Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Distinct Personality and Motivational Profiles of Loneliness and Positive Solitude

Veronika Juríčková

veronika.jurickova@nudz.cz

National Institute of Mental Health

Nikola Doubková

National Institute of Mental Health

Radek Heissler

National Institute of Mental Health

Karolína Knížková

National Institute of Mental Health

Pavel Mohr

National Institute of Mental Health

Marek Preiss

National Institute of Mental Health

Research Article

Keywords: loneliness, positive solitude, personality functioning, maladaptive traits, motivation

Posted Date: November 26th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11871867/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

Loneliness and positive solitude are often treated as related experiences of being alone, yet their psychological correlates remain poorly differentiated. We examined the unique contributions of personality functioning, maladaptive personality traits, and motivational orientations to loneliness and positive solitude in 1,725 Czech adults. Hierarchical regression analyses showed markedly different patterns of associations. Loneliness was most strongly associated with impairments in personality functioning, Detachment, Negative Affectivity, and Non-Self-Determined motives for being alone. In contrast, positive solitude was primarily associated with Self-Determined motivation, whereas personality functioning and maladaptive traits showed comparatively smaller associations. These findings support the conceptual distinction between maladaptive and adaptive experiences of aloneness and highlight motivation orientation as a central factor differentiating positive solitude from loneliness and personality-related vulnerability.

Keywords: loneliness, positive solitude, personality functioning, maladaptive traits, motivation

1. Introduction

Loneliness is increasingly recognized as a major psychological and public health concern (Hawkley & Cacioppo, 2010; Holt-Lunstad et al., 2015), leading some scholars to describe it as a modern behavioral epidemic (Jeste et al., 2020). However, longitudinal data and cross-temporal meta-analyses show that media narratives about the "loneliness epidemic," present even in studies in the 1970s, can be misleading and exaggerated (Buecker et al., 2021; Ortiz-Ospina & Roser, 2019). Rather than reflecting objective social isolation, loneliness is defined as the distressing subjective experience that arises when perceived social relationships fail to meet an individual's desired level of social connection (de Jong-Gierveld & van Tilburg, 2006; Hawkley & Cacioppo, 2010; Jeste et al., 2020). People may experience loneliness despite

frequent social contact, whereas others may spend considerable time alone without feeling lonely (Holt-Lunstad et al., 2015).

However, being alone is not inherently maladaptive. Solitude may be a voluntary, psychologically beneficial experience that offers opportunities for self-reflection, emotional regulation, creativity, and restoration (Long & Averill, 2003; Nguyen et al., 2018; Palgi et al., 2021). Whereas loneliness reflects perceived deficiencies in social relationships, positive solitude reflects the ability to experience time alone as meaningful and restorative (Thomas & Azmitia, 2019). Thus, solitude is not simply "non-loneliness" but a distinct, positively valenced construct with its own motivational and experiential profile.

This motivational distinction is central: self-determined solitude predicts well-being, whereas non-self-determined solitude—driven by external pressures, anxiety, or withdrawal—predicts loneliness and distress (Coplan et al., 2021; Thomas & Azmitia, 2019). The Motivation for Solitude Scale (MSS-SF; Thomas & Azmitia, 2019) captures these nuances and highlights that solitude is not a unitary construct but a multidimensional experience shaped by volition. This framework aligns with Self-Determination Theory (Ryan & Deci, 2017), which posits that autonomous motivation supports psychological well-being, whereas controlled or avoidance-based motivation undermines it. Thus, solitude is not inherently beneficial or harmful—its effects depend on the motivational context and the reasons individuals choose to be alone.

Moreover, stable individual differences may help explain why some individuals find being alone distressing, whereas others find it beneficial. Cognitive models propose that lonely individuals show heightened vigilance for social threat, negative interpretation biases, and expectations of rejection (Cacioppo & Hawkley, 2009; Hawkley & Cacioppo, 2010). Loneliness also shows substantial temporal stability (Buecker et al., 2020), suggesting that personality characteristics contribute to vulnerability.

Personality functioning, defined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) Alternative Model for Personality Disorders (AMPD; American Psychiatric Association [APA], 2013), describes fundamental capacities related to Self (identity, self-direction) and Interpersonal (empathy and intimacy) functioning (Weekers et al., 2019). Impairments in these domains compromise the ability to establish and maintain satisfying interpersonal relationships and have been found to be strongly correlated with loneliness (Ernst et al., 2023).

Beyond structural functioning, maladaptive personality traits—conceptualized in the DSM-5 AMPD (APA, 2013) and in The International Statistical Classification of Diseases and Related Health Problems, Eleventh Revision (ICD-11; World Health Organization [WHO], 2019)—capture stylistic patterns of emotional, cognitive, and interpersonal functioning. These dimensional models converge on four broad domains: Negative Affectivity, Detachment, Antagonism (or Dissociality), and Disinhibition; the ICD-11 also includes Anankastia, and the AMPD includes Psychoticism (Bach et al., 2020; Kerber et al., 2022). Traits such as Detachment and Negative Affectivity are particularly relevant to loneliness. Detachment reflects social withdrawal, intimacy avoidance, and reduced capacity for pleasure in relationships, while Negative Affectivity captures emotional instability, anxiety, and pessimistic expectations of others. Both domains have been consistently linked to loneliness in empirical studies (Freilich et al., 2024; Buecker et al., 2020). In contrast, Anankastia may contribute to a preference for solitude. Its characteristic rigidity, heightened need for control, and preference for structured, predictable environments can make solitary contexts feel more manageable and less socially demanding for individuals high in this trait (Bach et al., 2020; Kerber et al., 2022). These maladaptive traits may therefore influence whether solitude is sought for intrinsic reasons or used as an avoidance strategy.

