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The brief scale of existential loneliness: scale development and psychometric evaluation

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Abstract
Loneliness is a common and distressing experience which has an existential dimension. Existential loneliness is understudied and a brief, valid measure which is grounded in experiences of the phenomenon and captures its distressing nature is needed. This study therefore developed the Brief Scale of Existential Loneliness. Scale items were developed based on a literature review and qualitative inquiry. Potential items were reviewed by academic experts, experts by experience, and potential participants for relevance and clarity. Scale structure was assessed through exploratory and confirmatory factor analysis with 714 participants (17–84 years old, $M = 42.25$, $SD = 20.22$) and reliability and validity were investigated. Tests of dimensionality revealed a 6-item unidimensional scale. The scale possesses high internal consistency and construct validity. Consistent with predictions, scale scores are negatively correlated with meaning in life and positively correlated with loneliness (broadly defined), poor mental health, emptiness, and related constructs. The Brief Scale of Existential Loneliness is a short, valid, and reliable measure of existential loneliness which may be usefully employed alongside measures of other loneliness dimensions.

Keywords Existential loneliness · Loneliness · Scale Development · Measurement · Individual differences · Emotions

Introduction

Existential loneliness refers to a type of loneliness that arises due to our fundamental separation from other people: there is an impassable gap between other people's thoughts, feelings, and experiences and our own. Traditionally, existential loneliness was defined by Moustakas as an "intrinsic and organic reality of human life" (1961, p. 46), a painful, desolate experience in which a person is fully aware of themselves as a solitary individual. In attempting to clarify the concept through reviewing theoretical and empirical studies, Bolmsjö and colleagues (2019) more recently came to define existential loneliness through two characteristics: the perception of oneself as inherently separated from other people and the universe, and the emotional aspects that come alongside that feeling such as isolation, emptiness, alienation, and abandonment. It has been described as a universal phenomenon (Mayers & Svartberg, 2001) which may emerge in adolescence due to increased self-consciousness and awareness of the self as a separate being. This is concerning given that broad conceptualisations of loneliness have shown that it is associated with poor physical and mental health outcomes (Groarke et al., 2021; Lim et al., 2016; Luanaigh & Lawlor, 2008) and has been described by some as a public health crisis (Holt-Lunstad, 2021).

There is a growing recognition that existential loneliness is a facet of the loneliness experience which has been overlooked in existing research (Maes et al., 2022; Victor et al., 2022). It may represent a broader, more pervasive form of loneliness in comparison to other dimensions of loneliness which relate to perceived deficits in specific types of relationships (McKenna-Plumley et al., 2023); the deep feeling of aloneness stems from a sense of essential disconnection from others, or even from the world and from meaning. While qualitative research has examined existential loneliness, particularly in older and seriously ill adults (Carr &

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Fang, 2021; Larsson et al., 2019; Sand & Strang, 2006; Sjöberg et al., 2019), relatively little quantitative research has focused on existential loneliness.

The dearth of quantitative investigation into the existential dimension of loneliness may be due to the lack of a brief, construct-specific measurement instrument. While adjacent scales exist, they are limited for use in loneliness research by their length and lack of focus on subjective, aversive elements of the experience. The Existential Loneliness Questionnaire (Mayers et al., 2002) is internally consistent and contains 22 items, three of which refer to HIV status as it was developed for use with women with HIV (e.g., "*Because I am HIV + I feel hopeless about having a romantic relationship"*). Some items appear to be general, rather than specific to existential loneliness (e.g., *"When I feel lonely*, *I do whatever I can not to think about those feelings"*). The scale was validated in a small sample and factor analysis was therefore not possible, but translations of the scale using portions of the items have suggested a multidimensional factor structure (Gökdemir-Bulut & Bozo, 2018; van Tilburg, 2021). The Belcher Extended Loneliness Scale (Belcher, 1973) is a seldom-used 60-item measure with 8 items comprising an existential loneliness factor; the scale has been criticised for its length, complexity, and inaccessibility of materials (Scalise et al., 1984; as cited in Solano, 1980). Moreover, the items focus on purpose and life outlook, without reference to one's relationship with others (e.g., *"Almost everyone has a good chance of leading a happy and useful life"*). The Existential Isolation Scale (Pinel et al., 2017) includes six items measuring the extent to which others share the respondent's experiences of the world. The scale shows good internal consistency and test-retest reliability over two weeks; however, its focus on the perception of shared experiences (e.g., *"People often have the same "take" or perspective on things that I do"*) may not capture other aspects of existential loneliness, such as perceived disconnection from others, or negatively valent affective aspects of loneliness which have been indicated by scholarly writing and qualitative literature (Carr & Fang, 2021; Garnow et al., 2022; Hemberg et al., 2021; McKenna-Plumley et al., 2023; Moustakas, 1961; Yalom, 1980). Recently, the Existential Loneliness Scale was developed to assess existential loneliness based on its characteristics, causes, correlates, and situations when it arises (Hadeei, 2023). The scale has good internal consistency and test-retest reliability but is limited for widespread use by its length (19 items), inclusion of complex items (e.g., *"Man comes into the world alone*, *lives in the world alone and finally*, *leaves it alone too. It seems that man is condemned to be alone"*), and items which tap correlates of existential loneliness rather than the core construct. Finally, the Existential Concerns Questionnaire (van Bruggen et al., 2017) contains 22 items, 3 of which measure existential isolation as part of existential anxiety (e.g., *"The awareness that other people will never know me at the deepest level frightens me"*). Of these measures, none appear to have been generated based on qualitative exploration of the construct, which is a recommended part of scale development to inform domains and items to be included (Carpenter, 2018; DeVellis, 2017). Moreover, almost all of the scales used Principal Components Analysis to identify factor structure despite its inappropriateness for this purpose (Fabrigar et al., 1999); an exception is the Existential Isolation Scale which used a more appropriate factor identification method. Table 1 presents a summary of the structure and psychometric properties of these measures. It appears that there is the need for a brief, rigorous measure of existential loneliness that is based on experiences of this subjective phenomenon and captures the distressing nature of loneliness.

