

# Purpose in life mitigates digital disconnection in older adults

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**Decision Editor:** Samuele Zilioli, PhD (Psychological Sciences Section)

## Abstract

**Objectives:** Digital engagement is increasingly recognized as a social determinant of health that influences well-being in aging populations. However, disparities in digital access and engagement contribute to social isolation, particularly among older adults who may experience technological barriers. While digital interactions have the potential to mitigate loneliness, their effectiveness varies widely, indicating systematic differences in how engagement corresponds to loneliness across individuals. Here, we introduce the concept of *digital disconnection*—the mismatch between the frequency of digital social contact and experienced loneliness—and examine whether purpose in life (PIL) mitigates this phenomenon in later life.

**Methods:** Using cross-sectional surveys and daily diary data from two independent cohorts in the Midlife in the United States (MIDUS III:  $N = 2,864$ ; MIDUS Refresher:  $N = 2,522$ ) study, we quantified digital disconnection as individual deviations in loneliness from predicted levels based on patterns of digital contact.

**Results:** Purpose in life was inversely associated with digital disconnection in both surveys ( $B = -0.51$  and  $B = -0.60$ ,  $p < .001$ ) and micro-longitudinal assessments ( $B = -0.38$  and  $B = -0.37$ ,  $p < .001$ ), indicating that older adults with higher PIL showed lower residual loneliness after accounting for their level of digital engagement.

**Discussion:** These findings refine theoretical models of digital social processes by identifying purpose as a modifiable psychological resource that may help older adults navigate the challenges of technology-mediated social interactions.

**Keywords:** Social determinants of health, Micro-longitudinal assessments, Social isolation, Technology

The rapid proliferation of digital communication technologies has reshaped social connectivity across the life course, offering new opportunities for maintaining relationships and expanding social networks. Despite these advancements, loneliness remains a public health concern, particularly among older adults. Epidemiological data indicate that approximately half of U.S. adults experience regular loneliness, with heightened prevalence among those lacking strong social support (Ernst et al., 2022; Office of the Surgeon General, 2023). This issue is especially pronounced in later life, as shifts in social roles and networks often lead to increased social isolation (Graham et al., 2024; Holt-Lunstad et al., 2015).

Against this backdrop, efforts to reduce loneliness increasingly leverage digital communication, yet outcomes remain highly variable (Luo et al., 2025; Mozafar Saadati et al., 2021; Zhang et al., 2022). While digital access is a recognized social determinant of health (National Academies of Sciences, 2020), it is distinct from engagement, which refers to the frequency and pattern of use. Some older adults report lower loneliness with digital contact (Cotten et al., 2013; Valkenburg & Peter, 2007), whereas others remain lonely despite frequent engagement (Nowland et al., 2018; Vahedi & Zannella, 2021). These mixed findings suggest that neither access nor engagement frequency alone determines loneliness. Instead, individual

psychological resources that operate independently of digital factors may play a role in regulating social and emotional well-being.

## Theoretical framework for digital disconnection

Digital disconnection denotes social–emotional misalignment in technology-mediated contexts. We operationalize it as residualized loneliness—the variance in loneliness that remains unexplained after statistically accounting for digital contact frequency. This residualized approach, grounded in contemporary resilience frameworks (Kalisch et al., 2021; Ong et al., 2023), isolates individual differences in loneliness that cannot be attributed to engagement levels alone. The construct addresses a central empirical paradox in later life technology use: some older adults report persistent loneliness despite frequent digital contact, whereas others do not report elevated loneliness even with minimal contact.

This residualized framing parallels discrepancy-based metrics used previously in social and health research. Ong et al. (2023) applied similar residualized scoring to measure social asymmetry—the discrepancy between loneliness and social isolation (see also McHugh et al., 2017)—finding associations between

greater social asymmetry and poorer physical health (Ong et al., 2025). Supporting the clinical validity of such methods, a systematic review and meta-analysis of 54 studies by Bocancea et al. (2021) demonstrated that residual measures of resilience and resistance in aging and Alzheimer's Disease capture clinically meaningful variation with prognostic value for cognitive decline. Applied to digital contexts, the residual score represents the portion of loneliness that remains unexplained by digital engagement. Positive residuals indicate higher-than-statistically-predicted loneliness, while negative residuals indicate lower-than-statistically-predicted loneliness given engagement levels.