Despite growing interest in both loneliness and positive solitude, few studies have integrated these domains within a single empirical framework. Explicitly assessing both loneliness and positive solitude within the same empirical framework is essential because their simultaneous measurement allows researchers to disentangle maladaptive withdrawal from adaptive self-chosen separation, to identify differential predictors, and to avoid conflating negative affective states with beneficial regulatory strategies. Moreover, joint assessment enables the detection of mixed profiles–such as individuals who seek solitude but also experience loneliness, thereby providing a more nuanced understanding of how motivational, dispositional, and interpersonal factors interact in shaping experiences of aloneness.

Previous studies have typically examined personality functioning, maladaptive personality traits, or motivational orientation separately. By integrating these perspectives within the same analytical framework, the present study demonstrates that they explain complementary aspects of adaptive and maladaptive experiences of being alone. This dual-construct approach is increasingly recognized as necessary to advance theoretical precision and improve the ecological validity of research on social disconnection and self-regulation (Coplan et al., 2021; Thomas & Azmitia, 2019). The present study addresses this gap by examining how personality functioning, maladaptive traits, and motivational factors jointly and differentially predict loneliness and positive solitude in a large community sample.

2. Materials and methods

2.1.Procedure and Participants

The research survey was conducted online via a standardized computer-assisted web interviewing method. All self-reported instruments were presented in a randomized order. The survey also included honesty, consistency, and attention-check items. The mean completion

time was approximately 40 minutes (SD = 50 minutes), and the response rate was 51.12% of the overall sample.

Participants were recruited using snowball sampling through calls for participation on the institutional <blinded for review> website, social media posts, Meta platform ads, and leaflets with links and QR codes placed in public locations (e.g., hospitals, libraries).

The inclusion criteria were age between 18 and 64 years, native proficiency in Czech, and no history of psychosis (self-reported). Participants were excluded if they failed any of the attention, consistency, or honesty items and/or if their average completion time per item was less than three seconds. The original dataset included 1,998 cases; after applying these criteria, 262 participants were excluded, resulting in a sample of 1,736 participants. Furthermore, 11 additional cases were identified as extreme outliers and excluded from analysis (see Supplementary material for details); thus, the final analytic sample included 1,725 Czech adults.

2.2.Ethics approval

The local ethics committee of the <blinded for review> in the Czech Republic approved the study (approval number 74/23), following the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. All participants indicated informed consent before participating by clicking the dedicated button in the online form.

2.3.Measures

The *sociodemographic questionnaire* included questions on gender, age, educational level, history of mental health issues, and psychiatric treatment.

Personality functioning was assessed using the *Level of Personality Functioning Scale-Brief Form 2.0* (LPFS-BF 2.0; Doubková et al., 2025; Weekers et al., 2019), which measures impairments in self- and interpersonal functioning in line with the DSM-5 Alternative Model

for Personality Disorders (AMPD). The scale includes two subscales: *Self* (LPFS-Self; McDonald's ω = .82) and *Interpersonal* (LPFS-Interpersonal; McDonald's ω = .72)

Maladaptive personality traits were measured with the *Personality Inventory for DSM-5 – Brief Form Plus M* (PID5BF+M; Bach et al., 2020; Kerber et al., 2022; Riegel et al., 2021). The self-report instrument assesses six maladaptive trait domains: *Negative Affectivity, Detachment, Antagonism, Disinhibition, Psychoticism*, and *Anankastia*, which are compatible with both the DSM-5 AMPD and ICD-11 dimensional models. Internal consistency for the scales was acceptable (mean ω = .73, range = .67–.80) in this study.

Motivational orientations toward solitude were assessed using the *Motivation for Solitude Scale – Short Form*[1] (MSS-SF; Thomas & Azmitia, 2019). The measure differentiates between *Self-Determined Solitude* (SDS; volitional reasons for solitude, e.g., reflection, creativity) and *Non-Self-Determined Solitude* (NSDS; avoidance- or externally driven solitude, e.g., rejection, lack of alternatives). Both subscales demonstrated good internal consistency in the present sample (ω > .80; SDS = .84; NSDS = .88).

Loneliness was measured using the *UCLA Loneliness Scale* (Version 3; Russell, 1996; Vejrostová, 2011), a 20-item instrument that has been widely validated as a reliable measure of subjective feelings of loneliness and social isolation (Oshagan & Allen, 1992; Russell, 1996). Internal consistency was high (ω > .92).

Adaptive experiences of solitude were measured with the *Positive Solitude Scale*[1] (PSS; Palgi et al., 2021), which captures restorative aspects of being alone, such as self-reflection, relaxation, and autonomy. Internal consistency of PSS in this study was high (ω > .91).

[1] Scales were translated into the Czech language by authors of this article with back translation and with permission of authors of the original scales.