Loneliness is generally measured using 3- or 4-item versions of the UCLA Loneliness Scale (Hughes et al., 2004; Russell et al., 1980), single-item direct questions such as *"How often do you feel lonely?"* (e.g., Office for National Statistics, 2018), or the 6-item de Jong Gierveld Loneliness Scale to assess social and emotional dimensions of loneliness (de Jong Gierveld & van Tilburg, 2006). Loneliness is frequently conceptualised as including social, emotional, and existential dimensions (Campaign to End Loneliness, 2023; Mansfield et al., 2019; Willis et al., 2022) and these different dimensions of loneliness have distinct correlates and consequences (DiTommaso & Spinner, 1997; Green et al., 2001; Robyn Cole et al., 2023). A short scale of existential loneliness that will enable the measurement of this dimension alongside social and emotional dimensions is therefore greatly needed. Research using the Existential Loneliness Questionnaire indicates that existential loneliness is associated with depression, lack of purpose in life, hopelessness, and suicidal ideation (Gökdemir-Bulut & Bozo, 2018; Mayers et al., 2002) and the Existential Isolation Scale shows associations with insecure attachment, having a minority identity, and being a man (Helm et al., 2018, 2020; Pinel et al., 2022), suggesting that this construct is deserving of further attention in the loneliness literature. This may be particularly important to delineate whether existential loneliness has the same deleterious impacts on health and mortality that have been evidenced for other dimensions of loneliness (O'Súilleabháin et al., 2019; Qualter et al., 2013). More attention should be paid to identifying specific outcomes of existential loneliness, which may be less tied to objective social network characteristics given that it is a broad feeling of disconnection from others which may involve a sense of separation from the world, oneself, and meaning. While qualitative work is necessary to understand the depth and range of these subjective experiences,

Table 1 Psychometric properties of measures of existential loneliness and related constructs

Measure	Concept of Interest	Item Development	Item Wording	Number of Items	Response Format	Sample	Factor Analysis	Factor Structure
Belcher Extended Loneliness Scale (Belcher, 1973)	Loneliness	• 66 items and four incomplete sentences initially generated • Based on combining different scales and items to represent psychological and sociological aspects of loneliness	Personal statements (e.g., "I feel like I am worthless.")	60 (8 measuring existential loneliness)	1–6 Likert scale (59 items: 1 = Rarely or almost never true; 6 = True all or most of time; 1 item: 1 = Least lonely; 6 = Most lonely)	442 undergraduate students (N = 371 of which were included in factor analysis)	• Principal components analysis • Varimax rotation	8 factors: Pathological Loneliness (28 items), Alienation (18 items), Loneliness anxiety (5 items), Existential loneliness (8 items), Estrangement (10 items), Anomie (12 items), Loneliness depression (4 items), Separateness (2 items)
Existential Loneliness Questionnaire (Mayers et al., 2002)	Existential loneliness	• 40 items initially generated • Items based on clinical work with women with HIV, review of theory, and discussion with colleagues	Personal statements (e.g., "I am happy with the way I have lived my life.")	22	1–6 Likert scale (1 = Not at all true of me; 6 = Very much true of me)	47 women with HIV	• Factor analysis could not be carried out due to small sample size • Rasch analysed using the partial credit model	Factor analysis not carried out[a]
Existential Loneliness Scale (Hadeei, 2023)	Existential loneliness	• 40 items initially generated • Items based on literature review, existing qualitative studies, and existing scales	Personal statements (e.g. "I feel isolated from other people.")	19	1–5 Likert scale (1 = Never true; 5 = Always true)	433 adults	• Principal component analysis, parallel analysis, and the Closeness to Unidimensionality test • CFA	1 factor