The residualized approach offers distinct methodological advantages. First, it separates objective engagement frequency from subjective loneliness experiences, avoiding confounds inherent in simple frequency measures. Second, standardized residual scores enable direct comparisons across individuals and time points, positioning participants along a vulnerability-to-resilience continuum (Kalisch et al., 2021; Ong et al., 2023). Third, unlike traditional moderation analyses that assume uniform social media-loneliness relationships—an assumption contradicted by inconsistent empirical findings (Luo et al., 2025; Zhang et al., 2022)—this framework accommodates heterogeneous associations by identifying individuals whose loneliness deviates from statistical prediction.

Conceptually, this approach reframes disconnection as the experiential gap between being digitally connected and feeling socially connected, rather than mere absence of technology use. This gap is particularly evident among older adults who, despite frequent digital engagement, report persistent loneliness due to diminished nonverbal cues, asynchronous communication, and difficulties forming meaningful online relationships (Nowland et al., 2018). Identifying psychological resources that bridge this gap is therefore critical for informing targeted interventions.

One such resource is purpose in life (PIL), a psychological asset consistently linked to psychosocial well-being and physical health (Kashdan et al., 2024; Kim et al., 2022). Contemporary theoretical models suggest that purpose may shape digital social experiences through several mechanisms. First, as a self-organizing framework, purpose may direct attentional and behavioral resources toward valued social goals (Kashdan et al., 2024), potentially optimizing engagement with digital platforms in ways that foster social connection. Second, purpose may enhance self-regulatory capacity (McKnight & Kashdan, 2009), supporting more intentional and adaptive patterns of digital social interaction. Third, purpose may provide a structured lens for evaluating social experiences (Burrow & Rainone, 2017), potentially mitigating susceptibility to maladaptive social comparison processes that are often amplified in digital environments (Verduyn et al., 2020). Collectively, these mechanisms suggest that PIL may not only foster social engagement but also influence how individuals navigate, interpret, and derive meaning from their digital interactions.

Empirical evidence supports these theoretical perspectives, demonstrating that PIL is consistently associated with psychological resilience, lower allostatic load, and stronger social integration, particularly during periods of isolation (Kang et al., 2021; Kashdan et al., 2024; Sutin et al., 2022; Zilioli et al., 2015). Yet how PIL relates to digital disconnection remains underexamined. This question is salient because psychological resources appear to shape how people engage with digital platforms and how that engagement corresponds to loneliness and well-being (Luo et al., 2025; Yin et al., 2024). Although digital

communication can help maintain social ties, associations with loneliness are heterogeneous, especially among older adults who may face both structural and emotional challenges. Clarifying how PIL influences digital social experiences can, therefore, provide critical insights into strategies that enhance digital engagement and promote well-being in later life.

Accordingly, the present investigation examined PIL as a psychological resource that promotes resilience against digital disconnection, using data from two independent samples from the Midlife in the United States (MIDUS) study. These two cohorts differ in age composition, socioeconomic status, and digital access, allowing us to assess whether the relationship between PIL and digital disconnection generalizes across diverse demographic backgrounds. We employed both cross-sectional and micro-longitudinal designs to test the central hypothesis that PIL reduces loneliness beyond what is explained by social media engagement. Building on established theoretical frameworks and empirical evidence (Kalisch et al., 2021; Ong et al., 2023), we operationalized digital disconnection as the deviation between statistically predicted and experienced loneliness relative to observed digital social contact levels. We hypothesized that higher PIL would be associated with lower digital disconnection, indicating less loneliness than statistically predicted given engagement levels.