2.4.Statistical Analysis

All analyses were conducted in Jamovi (version 2.6.45.0; the Jamovi project, 2025). All study variables were examined using descriptive statistics. McDonald's ω was used to assess the internal consistency of the scales. Spearman's correlation coefficient (ρ) was used to assess associations between variables. Hierarchical multiple linear regression models (HLRM) were used to examine predictors of loneliness (UCLA) and positive solitude (PSS). More details in Supplementary material.

2.5.Data availability statement

The data set of the current study is available in the open data repository: https://osf.io/84d7p/overview?view_only=84f9cb7128df409d89117d15bbf50f8f

3. Results

3.1.Descriptive statistics and correlations

The final sample consisted of 1,725 Czech adults aged 18 to 64 years (M = 37.4, SD = 12.1). Regarding gender, 27.0% identified as men (*n* = 466), 71.8% as women (*n* = 1,238), and 1.2% as nonbinary (*n* = 21). Full demographic characteristics are presented in the Supplementary material (Supplementary Table S1). Table 1 shows descriptive statistics for all administered scales.

Table 1. Descriptive statistics for all measures

Variables	**N**	**M**	**SD**	**Range**	**McDonald's ω**
LPFS-Self	1725	13.9	4.53	6-24	.818
LPFS-Interpersonal	1725	12.0	3.66	6-24	.718
PID5BF+M Negative Affectivity	1725	1.18	.69	0-3	.779

PID5BF+M Detachment	1725	.95	.59	0-3	.716
PID5BF+M Antagonism	1725	.68	.51	0-3	.674
PID5BF+M Disinhibition	1725	.99	.58	0-3	.690
PID5BF+M Psychoticism	1725	1.03	.60	0-3	.715
PID5BF+M Anankastia	1725	1.04	.64	0-3	.797
MSS-SF SDS	1725	2.85	.69	1-4	.835
MSS-SF NSDS	1725	1.97	.77	1-4	.880
UCLA	1725	48.0	10.7	21-77	.922
PSS	1725	3.64	.98	1-5	.914

Note. LPFS = Level of Personality Functioning Scale-Brief Form 2.0; PID5BF+M = Personality Inventory for DSM-5 – Brief Form Plus M; MSS-SF = Motivation for Solitude Scale – Short Form; SDS = Self-Determined Solitude Scale; NSDS = Non-Self-Determined Solitude Scale; UCLA = UCLA Loneliness Scale; PSS = Positive Solitude Scale.

Spearman correlations (Supplementary Table S2) showed the expected pattern: loneliness (UCLA) was strongly associated (all p_s <.001) with impairments in personality functioning (LPFS-Self ρ = .57; LPFS-Interpersonal ρ = .60) and maladaptive traits, especially Detachment (ρ = .58) and Negative Affectivity (ρ = .47). Positive solitude (PSS) correlated strongly with SDS (ρ = .73), but the correlation with NSDS was not significant. These correlations supported the subsequent hierarchical modeling strategy.

3.2.Hierarchical Linear Regression Model for Loneliness (UCLA)

The HLRM explaining loneliness showed progressive improvements in both model fit and explained variance (see Table 2). Demographic variables (Block 1) accounted for only a small portion of the variance (Adj. R^2 = .044). Adding personality functioning (LPFS-BF 2.0) in Block 2 substantially increased explained variance to 48% (ΔAdj. R^2 = .436, p < .001).

Maladaptive personality traits (PID-5BF+M) in Block 3 added a further 9.9% (Adj. R^2 = .579, p < .001). Finally, motivational factors (MSS-SF) in Block 4 contributed an additional 4.9% (Adj. R^2 = .628, p < .001). Overall, the final model accounted for 62.8% of the variance in loneliness.

Table 2. Model fit indices and explained variance for the loneliness model

	Adj. R^2	**Δ Adj. R^2**	**AIC**	**BIC**	**Deviance**	**Residual *df***
Block 1	.044	---	4827	4865	1645	1719
Block 2	.480	+.436	3776	3825	892	1717
Block 3	.579	+.099	3420	3502	721	1711
Block 4	.628	+.049	3208	3301	636	1709

Note. Adj. R^2 = Adjusted R-squared; Δ Adj. R^2 = Change in Adjusted R-squared; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; df = Degrees of freedom. All block transitions (Δ Adj. R^2) are statistically significant at (p < .001).

Likelihood-ratio tests showed significant effects of all predictors in the final model (all p < .05). In the final model (see Table 3), NSDS (β = .295, p < .001) emerged as the strongest positive predictor of loneliness. Among the personality variables, LPFS-Interpersonal functioning (β = .243, p < .001) showed the strongest association, followed by Detachment (β = .224, p < .001), LPFS Self-functioning (β = .175, p < .001) and Negative Affectivity (β = .134, p < .001). Smaller associations were observed for Disinhibition (β = −.131, p < .001), SDS (β = −.112, p < .001), Psychoticism (β = .071, p < .001), Anankastia (β = −.040, p = .021), and Antagonism (β = −.038, p = .023).

Post hoc comparisons confirmed the trends indicated in the model. Men reported higher levels of loneliness than both women ($p_{Bonferonni}$ < .001) and nonbinary participants ($p_{Bonferonni}$ = .013). For education, only the difference between secondary and tertiary education levels remained

significant after Bonferroni correction, with people with secondary education reporting higher loneliness (p <.001). Age was significant but negligible.