Table 1 (continued)

Measure	Concept of Interest	Item Development	Item Wording	Number of Items	Response Format	Sample	Factor Analysis	Factor Structure
Existential Isolation Scale (Pinel et al., 2017)	Existential isolation	• 44 items initially generated • 22 items generated to centre around the extent to which people share the respondent's experiences	Personal statements (e.g., "I usually feel like people share my outlook on life.")	6	0–9 Likert scale (0 = Strongly disagree; 9 = Strongly agree)	$N = 347$ (Study 1), $N = 576$ (Study 2), and $N = 248$ (Study 3) university students	Sample 1: • Principal axis factor analysis • Varimax rotation Sample 2: • CFA	1 factor: Existential isolation
Existential Concerns Questionnaire (van Bruggen et al., 2017)	Existential anxiety	• 60 items initially generated • Reduced to 25 items through cognitive interviewing (van Bruggen, 2018) • Items generated around five theoretical domains to extend the Existential Anxiety Questionnaire (Weems et al., 2004): death, meaninglessness, guilt, identity, and social isolation	Personal statements (e.g., "The awareness that other people will never know me at the deepest level frightens me.")	22 (3 items measuring isolation)	5-point frequency scale (Never–Always)	488 adults ($N = 99$ of whom were a clinical sample with anxiety and/or depressive disorders)	• Principal component analysis • Oblimin rotation • CFA	1 factor

[a] Studies analysing the factor structure of modified versions of the ELQ have suggested three (Gökdemir-Bulut & Bozo, 2018) and two (van Tilburg, 2021) factors

quantitative work with an appropriate instrument is important to uncover aspects such as prevalence in different age groups, risk factors and individual differences, and intervention efficacy. This study aims to provide such an instrument which is grounded in lived experiences of existential loneliness across the lifespan.

Based on existing literature and qualitative work (McKenna-Plumley et al., 2023), our core definition of existential loneliness was *a negatively valent feeling of profound aloneness and separation from other people*. A literature review and in-depth qualitative work (McKenna-Plumley et al., 2023) established that this involves a generally negative experience stemming from an awareness or feeling that one is fundamentally alone in terms of being separate and disconnected from others, and in some cases from the world or oneself, which may be characterised by feelings of sadness, emptiness, lack of shared understanding with others, and lack of meaning. Following from this comprehensive understanding of existential loneliness experiences, this study aimed to produce a brief, valid, and reliable scale of existential loneliness, named the Brief Scale of Existential Loneliness (BSEL).

We aimed to establish content validity by gathering expert feedback on potential scale items and assess reliability by measuring internal consistency. Additionally, to confirm concurrent validity, we expected to observe a positive correlation with another, although conceptually distinct, measure of existential loneliness (the ELQ; Mayers et al., 2002). To establish convergent validity, we assessed correlations with measures of general loneliness, existential isolation, meaning in life, emptiness, mental health, and experience of boundary situations. A positive correlation was expected with general loneliness (because the scale measures a form of loneliness), existential isolation (as awareness of existential isolation should potentially give rise to existential loneliness), boundary situations (which are suggested to provoke existential loneliness; Mayers et al., 2002; Moustakas, 1961), emptiness (which was found to characterise existential loneliness; McKenna-Plumley et al., 2023), and poor mental health (which is implicated in experiences of existential loneliness; Bolmsjö et al., 2019; McKenna-Plumley et al., 2023; Nyström et al., 2002). A negative correlation was expected with presence of meaning in life (as existential loneliness involves a lack of meaning; Sjöberg et al., 2019). Furthermore, we assessed known-groups validity, where significant differences in BSEL scores were expected between individuals who had and had not experienced boundary situations and between individuals experiencing frequent and infrequent bad mental health days.

Method

Design

This study follows DeVellis' (2017) best practice guidelines for scale development. The scale development process involved two phases: an initial phase of item generation,

exploratory factor analysis (EFA), and item pool reduction, and a second phase involving confirmatory factor analysis (CFA) to confirm the factor structure suggested by the EFA and an examination of validity and reliability. The study was performed in line with the principles of the Declaration of Helsinki and received ethical approval from the Faculty of Engineering and Physical Sciences at Queen's University Belfast. The study methods and analysis plan were preregistered; alterations from this plan are reported alongside the preregistration (see Data Availability Statement).