## Method

### Transparency and openness

Data and materials from the Midlife in the United States (MIDUS) study, including codebooks, survey instruments, and variable descriptions, are publicly available through the MIDUS Colectica Portal (<https://midus.colectica.org/>). The analysis script is available from the corresponding author upon request. This study meets Level 2 requirements for open science practices.

### Study design and sampling

We analyzed data from two parallel cohorts within the Midlife in the United States (MIDUS) study: MIDUS III ( $N=2,864$ ) and MIDUS Refresher ( $N=2,522$ ). These two cohorts provide a unique opportunity to assess the consistency of findings across different samples within a single study. The MIDUS-III cohort data were collected during a period of relative economic prosperity. In contrast, the MIDUS Refresher cohort data were collected during the Great Recession, when GDP declined and the unemployment rate doubled (US Bureau of Economic Analysis, 2024; US Bureau of Labor Statistics, 2024). Despite these differences in macroeconomic conditions, the same study procedures were followed, and identical measures were administered in both cohorts. Assessment protocols incorporated structured telephone interviews and validated self-administered questionnaires measuring psychosocial functioning, health status, and behavioral patterns across multiple domains.

### Measures

Purpose in Life was assessed using the seven-item PIL subscale from the Ryff Psychological Well-Being Scales (Ryff, 1989). Participants rated agreement with statements (e.g., "I have a sense of direction and purpose in life") on a 7-point Likert scale. Internal consistency was adequate across MIDUS III ( $\alpha=0.74$ ) and Refresher ( $\alpha=0.75$ ) cohorts.

Loneliness was assessed using a validated three-item scale measuring feelings of isolation, interpersonal closeness, and belongingness. Participants rated how often they experienced each feeling on a 4-point scale (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*), with higher scores indicating greater loneliness. Internal consistency was adequate across both cohorts (MIDUS III  $\alpha = 0.77$ ; Refresher  $\alpha = 0.79$ ).

Digital social contact frequency was measured using two items assessing communication patterns with non-cohabiting family and friends. Participants reported how frequently they contacted family members (siblings, parents, or children not living with them) and friends via digital platforms, including email, text messages, and social media sites (e.g., Facebook, Twitter). Both items used an 8-point scale ranging from 1 (*never or hardly ever*) to 8 (*several times a day*), with intermediate options: “less than once a month,” “once a month,” “2 or 3 times a month,” “once a week,” “several times a week,” and “once a day.” Items were reverse-coded so higher scores indicate more frequent contact, then averaged to create a composite score with acceptable internal consistency (MIDUS III  $\alpha = 0.85$ ; Refresher  $\alpha = 0.82$ ). All measures were transformed using percent of maximum possible (POMP) scaling (0–100) to enable standardized comparisons across samples and measures (Cohen et al., 1999). Daily social media use was measured as the total minutes participants spent on platforms such as Facebook and Twitter, with responses recorded in hours and minutes then converted to total daily minutes (range: 0–1,440).

### Covariates

Demographic factors, health characteristics, and mental health indicators were included in models to account for confounding influences. Sociodemographic covariates included age (in years), gender (Ref: male), race (white vs. nonwhite), household income (in quintiles), education (1–12; 1 = no school/some grade school, 12 = doctoral/professional degree), marital status (1 = married/cohabiting, 2 = not married/cohabiting), and household size (number of residents). Health characteristics included self-reported number of chronic conditions and general health status, measured on a 0 to 10 scale (0 = “the worst possible health,” 10 = “the best possible health”). Depression and anxiety measures were also included as covariates. Depression was assessed with the 20-item Center for Epidemiological Studies-Depression Scale (CESD; Radloff, 1977), while anxiety was measured with the 11-item anxiety subscale of the Mood and Symptom Questionnaire (MASQ-A; Clark & Watson, 1991).

