
−2log likelihood	61864.8						61858.5					
				95% CI						95% CI		
Model 2	Est.	SE	OR	Lower	Upper	*p*	Est.	SE	OR	Lower	Upper	*p*
Intercept	−0.549	0.085	0.578	0.489	0.682	<.001	−0.637	0.086	0.529	0.447	0.625	<.001
Daily loneliness	0.097	0.062	1.102	0.976	1.244	.116	**0.485**	**0.083**	**1.624**	**1.381**	**1.910**	**<.001**
Level 2 covariates												
Age	0.002	0.003	1.002	0.997	1.007	.504	0.002	0.003	1.002	0.997	1.008	.369
Female	0.207	0.072	1.230	1.068	1.417	.004	0.215	0.072	1.240	1.078	1.427	.003
Non-white	0.000	0.101	1.000	0.820	1.220	.999	0.006	0.100	1.006	0.826	1.224	.954
Education	0.164	0.032	1.178	1.107	1.253	<.001	0.167	0.031	1.182	1.112	1.257	<.001
Married/with partner	0.022	0.080	1.023	0.874	1.196	.779	0.072	0.080	1.074	0.919	1.256	.369
Estimated variances												
Var(intercept)	1.526	0.081				<.001	1.482	0.079				<.001
−2log likelihood	61910.4						61903.3					
				95% CI						95% CI		
Model 3	Est.	SE	OR	Lower	Upper	*p*	Est.	SE	OR	Lower	Upper	*p*
Intercept	−0.760	0.083	0.468	0.397	0.552	<.001	−0.835	0.085	0.434	0.367	0.512	<.001
Daily loneliness	0.059	0.063	1.060	0.936	1.201	.356	**0.439**	**0.083**	**1.551**	**1.317**	**1.826**	**<.001**
Level 2 covariates												
Age	0.004	0.003	1.004	0.999	1.009	.109	0.005	0.003	1.005	1.000	1.010	.072
Female	0.173	0.070	1.189	1.036	1.365	.014	0.181	0.070	1.199	1.046	1.374	.009
Non-white	0.022	0.098	1.022	0.843	1.240	.822	0.027	0.098	1.027	0.848	1.244	.784
Education	0.145	0.031	1.155	1.088	1.227	<.001	0.148	0.030	1.160	1.092	1.231	.000
Married/with partner	0.008	0.078	1.008	0.866	1.174	.917	0.053	0.078	1.054	0.906	1.228	.494
Level 1 covariates												
Argument/ disagreement	0.387	0.073	1.472	1.275	1.699	<.001	0.375	0.073	1.455	1.261	1.680	<.001
Negative/stressful event	0.564	0.044	1.758	1.611	1.918	<.001	0.554	0.044	1.740	1.595	1.899	<.001
Closeness to others	0.032	0.037	1.033	0.961	1.110	.380	0.041	0.037	1.041	0.969	1.119	.269
Sense of Belonging	0.064	0.040	1.066	0.985	1.155	.112	0.074	0.040	1.077	0.995	1.166	.067
Estimated variances												
Var(intercept)	1.385	0.076				<.001	1.352	0.075				<.001
−2log likelihood	61834.8						61832.1					

Loneliness (scale) and other Level 1 continuous/ordinal (within-person) covariates were person-mean centered. The scores reflect participants' deviations from their mean level across daily assessments. Level 2 continuous/ordinal (between-person) covariates are grand mean centered. Results from Model 1.1, Models 2.1, 2.2 and 2.3, and sensitivity analyses, are reported in Supplementary Table S2.

The row corresponding to the effect of loneliness is shaded in grey; statistically significant loneliness estimates are in bold.

$p < .001$). When entered as a scale, those participants with higher mean-level of loneliness (but not daily loneliness) reported memory lapses (OR = 1.62, 95%CI = 1.37, 1.92, $p < .001$; Supplementary Table S2, Model 1.1). The association between feeling lonely (yes/no) and memory lapses remained significant controlling for individual-level factors, such as sociodemographic factors (Table 3, Model 2), social disengagement (Supplementary Table S2, Model 2.1: OR = 1.63, 95%CI = 1.39, 1.92, $p < .001$), depressive/negative affect (Model 2.2: OR = 1.46, 95%CI = 1.24, 1.72, $p < .001$), and health problems (Model 2.3: OR = 1.62, 95%CI = 1.37, 1.90, $p < .001$), and other day-level social and contextual factors (Table 3, Model 3). The association also held when individuals with anxiety/depression or neurodegenerative disorders were excluded (Supplementary Table S2). Feeling lonely as a binary predictor was further associated with higher irritation ($B = 0.33$, SE = 0.09, $p < .001$) and interference ($B = 0.23$, SE = 0.05, $p < .001$) for those who experienced daily memory lapses, while loneliness as a scale was associated with interference ($B = 0.12$, SE = 0.04, $p = .004$), but not irritation with memory lapses. These latter associations held controlling for individual-level and day-level covariates (see Supplementary Table S3 and S4); however, daily loneliness was no longer associated with interference when excluding individuals with anxiety/depression.