The final model (Table 3) indicates that loneliness was primarily associated with NSDS (the largest effect), followed by impairments in Interpersonal and Self-functioning, and the maladaptive personality traits Detachment and Negative Affectivity. Smaller independent associations were observed for Disinhibition, Psychoticism, Anankastia, and Antagonism, whereas demographic characteristics contributed relatively little to the model.

Table 3. Results of the final HLR model with predictors of loneliness

			95% CI			
Predictors	**β**	**SE**	**LL**	**UL**	***z***	***p***
(Intercept)	.031	.033	-.034	.096	.930	.353
Age	.064	.016	.032	.096	3.908	**< .001**
Gender						
Men			(ref.)			
Women	-.108	.036	-.178	-.080	-3.010	**.003**
Nonbinary	-.439	.138	-.710	-.168	-3.177	**.002**
Education level						
Tertiary			(ref.)			
Secondary	.125	.032	.062	.187	3.915	**< .001**
Primary	.183	.099	-.011	.376	1.851	.064
LPFS-Self	.175	.022	.131	.219	7.835	**< .001**
LPFS-Interpersonal	.243	.020	.204	.281	12.457	**< .001**
PID5BF+M Negative Affectivity	.134	.021	.092	.176	6.285	**< .001**
PID5BF+M Detachement	.224	.019	.187	.260	11.976	**< .001**
PID5BF+M Antagonism	-.038	.017	-.071	-.005	-2.282	**.023**

PID5BF+M Disinhibition	-.131	.019	-.167	-.094	-6.974	**< .001**
PID5BF+M Psychoticism	.071	.018	.035	.106	3.892	**< .001**
PID5BF+M Anankastia	-.040	.018	-.075	-.006	-2.307	**.021**
MSS-SF SDS	-.112	.017	-.145	-.080	-6.747	**< .001**
MSS-SF NSDS	.295	.020	.256	.335	14.530	**< .001**

Note. LPFS = Level of Personality Functioning Scale-Brief Form 2.0; PID5BF+M = Personality Inventory for DSM-5 – Brief Form Plus M; MSS-SF = Motivation for Solitude Scale – Short Form; SDS = Self-Determined Solitude Scale; NSDS = Non-Self-Determined Solitude Scale.UCLA = UCLA Loneliness Scale; PSS = Positive Solitude Scale. β = standardized regression coefficient; SE = standard error; 95% CI = 95% confidence interval (LL = lower limit, UL = upper limit); z = z-statistic value; p = p-value; (ref.) = reference category used for dummy-coded categorical variables. Statistical significance is set at α = .05. Predictors are statistically significant if their 95% CI does not cross zero. Statistically significant associations (p < .05) are indicated in bold.

3.3.Hierarchical Linear Regression Model for Positive Solitude (PSS)

The HLR model predicting positive solitude showed a markedly different pattern from the loneliness model, with motivational factors emerging as the dominant predictors (see Table 4). Demographic variables (Block 1) explained only a trivial proportion of variance (Adj. R^2 = .037). Adding personality functioning (LPFS-BF 2.0) in Block 2 resulted in a modest improvement (Adj. R^2 = .100; ΔAdj. R^2 = .063, p < .001). Maladaptive personality traits (PID5BF+M) in Block 3 substantially increased explained variance to 22.9% (ΔAdj. R^2 = .129, p < .001). The most pronounced improvement occurred in Block 4, where motivational factors (MSS-SF) increased explained variance by an additional 37.9%. Overall, the final model accounted for 60.8% of the variance in solitude.

Table 4. Model fit indices and explained variance for the positive solitude model

	Adj. R^2	Δ Adj. R^2	AIC	BIC	Deviance	Residual *df*
Block 1	.037	---	4839	4877	1656	1719
Block 2	.100	+.063	4723	4772	1545	1717
Block 3	.229	+.129	4462	4543	1318	1711
Block 4	.608	+.379	3297	3389	669	1709

Note. Adj. R^2 = Adjusted R-squared; Δ Adj. R^2 = Change in Adjusted R-squared; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; df = Degrees of freedom. All block transitions (Δ Adj. R^2) are statistically significant at ($p < .001$).

Likelihood-ratio tests indicated that motivational factors were by far the strongest contributors to the model. In the final model (Table 5), SDS emerged as the strongest predictor of positive solitude (β = .681, $p < .001$), representing the largest associations observed across the present models. In contrast, NSDS was not a significant predictor once other variables were included (β = .013, $p = .533$).

Personality functioning and maladaptive traits played secondary but meaningful roles. Higher Negative Affectivity predicted lower positive solitude (β = −.188, $p < .001$), whereas Anankastia (β = .063, $p < .001$), Antagonism (β = .044, $p = .011$), and Detachment (β = .042, $p = .029$) showed small positive associations. LPFS-Self remained a small negative predictor (β = −.082, $p < .001$), while LPFS-Interpersonal was not significant.

Among demographic variables, only education showed a small effect: individuals with secondary education reported lower positive solitude compared to those with tertiary education ($p_{Bonferroni} = .006$). Age and gender effects were negligible.