### Analytic strategy

To assess whether PIL is associated with variation in loneliness beyond what is explained by social media use, we operationalized digital disconnection using a residualized score methodology. This approach isolates individual differences in loneliness after accounting for digital social contact, providing an empirical test of PIL’s role in shaping social well-being in digital contexts. Rather than indicating disengagement from technology, digital disconnection operationally represents residual loneliness—the variance in loneliness that remains unexplained after accounting for digital engagement frequency. This captures individual differences in loneliness that persist independent of online activity levels.

To compute trait-level digital disconnection, we regressed trait loneliness on digital social contact, generating standardized residuals that indicate whether an individual experiences

more or less loneliness than statistically predicted, given their level of digital social engagement. Daily disconnection indices were similarly computed as within-person centered residuals, derived from 8-day averaged assessments of loneliness and digital social contact. All models included demographic covariates to account for potential omitted variable bias, ensuring that residualized scores capture deviations in loneliness beyond demographic influences. Additionally, final models adjusted for key mental health factors (depression, anxiety) and health-related characteristics (chronic conditions, functional status) that could confound the association between PIL and digital disconnection. Continuous variables were standardized to facilitate interpretability, while categorical variables were binary-coded to maintain consistency in model estimation.

## Results

### Sample statistics

Demographic analyses revealed distinct age distributions between cohorts (Table 1), with the MIDUS III analytical sample ( $N = 2,431$ ) exhibiting a higher mean age ( $M = 63.64$  years,  $SD = 11.35$ ) compared to the MIDUS Refresher cohort ( $N = 2,171$ ;  $M = 50.51$  years,  $SD = 14.38$ ). Both samples demonstrated comparable sociodemographic compositions, with a predominant representation of female (MIDUS III: 54.9%; Refresher: 51.9%) and White (MIDUS III: 88.7%; Refresher: 81.8%) participants. The micro-longitudinal subsamples

**Table 1.** Sample characteristics of MIDUS III and MIDUS refresher cohorts.

Variable	MIDUS III	MIDUS refresher
<b>Demographics</b>		
Age, <i>M</i> ( <i>SD</i> )	63.64 (11.35)	50.51 (14.38)
Gender, <i>n</i> (%)		
Female	1,810 (54.9)	1,856 (51.9)
Race/ethnicity, <i>n</i> (%)		
White	2,923 (96.0)	2,925 (91.5)
Black	122 (4.0)	273 (8.5)
Annual income, <i>n</i> (%)		
\$0–100,000	1,815 (55.1)	2,133 (64.8)
\$100,001–200,000	638 (19.4)	282 (8.6)
\$200,001–300,000	259 (7.9)	60 (1.8)
Mean income, \$ ( <i>SD</i> )	87,920 (74,040)	52,003 (52,783)
<b>Health characteristics</b>		
Self-rated health, <i>M</i> ( <i>SD</i> )	7.33 (1.60)	7.31 (1.68)
Chronic conditions, <i>M</i> ( <i>SD</i> )	3.26 (3.15)	2.87 (3.12)
<b>Psychological variables</b>		
Purpose in life, <i>M</i> ( <i>SD</i> )	42.50 (11.78)	5.47 (1.01)
Depression, <i>M</i> ( <i>SD</i> )	0.47 (1.57)	0.66 (1.83)
Anxiety, <i>M</i> ( <i>SD</i> )	0.13 (0.92)	0.24 (1.22)
<b>Survey measures</b>		
Loneliness, <i>M</i> ( <i>SD</i> )	2.07 (0.77)	2.16 (0.84)
Social media use, <i>M</i> ( <i>SD</i> )	3.90 (2.47)	4.40 (2.37)
<b>Daily study measures</b>		
Loneliness, <i>M</i> ( <i>SD</i> )	0.79 (0.59)	0.91 (0.62)
Social media use, min/day ( <i>SD</i> )	24.24 (35.77)	24.71 (48.43)

*Note.* MIDUS = Midlife in the United States. *M* = Mean; *SD* = Standard deviation. Daily study measures were collected from a subset of participants (MIDUS III:  $N = 907$ ; MIDUS Refresher:  $N = 675$ ). Purpose in Life scores for MIDUS III are reported on a 0–100 scale, while MIDUS Refresher scores are reported on a 1–7 scale. Social Media Use for survey measures was assessed on a 1–8 scale. Depression and Anxiety scores range from 0 to 7. Self-rated Health ranges from 0 to 10.