Exploratory analysis

The association between loneliness and cognitive outcomes generally did not vary by age, sex, or other socio-demographic factors (Supplementary Tables S5 and S6). One exception was a significant interaction between daily loneliness (both as scale and binary variable) and age predicting trouble concentrating: The association between loneliness and having difficulties concentrating was slightly stronger among relatively younger participants (age [median] < 57 [$n = 898$]: scale $B = 0.20$, SE = 0.02, and binary $B = 0.34$, SE = 0.03, ps <0.001), compared to relatively older participants (age ≥ 57 [$n = 930$]: scale $B = 0.11$, SE = 0.02 and binary $B = 0.24$, SE = 0.03, ps <0.001). Age-stratified analyses supported this age-dependent pattern with a stronger association for adults below 40 (scale $B = 0.20$, SE = 0.05, and binary $B = 0.35$, SE = 0.06, ps <0.001 [$n = 210$]), followed by those aged 40-to-64 (scale $B = 0.16$, SE = 0.02, and binary $B = 0.30$, SE = 0.03, ps <0.001 [$n = 1059$]) and those 65 and older (scale $B = 0.13$, SE = 0.03, and binary $B = 0.23$, SE = 0.04 ps <0.001 [$n = 559$]). Additionally, age had a main effect on concentration: Relatively younger participants reported more trouble concentrating than relatively older participants.

Another significant interaction was observed between daily loneliness (as a scale) and education, indicating a stronger

association of loneliness with trouble concentrating among participants with higher levels of education (college degree or higher: $B = 0.20$, SE = 0.02, $p < .001$), compared to lower education ($B = 0.13$, SE = 0.02, $p < .001$). This interaction, however, was not significant when loneliness was entered as a binary variable in the analysis.

Discussion

This study examined the within-person association between loneliness and subjective cognitive concerns in a national sample of middle-aged and older Americans. In line with our hypothesis, feeling lonely was associated with worse subjective cognition in everyday life: On days participants reported feeling lonely (independent of the frequency of those feelings), they also reported more trouble concentrating and were more likely to experience memory lapses. Feeling lonely was also associated with feeling more irritated by the memory lapses, and reporting that those lapses interfered with their daily routine. The associations held controlling for individual- and day-level covariates, and when excluding individuals with anxiety/depression or neurodegenerative disorders.

This study adds to the growing literature identifying loneliness as a risk factor for cognitive health (see Lee et al., 2025; Luchetti et al., 2024), even when experienced as a transitory state (Kang et al., 2024; Zhong et al., 2016). For example, Kim and Hwang (2024) found 'transitions into loneliness' were associated with worse cognitive performance across study waves, while 'transitioning out' of such a state had a positive (protective) association with cognitive performance. In the context of daily life, feeling lonely may function as a stressor that interferes with cognitive/attentional resources and disrupts daily activities. Indeed, studies have linked daily/momentary feelings of loneliness with many aspects of daily life (e.g. stress and poor social interactions) that have an impact on cognitive functioning (e.g. Stuart et al., 2024; Zhaoyang et al., 2021). In line with this body of work, our study identifies a daily association between loneliness and several aspects of subjective cognition: daily difficulties concentrating, memory lapses, and irritation and interference caused by these lapses. Daily experiences of loneliness (as well as their mean-level frequency across days) were associated with self-reported cognitive problems. The association with memory lapses, however, may depend, in part, on how loneliness is operationalized. That is, loneliness was only associated with memory lapses when entered as a binary predictor in the analysis (i.e. any loneliness during the day, yes/no), and not when entered as a frequency scale. In other words, it was the presence/absence of loneliness, more than its frequency throughout the day, that was associated with daily reports of memory problems. One possible interpretation is that daily memory functioning may operate through a threshold mechanism in relation to social stressors, where even brief experiences of loneliness may divert resources away from encoding and/or retrieval processes. It is important to note that the item used in this study assessed how often loneliness occurred over a day and not the magnitude (i.e. intensity) of loneliness when present. Magnitude, as well as frequency/duration, may be differentially associated with daily cognitive complaints. In addition, the content of daily social functioning might matter, as well. In the current analysis, for example, feeling close to others, but not a sense of belonging, was associated with having less trouble concentrating during the day, but a similar effect was not observed for memory lapses. In line with other studies (e.g. Sliwinski et al., 2006; Stuart et al., 2024), experiencing stressful/negative events (e.g. arguing with someone) was also related to poor daily subjective cognition. Notably, loneliness was independently associated with subjective cognitive concerns, even when accounting for these relevant aspects of daily social functioning.