The final model (Table 5) indicates that motivation for SDS predicted positive solitude (very large), with NSDS not contributing once other variables were controlled. Personality

functioning and traits played secondary roles (notably, lower positive solitude with higher Negative Affectivity; small positive links for Anankastia/Antagonism/Detachment).

Table 5. Results of the final HLR model with predictors of positive solitude

Predictors	**β**	**SE**	**95% CI**		**z**	**p**
			LL	**UL**		
(Intercept)	.031	.034	-.035	.098	.921	.357
Age	-.005	.017	-.038	.028	-.294	.769
Gender						
Men				(ref.)		
Women	.006	.037	-.066	.078	.159	.874
Nonbinary	.162	.142	-.116	.439	1.140	.254
Education						
Tertiary				(ref.)		
Secondary	-.101	.033	-.165	-.036	-3.076	**.002**
Primary	.031	.101	-.167	.230	.308	.758
LPFS- Self	-.082	.023	-.127	-.037	-3.579	**< .001**
LPFS-Interpersonal	-.008	.020	-.047	.031	-.403	.687
PID5BF+M Negative Affectivity	-.188	.022	-.231	-.145	-8.587	**< .001**
PID5BF+M Detachement	.042	.019	.004	.079	2.179	**.029**
PID5BF+M Antagonism	.044	.017	.010	.078	2.537	**.011**
PID5BF+M Disinhibition	-.002	.019	-.040	.035	-.128	.898
PID5BF+M Psychoticism	.031	.019	-.005	.068	1.676	.094
PID5BF+M Anankastia	.063	.018	.028	.098	3.525	**< .001**
MSS-SF SDS	.681	.017	.648	.715	39.833	**< .001**
MSS-SF NSDS	.013	.021	-.028	.054	.624	.533

Note. LPFS = Level of Personality Functioning Scale-Brief Form 2.0; PID5BF+M = Personality Inventory for DSM-5 – Brief Form Plus M; MSS-SF = Motivation for Solitude Scale

– Short Form; SDS = Self-Determined Solitude Scale; NSDS = Non-Self-Determined Solitude Scale. β = standardized regression coefficient; SE = standard error; 95% CI = 95% confidence interval (LL = lower limit, UL = upper limit); z = z-statistic value; p = p-value; (ref.) = reference category used for dummy-coded categorical variables. Statistical significance is set at α = .05. Predictors are statistically significant if their 95% CI does not cross zero. Statistically significant associations (p < .05) are indicated in bold.

3.4.Comparing Predictors of Loneliness and Positive Solitude

Comparison of the final regression models revealed markedly different patterns of associations for loneliness and positive solitude. Loneliness was primarily associated with Non-Self-Determined motivation; impairments in personality functioning, particularly Interpersonal functioning; and the maladaptive personality traits Detachment and Negative Affectivity. In contrast, positive solitude was predominantly associated with Self-Determined motivation, with personality functioning and maladaptive personality traits contributing substantially less to the final model.

Among the personality variables, Negative Affectivity was the only maladaptive trait consistently associated with both outcomes, positively associated with loneliness but negatively associated with positive solitude. In contrast, impairments in Interpersonal functioning uniquely characterized loneliness and were unrelated to positive solitude after controlling motivational orientation and maladaptive personality traits.

4. Discussion

The present study examined whether loneliness and positive solitude share similar personality and motivational correlates or represent distinct psychological experiences of being alone. Although the two constructs were moderately associated, they exhibited different patterns of association. Loneliness was primarily associated with Non-Self-Determined motivation, personality functioning impairments, and maladaptive personality traits (Detachment and

Negative Affectivity). In contrast, positive solitude was predominantly associated with Self-determined motivation, whereas personality functioning and maladaptive personality traits contributed comparatively smaller independent associations. These findings support the view that adaptive and maladaptive experiences of being alone involve partly different constellations rather than simply reflecting opposite psychological processes.

One of the most important findings concerns the role of personality functioning. Even after accounting for maladaptive personality traits and motivational orientation, impairments in personality functioning remained independently associated with loneliness, with interpersonal functioning showing one of the strongest associations. This extends previous work demonstrating that personality functioning is closely related to loneliness (Ernst et al., 2023) by showing that this association remains robust even after simultaneously accounting for maladaptive personality traits and motivations for solitude. From the AMPD perspective, impairments in identity, self-direction, empathy, and intimacy reflect structural capacities distinct from maladaptive personality traits (Weekers et al., 2019). Difficulties in these capacities may lead loneliness through their link to challenges in establishing and maintaining satisfying interpersonal relationships, consistently with cognitive models of loneliness emphasizing maladaptive social expectations, heightened sensitivity to rejection, and negative interpretation biases (Cacioppo & Hawkley, 2009; Hawkley & Cacioppo, 2010).

The findings further indicate that personality functioning and maladaptive personality traits provide complementary rather than redundant perspectives on loneliness. Detachment and Negative Affectivity have been most strongly associated with loneliness, which aligns with previous structural literature (Buecker et al., 2020; Freilich et al., 2024). The robust association of Detachment underscores that social withdrawal, intimacy avoidance, and anhedonia is strongly linked to the subjective distress of loneliness. Individuals high in Detachment may naturally distance themselves from others, yet this avoidant strategy appears closely linked to

a perceived deficiency in the quality of their social network. Crucially, impairments in interpersonal functioning remained independently associated with loneliness even after accounting for Detachment. Rather than representing competing explanations, personality functioning (structural capacity) and maladaptive traits (behavioral style) capture different levels of personality organization, providing complementary information about vulnerability to loneliness.