**Table 2.** Associations between purpose in life and digital disconnection in survey data.

Predictor	MIDUS III (N=2,431)	MIDUS refresher (N=2,171)
<b>Unadjusted model</b>		
Intercept	65.85 (1.38)***	72.58 (1.58)***
Purpose in life	-0.51 (0.02)***	-0.58 (0.02)***
<b>Adjusted model</b>		
Intercept	62.04 (1.78)***	61.00 (1.95)***
Purpose in life	-0.42 (0.02)***	-0.45 (0.02)***
<b>Covariates</b>		
Age	-0.28 (0.03)***	-0.17 (0.03)***
Gender	-1.16 (0.63)	0.54 (0.73)
Income	-0.76 (0.34)*	-0.05 (0.37)
Race	-0.13 (1.65)	1.42 (1.33)
Self-rated health	-2.20 (0.36)***	4.10 (0.40)***
Chronic conditions	1.31 (0.36)***	2.08 (0.40)***
Depression	2.91 (0.34)***	-2.13 (0.40)***
Anxiety	0.98 (0.38)*	1.98 (0.41)***

Note. MIDUS=Midlife in the United States. Values are presented as unstandardized coefficient (SE). Gender was coded as 1=female, 0=male. Race was coded as 1=White, 0=nonwhite.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

maintained demographic proportionality (MIDUS III:  $N=907$ ,  $M=62.71$  years,  $SD=10.39$ ; MIDUS Refresher:  $N=675$ ,  $M=47.91$  years,  $SD=12.67$ ).

### PIL and digital disconnection

Initial analyses examined digital disconnection indices derived using residualized score methodology. These indices capture a continuum from social vulnerability (positive residuals) to social resilience (negative residuals), providing a framework for assessing individual differences in digital social experiences (Supplementary Figures 1–4, see [online supplementary material](#)). We hypothesized that higher PIL would be related to lower digital disconnection, reflecting greater resilience. Trait-level analyses revealed robust negative associations between PIL and digital disconnection across both cohorts (MIDUS III:  $B = -0.51$ ,  $SE = 0.02$ ; MIDUS Refresher:  $B = -0.45$ ,  $SE = 0.02$ ). These relationships maintained significance after comprehensive adjustment for demographic (age, gender, race, income), health (self-rated health, chronic conditions), and psychological (depression, anxiety) covariates (MIDUS III:  $B = -0.42$ ,  $SE = 0.02$ ; MIDUS Refresher:  $B = -0.58$ ,  $SE = 0.02$ , all  $ps < .001$ ; see [Table 2](#) and [Supplementary Figures 5 and 6](#), see [online supplementary material](#)).

Complementary micro-longitudinal analyses provided convergent evidence for PIL's association with digital disconnection. Analysis of daily assessments revealed consistent inverse associations between PIL and digital disconnection magnitude across both samples (MIDUS III:  $B = -0.399$ ,  $SE = 0.02$ ; MIDUS Refresher:  $B = -0.34$ ,  $SE = 0.03$ ), with associations maintaining significance in fully adjusted models (MIDUS III:  $B = -0.32$ ,  $SE = 0.03$ ; MIDUS Refresher:  $B = -0.31$ ,  $SE = 0.03$ , all  $ps < .001$ ; see [Table 3](#) and [Supplementary Figures 7 and 8](#), see [online supplementary material](#)). The consistency of these relationships suggests that purpose functions as a stable resilience factor associated with lower digital disconnection across measurement contexts.