Exploratory analysis indicated the daily association between loneliness and subjective cognition generally did not vary by socio-demographic factors. One exception was an interaction with age when predicting trouble concentrating: Daily loneliness (both as scale and binary variable) was associated with more trouble concentrating, particularly among younger participants. In the current sample, problems of concentration were more frequently reported among younger adults than older adults. Younger adults, as compared to older adults, may be more exposed and more sensitive to daily stressors, including interpersonal tensions (e.g. Birditt et al., 2005; Neupert et al., 2007), with consequences on their daily (cognitive) functioning. On the other hand, older adults may have different expectations about social relationships and may be less distressed by temporary feelings of loneliness, making these experiences potentially less disruptive. There was also an interaction with education, suggesting that the association between loneliness and trouble concentrating was slightly stronger among individuals with higher level of education, a finding in contrast to studies of objective cognitive function (Lee et al., 2025). However, loneliness did not interact with age or education when predicting memory lapses. The observed interactions should be interpreted with caution and warrant replication in other samples.

This study has several strengths, including the use of a large sample and daily assessments of loneliness and subjective cognition. There are also limitations that need to be addressed in future research. In particular, while we found support for an association between daily loneliness and subjective cognition, additional work is needed to identify possible mechanisms and moderators of this association. For instance, individuals prone to stress, anxiety and depression, may experience more frequent or intense loneliness and thus report more cognitive problems. In the current analysis, however, the association between daily loneliness and subjective cognition held controlling for depressive/negative affect and excluding participants with anxiety/depression or any type of neurodegenerative disorder. In addition, the current work does not address the directionality of the association. While loneliness is typically identified as a precursor of cognitive problems, an inverse association where poor cognition leads to loneliness is plausible (e.g. Cachón-Alonso et al., 2023). In everyday life, individuals who report subjective cognitive concerns may experience more frequent cognitive dysfunction. For these individuals, social interactions, particularly with less familiar social partners (Huxhold et al., 2022), may require additional cognitive processing that generates stress and impairs the ability to connect with others, leading to increases in loneliness. Future research should include measures that tap into different aspects (intensity/duration) and sources of daily loneliness (e.g. social context, motives and expectations) and objective and subjective cognitive function with a higher temporal resolution (e.g. multiple assessments during the day) to provide more fine-grained insights of their association in daily life. Lastly, our sample included predominantly White Americans. Future work should include more diverse samples to test the generalizability of the results to other countries, cultures, and race/ethnic minorities (Camacho et al., 2025).

In sum, this study found a within-person, daily association between loneliness and subjective cognitive concerns: On days when participants felt lonely, they had trouble concentrating, more memory lapses, and felt more irritation and interference associated with those lapses. These results hold theoretical and practical significance. From a theoretical perspective, our study supports the hypothesis that loneliness is a stressor that can disrupt cognitive (and daily) functioning. Even when transitory, loneliness is associated with poor perceptions of cognitive function, a marker with implications for future risk of cognitive decline (Liew, 2020), as well as for the ability to meet everyday demands. From a practical perspective, understanding the day-to-day dynamics between loneliness and cognitive concerns helps identify individuals who may be most vulnerable to long-term cognitive difficulties. Indeed, such daily dynamics may have detrimental effects that accumulate over time. More research is needed to translate these results into practical recommendations and directions that could inform the development of just-in-time interventions to manage daily fluctuations in loneliness and related cognitive difficulties.

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Data availability statement

This study uses data from the National Study of Daily Experiences, part of the Midlife in the United States (MIDUS) study, that is available after registration at: https://midus.colectica.org/Account/Login?returnUrl=/

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