In contrast, positive solitude showed a markedly different pattern of associations. Self-Determined motivation emerged as by far the strongest correlate of positive solitude, whereas Non-Self-Determined motivation lost significance after adjustment. This aligns with Self-Determination Theory (Ryan & Deci, 2017), which proposes that psychological outcomes depend not only on behavior itself but also on the reasons underlying that behavior. Spending time alone does not appear inherently adaptive or maladaptive; rather, its psychological significance seems to be associated with whether solitude is experienced as personally chosen and meaningful or as externally imposed and unwanted. These findings extend previous research demonstrating beneficial associations of voluntary solitude with restoration, self-reflection, and emotional regulation (Nguyen et al., 2018; Palgi et al., 2021; Thomas & Azmitia, 2019) by showing that motivation explains substantially more variance in positive solitude than personality variables.

Importantly, LPFS-Interpersonal was not a significant predictor of positive solitude. This suggests that the capacity to derive meaning and restoration from time alone may be largely independent of how well or poorly an individual functions in relationships with others. This offers a valuable therapeutic perspective: individuals facing severe interpersonal difficulties or structural relational deficits may still develop a positive, protective relationship with themselves within solitary contexts. Developing a capacity for positive solitude does not require intact

interpersonal skills, highlighting it as an autonomous pathway toward self-regulation and resilience.

Another notable finding was the consistent role of Negative Affectivity across both outcomes. Higher Negative Affectivity was associated with greater loneliness but also with lower positive solitude. This pattern suggests that negative emotionality may represent a general vulnerability, making solitude distressing and reducing its potential restorative value. As Widiger and Oltmanns (2017) emphasize, negative affectivity/neuroticism represents a fundamental domain with pervasive clinical implications. Heightened emotional instability and chronic negative affect may be prone to negative interpretation biases that color both their social interactions (fueling loneliness) and their solitary moments (preventing restoration). Future longitudinal research is needed to determine whether Negative Affectivity represents a stable vulnerability factor or whether these associations are partly shaped by repeated experiences of loneliness and solitude.

This divergence has subtle but important implications for theory and intervention. Data suggests that personality and motivational frameworks may be relevant considerations when designing psychological interventions. This is supported by recent longitudinal evidence from inpatient psychotherapy programs showing that structural personality functioning is significantly linked to changes in loneliness over time (Kunz et al., 2026). However, given the cross-sectional nature of our data, we cannot assume specific mechanisms of direct change. Interventions addressing social disconnection might benefit from focusing on reducing non-self-determined avoidance and exploring maladaptive schemas.

Crucially, reducing a patient's loneliness (e.g., by improving interpersonal skills) does not automatically foster a capacity for positive solitude, as distinct motivational systems guide these outcomes. Pushing individuals into social situations without recognizing their autonomous need

for quiet reflection may inadvertently mirror an extraverted normativity that devalues healthy introversion. Promoting self-determined solitude should therefore be treated as a distinct therapeutic goal aimed at developing restorative, volitional aloneness rather than merely treating social deficits.

The present findings also have implications for conceptualizing and measuring loneliness and solitude. The strong association between the PSS and SDS suggests substantial conceptual proximity between the experience of positive solitude and autonomous reasons for spending time alone. However, the constructs should not be considered interchangeable. The PSS assesses the perceived benefits of positive solitude, whereas SDS captures the motivational basis for choosing to be alone. Their strong association, therefore, likely reflects shared, yet conceptually distinct, aspects of adaptive solitary experience. In contrast, the more modest association between loneliness and NSDS suggests that motivational processes represent only one component of loneliness. Together, these findings highlight that loneliness and positive solitude cannot be understood solely from motivational or behavioral indicators but should also be considered in relation to personality functioning and maladaptive personality traits. Considering these domains simultaneously may therefore provide a more comprehensive understanding of loneliness and positive solitude than focusing on a single perspective.

4.1.Limitations

Several limitations should be acknowledged when interpreting these findings. First, the cross-sectional design precludes causal inference. Although the results are consistent with theoretical models positing that personality vulnerabilities predispose individuals to loneliness, it is equally plausible that chronic loneliness exacerbates maladaptive traits or impairs personality functioning over time. Longitudinal and experimental designs are needed to clarify the directionality and potential bidirectional reinforcement of these processes.

Second, the study sample exhibits a significant gender imbalance, with women comprising 71.8% of the participants. While this overrepresentation limits the immediate generalizability of the absolute mean scores to the broader population, it is important to note that gender was systematically included as a covariate in all hierarchical regression models. The observed gender effects within the final predictive models were negligible, suggesting that the underlying patterns of personality and motivational associations operate similarly across genders despite the skewed sample composition.

Third, reliance on self-report measures introduces potential biases. Incorporating behavioral, physiological, and ecological momentary assessment methods would allow for a more nuanced understanding of how loneliness and solitude unfold in daily life.