**Table 3.** Associations between purpose in life and digital disconnection in daily data.

Predictor	MIDUS III (N=907)	MIDUS refresher (N=675)
<b>Unadjusted model</b>		
Intercept	30.05 (1.85)***	54.41 (2.14)***
Purpose in life	-0.40 (0.02)***	-0.34 (0.03)***
<b>Adjusted model</b>		
Intercept	29.13 (2.41)***	52.16 (2.94)***
Purpose in life	-0.32 (0.03)***	-0.31 (0.03)***
<b>Covariates</b>		
Age	-0.16 (0.04)***	-0.18 (0.04)***
Gender	-2.66 (0.86)**	-1.29 (1.08)
Income	-1.23 (0.46)**	1.19 (0.55)*
Race	0.21 (2.30)	3.50 (2.05)
Self-rated health	1.19 (0.47)*	1.21 (0.53)*
Chronic conditions	0.50 (0.65)	0.33 (0.52)
Depression	-1.63 (0.54)**	-1.43 (0.60)*
Anxiety	1.10 (0.53)*	1.10 (0.60)

Note. MIDUS=Midlife in the United States. Values are presented as unstandardized coefficient (SE). Gender was coded as 1=female, 0=male. Race was coded as 1=White, 0=Black.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### Sensitivity analyses

We conducted sensitivity analyses to assess the robustness of the association between PIL and digital disconnection by adding education, marital status, and household size to the adjusted models. After including these covariates, the negative association between PIL and digital disconnection remained robust in both cohorts (MIDUS III:  $B = -0.40$ ,  $SE = 0.02$ ; MIDUS Refresher:  $B = -0.43$ ,  $SE = 0.02$ ; [Supplementary Table 1](#), see [online supplementary material](#)). Notably, these additional covariates explained minimal additional variance beyond our primary model, suggesting that the association between PIL and digital disconnection is largely independent of measured sociodemographic factors. We also estimated micro-longitudinal models using daily data to assess the direction and magnitude of the PIL effect. Results remained consistent with the cross-sectional findings (MIDUS III:  $B = -0.32$ ,  $SE = 0.03$ ; MIDUS Refresher:  $B = -0.31$ ,  $SE = 0.03$ ; see [Supplementary Table 2](#), see [online supplementary material](#)).

### Discussion

This investigation advances understanding of PIL as a resilience-related resource shaping experiences of technology-mediated social interaction. Using trait (survey) and daily (micro-longitudinal) data from two independent national cohorts, three findings emerged: (1) digital disconnection, measured as residual loneliness after accounting for engagement frequency, varies substantially across individuals; (2) PIL is inversely associated with digital disconnection in both survey and daily analyses; and (3) these associations remain robust to comprehensive covariate adjustment.

These findings extend social determinants of health frameworks by operationalizing digital engagement as a social exposure and disconnection as residual loneliness. The substantial variance in residual loneliness—unexplained by engagement frequency alone—highlights individual heterogeneity in how

digital contact corresponds with loneliness outcomes. As digital technologies become integral to social life, this heterogeneity has implications for health trajectories in aging populations (National Academies of Sciences, 2020). Purpose in life accounted for significant variance in these residuals, with higher PIL consistently associated with lower-than-predicted loneliness across both cohorts. This pattern suggests that interventions targeting digital access or usage frequency without addressing psychological correlates may have limited effectiveness in reducing loneliness among digitally engaged older adults.

### Theoretical and methodological implications

Our findings extend research linking PIL with well-being by examining its association with digital disconnection. While prior work documents associations between PIL and social integration (Kang et al., 2021; Kashdan et al., 2024), the present findings demonstrate that PIL influences how individuals experience digital social interactions. Individuals with higher PIL showed loneliness levels below statistical predictions given their engagement patterns, aligning with theoretical perspectives suggesting that purpose enhances self-regulatory capacity (McKnight & Kashdan, 2009) and provides a structured framework for evaluating interpersonal experiences (Burrow & Rainone, 2017).