Fourth, the study did not examine cultural factors. Cultural norms regarding autonomy, interdependence, and social expectations shape experiences of aloneness (Heu et al., 2018). What constitutes meaningful solitude in one cultural context may be experienced as isolation in another. Cross-cultural research is essential to determine the generalizability of the present findings.

Finally, the study focused specifically on positive solitude rather than solitude more broadly. Consequently, the findings should not be generalized to all forms of solitary experience.

5. Conclusion

Although loneliness and positive solitude both involve experiences of being alone, they may be characterized by markedly different patterns of personality and motivational correlates. Loneliness was associated primarily with interpersonal vulnerability and non-self-determined motivation, whereas positive solitude was associated predominantly with autonomous motivation. By examining personality functioning, maladaptive personality traits, and motivational orientation within a single analytical framework, the present study demonstrates

that these domains capture complementary aspects of adaptive and maladaptive experiences of being alone. These findings support an integrative perspective in which personality functioning, maladaptive personality traits, and motivational orientation represent complementary levels of explanation for adaptive and maladaptive experiences of being alone.

References

American Psychiatric Association. (2013). Alternative DSM-5 model for personality disorders. In *Diagnostic and Statistical Manual of Mental Disorders* (5th ed., pp. 761–781).

Bach, B., Kerber, A., Aluja, A., et al. (2020). International Assessment of DSM-5 and ICD-11 Personality Disorder Traits: Toward a Common Nosology in DSM-5.1. *Psychopathology*, *53*(3-4), 179–188. https://doi.org/10.1159/000507589

Bateman, A., & Fonagy, P. (2010). Mentalization-based treatment for borderline personality disorder. *World psychiatry: official journal of the World Psychiatric Association (WPA)*, *9*(1), 11–15. https://doi.org/10.1002/j.2051-5545.2010.tb00255.x

Buecker, S., Maes, M., Denissen, J. J. A., & Luhmann, M. (2020). Loneliness and the Big Five personality traits: A meta-analysis. *European Journal of Personality, 34*(1), 8–28. https://doi.org/10.1002/per.2229

Buecker, S., Mund, M., Chwastek, S., Sostmann, M., & Luhmann, M. (2021). Is loneliness in emerging adults increasing over time? A preregistered cross-temporal meta-analysis and systematic review. *Psychological Bulletin*, *147*(8), 787–805. https://doi.org/10.1037/bul0000332

Cacioppo, J. T., & Hawkley, L. C. (2009). Perceived social isolation and cognition. *Trends in cognitive sciences*, *13*(10), 447–454. https://doi.org/10.1016/j.tics.2009.06.005

Clarkin, J. F., Foelsch, P. A., Levy, K. N., Hull, J. W., Delaney, J. C., & Kernberg, O. F. (2001). The development of a psychodynamic treatment for patients with borderline personality disorder: a preliminary study of behavioral change. *Journal of Personality Disorders*, *15*(6), 487–495. https://doi.org/10.1521/pedi.15.6.487.19190

Coplan, R. J., Ooi, L. L., & Baldwin, D. (2021). *Motivations for solitude: Developmental origins and implications*. In R. J. Coplan, J. C. Bowker, & L. J. Nelson (Eds.), The handbook of solitude: Psychological perspectives on social isolation, social withdrawal, and being alone (2nd ed., pp. 151–167). Wiley-Blackwell.

de Jong-Gierveld, J., & van Tilburg, T. G. (2006). A 6-item scale for overall, emotional, and social loneliness: Confirmatory tests on survey data. Research on Aging, 28(5), 582-598. https://doi.org/10.1177/0164027506289723

Doubková, N., Heissler, R., Diondet, S., Hájková, A., Preiss, M., & Rossi, G. (2025). Measurement Invariance of the Level of Personality Functioning Scale-Brief Form 2.0 in Treatment-Seeking and Non-treatment-Seeking Groups. Journal of Personality Disorders, 39(6), 502–525. https://doi.org/10.1521/pedi.2025.39.6.502

Ernst, M., Brähler, E., Kruse, J., Kampling, H., & Beutel, M. E. (2023). Does loneliness lie within? Personality functioning shapes loneliness and mental distress in a representative population sample. *Journal of Affective Disorders Reports, 12,* Article 100486. https://doi.org/10.1016/j.jadr.2023.100486.

Freilich, C. D., McGue, M., South, S. C., Roisman, G. I., & Krueger, R. F. (2024). Connecting loneliness with pathological personality traits: Evidence for genetic and

environmental mediation from a study of older twins. *Personality Disorders, 15*(1), 34–45. https://doi.org/10.1037/per0000635

Hawkley, L. C., & Cacioppo, J. T. (2010). Loneliness matters: a theoretical and empirical review of consequences and mechanisms. *Annals of behavioral medicine: a publication of the Society of Behavioral Medicine*, *40*(2), 218–227. https://doi.org/10.1007/s12160-010-9210-8

Heu, L. C., van Zomeren, M., & Hansen, N. (2019). Lonely Alone or Lonely Together? A Cultural-Psychological Examination of Individualism-Collectivism and Loneliness in Five European Countries. *Personality & social psychology bulletin*, *45*(5), 780–793. https://doi.org/10.1177/0146167218796793

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspectives on psychological science: a journal of the Association for Psychological Science*, *10*(2), 227–237. https://doi.org/10.1177/1745691614568352

Jeste, D. V., Lee, E. E., & Cacioppo, S. (2020). Battling the Modern Behavioral Epidemic of Loneliness: Suggestions for Research and Interventions. *JAMA psychiatry*, *77*(6), 553–554. https://doi.org/10.1001/jamapsychiatry.2020.0027

Kerber, A., Schultze, M., Müller, S., Rühling, R. M., Wright, A. G. C., Spitzer, C., Krueger, R. F., Knaevelsrud, C., & Zimmermann, J. (2022). Development of a Short and ICD-11 Compatible Measure for *DSM-5* Maladaptive Personality Traits Using Ant Colony Optimization Algorithms. *Assessment*, *29*(3), 467–487. https://doi.org/10.1177/1073191120971848

Kunz, J. I., Barton, B. B., Wolfrum, N., Wolf, J., Merz, K., Musil, R., Goerigk, S., Jobst, A., Bertsch, K., Padberg, F., & Reinhard, M. A. (2026). Loneliness and Its Associations With

Personality Functioning: Evidence From Longitudinal Inpatient Psychotherapy Programs in Germany. *Annals of the New York Academy of Sciences, 1556*(1), e70215. https://doi.org/10.1111/nyas.70215

Long, C.R., & Averill, J.R. (2003). Solitude: An Exploration of Benefits of Being Alone. *Journal for The Theory of Social Behaviour, 33*, 21-44. https://doi.org/10.1111/1468-5914.00204

Nguyen, T. T., Ryan, R. M., & Deci, E. L. (2018). Solitude as an Approach to Affective Self-Regulation. *Personality & social psychology bulletin*, *44*(1), 92–106. https://doi.org/10.1177/0146167217733073

Ortiz-Ospina, E., & Roser, M. (2019). Is there a loneliness epidemic? *Our World in Data*. Available at: https://ourworldindata.org/loneliness-epidemic

Oshagan, H., & Allen, R. L. (1992). Three loneliness scales: an assessment of their measurement properties. *Journal of Personality Assessment*, *59*(2), 380–409. https://doi.org/10.1207/s15327752jpa5902_13

Palgi, Y., Segel-Karpas, D., Ost Mor, S., Hoffman, Y., Shrira, A., & Bodner, E. (2021). Positive solitude scale: Theoretical background, development and validation. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being, 22*(8), 3357–3384. https://doi.org/10.1007/s10902-021-00367-4

Riegel, K. D., Ksinan, A. J., & Schlosserova, L. (2021). Psychometric Properties of the Independent 36-Item PID5BF+M for ICD-11 in the Czech-Speaking Community Sample. *Frontiers in psychiatry*, *12*, 643270. https://doi.org/10.3389/fpsyt.2021.643270

Russell D. W. (1996). UCLA Loneliness Scale (Version 3): reliability, validity, and factor structure. *Journal of Personality Assessment*, *66*(1), 20–40. https://doi.org/10.1207/s15327752jpa6601_2

Ryan, R. M., & Deci, E. L. (2017). *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness.* New York: Guilford Press.

Shevlin, M., Murphy, S., & Murphy, J. (2015). The latent structure of loneliness: testing competing factor models of the UCLA Loneliness Scale in a large adolescent sample. *Assessment*, *22*(2), 208–215. https://doi.org/10.1177/1073191114542596

Thomas, V., & Azmitia, M. (2019). Motivation matters: Development and validation of the Motivation for Solitude Scale - Short Form (MSS-SF). *Journal of Adolescence*, *70*, 33–42. https://doi.org/10.1016/j.adolescence.2018.11.004

The Jamovi project. (2025). Jamovi (Version 2.6) [Software]. https://www.jamovi.org

Vanhalst, J., Soenens, B., Luyckx, K., Van Petegem, S., Weeks, M. S., & Asher, S. R. (2015). Why do the lonely stay lonely? Chronically lonely adolescents' attributions and emotions in situations of social inclusion and exclusion. *Journal of Personality and Social Psychology, 109*(5), 932–948. https://doi.org/10.1037/pspp0000051

Vejrostová, A. (2011). *Souvislost mezi rodičovským konfliktem a romantickými vztahy v pozdní adolescenci: strach z intimity a osamělost* [Bachelor's thesis, Masaryk University]. Available at: https://is.muni.cz/th/ajthu/.

Weekers, L. C., Hutsebaut, J., & Kamphuis, J. H. (2019). The Level of Personality Functioning Scale-Brief Form 2.0: Update of a brief instrument for assessing level of

personality functioning. *Personality and mental health*, *13*(1), 3–14. https://doi.org/10.1002/pmh.1434

Widiger, T.A. & Oltmanns, J.R. (2017). Neuroticism is a fundamental domain of personality with enormous public health implications. *World Psychiatry, 16*, 144-145. https://doi.org/10.1002/wps.20411

World Health Organization. (2019). *International statistical classification of diseases and related health problems* (11th ed.). https://icd.who.int/

Wright, A. G. C., Thomas, K. M., Hopwood, C. J., Markon, K. E., Pincus, A. L., & Krueger, R. F. (2012). The hierarchical structure of DSM-5 pathological personality traits. *Journal of Abnormal Psychology, 121*(4), 951–957. https://doi.org/10.1037/a0027669

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- 3.Supplementarymaterial.docx