Importantly, digital disconnection, as operationalized here, captures variance unexplained by engagement frequency alone. This approach recognizes that loneliness outcomes vary substantially even among individuals with similar usage patterns (Verduyn et al., 2020). Our analyses revealed that PIL accounts for significant portions of this residual variance. These patterns held across both cross-sectional and daily diary assessments, strengthening confidence in the findings. For aging populations, these results highlight heterogeneity in how digital engagement corresponds with loneliness. Many older adults maintain frequent digital contact yet report persistent loneliness (Nowland et al., 2018). Our findings suggest that individual differences in psychological factors, such as PIL, may explain why some individuals exhibit this disconnection pattern while others do not.

From an intervention perspective, these findings suggest that programs targeting only digital access or usage frequency may incompletely address loneliness. Incorporating purpose-related components—such as connecting technology use to meaningful goals or volunteer activities—warrants investigation in experimental designs. Future research should test whether purpose-focused interventions produce different outcomes than standard digital literacy training, particularly for diverse populations facing multiple barriers to digital engagement (Luo et al., 2025).

### Limitations and future directions

Several limitations warrant consideration. First, because our samples were drawn from urban and suburban populations, the findings may not generalize to rural communities, where technology access and engagement patterns often differ. Second, our findings apply only to individuals with reliable digital access and should not be interpreted as PIL helping people derive greater benefits from technology use. Instead, PIL represents a unique resilience resource that mitigates loneliness independent of digital engagement. Third, our predominantly White samples (89%–96%) limit generalizability to racially

and ethnically diverse populations who face unique digital barriers—including language differences, cultural representation gaps, and online discrimination—that may alter associations between engagement and loneliness. Fourth, we measured only engagement frequency, not interaction quality, platform types, or communication modalities. Fifth, cross-sectional designs preclude temporal or causal inferences about PIL-disconnection associations. Finally, while daily diaries captured within-person variation, they lacked contextual factors (work schedules, caregiving, health symptoms) that shape digital engagement opportunities.

Future research should address these gaps by broadening sampling to rural settings, including individuals with limited or intermittent connectivity, and oversampling racially and ethnically diverse older adults. Measurement should extend beyond frequency to capture interaction quality (e.g., depth, reciprocity, emotional tone, synchrony) using mixed methods and, where feasible, digital-trace indicators. Longitudinal and micro-longitudinal designs (e.g., cross-lagged and within-person lagged models) are needed to establish directionality and test whether purpose prospectively predicts changes in digital disconnection. Experience-sampling protocols can track real-time dynamics while assessing daily context, and mechanism-focused studies should evaluate potential mediators such as attentional control, social comparison, and emotion regulation to clarify how purpose influences digital social experiences.

### Conclusions

This study documented inverse associations between PIL and digital disconnection across two national cohorts using cross-sectional and daily diary designs. Older adults with higher PIL demonstrated less loneliness than statistically predicted, given their digital engagement levels. These results refine models of technology-mediated social processes by identifying PIL as a resilience-related psychological resource that shapes how older adults experience digital contact. As digital technologies become increasingly integral to social life, interventions that focus only on access or use are unlikely to be adequate on their own; pairing engagement efforts with strategies that cultivate purpose and related resources may better support social and emotional well-being in later life and help digital engagement foster meaningful connections.

### Supplementary material

Supplementary data are available at *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* online.

### Funding

This research was supported, in part, by Grant P01-AG020166 from the National Institute on Aging to conduct a longitudinal follow-up of the MIDUS (Midlife in the United States) investigation. The original study was supported by the John D. and Catherine T. MacArthur Foundation Research Network on Successful Midlife Development.

### Conflict of interest

None declared.

## Data availability

Data and documentation for MIDUS are publicly available from the Inter-university Consortium for Political and Social Research (<https://www.icpsr.umich.edu/icpsrweb>).

## Author contributions

Anthony D. Ong contributed to the conceptualization, drafted the original manuscript, and participated in review and editing. Yichen Wang contributed to formal analysis and review and editing of the manuscript.

## Acknowledgments

This work was completed while Anthony D. Ong was on sabbatical leave at Harvard University, Cambridge, Massachusetts.

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