Initial scale development

Item generation

Item generation followed scale development guidelines from DeVellis (2017). Fifty-five initial items were generated around our construct definition of existential loneliness which was derived from an extensive literature review and qualitative survey (McKenna-Plumley et al., 2023). These initial items were organised into broad domains of: feeling of utter aloneness, feeling separated from all other people, lack of shared understanding, lack of meaning/purpose, sadness, emptiness, and feeling of not fitting in/belonging.

Content validity

Academic and lived experience experts were recruited to assess the relevance, clarity, and thoroughness of the items and overall item pool. This was done to ensure that the item pool included appropriate content covering all aspects of existential loneliness. There were four academic experts with content expertise in loneliness, existential psychology, and psychometrics and two experts by experience who identified as having experienced and worked with individuals experiencing existential loneliness. These content experts responded to an online questionnaire ranking the relevance and clarity of the 55 initial items and provided written feedback on the items and overall item pool. The experts made several suggestions, for example related to relevant domains of existential loneliness, the appropriateness of different negatively valent stems, and item phrasing. In line with this feedback, 18 explicitly negatively valent items (e.g., *"I have the upsetting feeling that I am separate from everyone else"*) and 18 implicitly negatively valent items (e.g., *"I feel separate from everyone else"*) were retained and further developed around the core definition of the experience of existential loneliness as *a negatively valent feeling of fundamental aloneness and separation from other people*. Specifically, these items aimed to tap into feelings of aloneness, separation, and disconnection from others. Eight of these items were taken directly from the original set of items presented to content experts, eight were edited, and twenty were newly developed based on content expert feedback.

Pilot testing

Seven potential participants (4 women, 3 men; 20–58 years, $M = 35.14$, $SD = 12.48$) completed the refined pool of 36 items in a pilot test. These participants were recruited from researchers' networks in the UK, Ireland, and USA. Participants indicated whether they could understand each item; 30 items were unanimously rated as very or quite clear. While participants rated the items highly, in free-text responses they reported that some adjectives (e.g., "ultimately", "upsetting") were more ambiguous and harder to respond to. However, given the positive ratings of comprehensibility, all 30 items unanimously rated as very or quite clear were retained for factor analysis to assess which had the highest psychometric quality.

Further scale development

Procedure

Data were collected through an online survey of adults aged 16 and over in the UK and Ireland. Participants were recruited via social media (e.g., Twitter, Reddit), posters placed around the university campus, emails to relevant organisations, research participation systems at Queen's University Belfast and the University of Galway, and Prolific. Participants recruited from Prolific received compensation (approximately £1–2) for completion of the survey. After providing informed consent, participants completed an online survey hosted on Qualtrics, which included additional measures for a related study. The presentation order of the scales was randomised following the presentation of the information sheet, consent form, sociodemographic questions, and items being tested for the new scale.

Measures

Brief Scale of Existential Loneliness potential items Respondents completed 30 items on a 5-point Likert scale ranging from 1 to 5 (1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly Agree) to be tested for inclusion in the new scale. The scale instructions read: "Please indicate the extent to which you agree or disagree with the following statements". Item scores were averaged to calculate the scale score.

Sociodemographic variables Participants were asked to report a range of socio-demographic variables (e.g., gender,

country, ethnicity, education, employment status, relationship status).

General loneliness The 3-item version of the UCLA Loneliness Scale (Hughes et al., 2004) is a valid and reliable measure of loneliness frequency, including items such as *"How often do you feel that you lack companionship?"*. Cronbach's alpha indicated good reliability in the present sample (α = 0.84). A direct question on loneliness adapted from van Tilburg (2021) was also used (*"We are interested in people's feelings of loneliness. If we were describing people as 'not lonely', 'moderately lonely', 'strongly lonely', or 'very strongly lonely', how would you describe yourself?"*).

Existential loneliness The Existential Loneliness Questionnaire (Mayers et al., 2002) aims to measure existential loneliness in HIV-positive patients through 22 items. Items were edited to remove references to HIV (e.g., *"Since being diagnosed with HIV I have had trouble finding people I can talk to"* was changed to *"I have had trouble finding people I can talk to"*). The scale appears to measure aspects of existential loneliness and has items which may tap into related constructs including general loneliness (e.g., *"Important relationships have ended or become weaker"*) and social support (e.g., *"I feel I have people I can trust and rely on if I need them"*). Cronbach's alpha indicated excellent reliability in the present sample (α = 0.93).

Existential isolation The Existential Isolation Scale (Pinel et al., 2017) includes six items measuring awareness of existential isolation in terms of the degree to which respondents feel that other people share their experiences. Cronbach's alpha indicated excellent reliability in the present sample (α = 0.90).

Boundary situations A bespoke question assessed whether the respondent had experienced a boundary situation (an urgent experience which confronts a person with existential concerns): *"Have you ever had an urgent experience (for example, an extreme experience related to death, illness, pain, or guilt) that significantly changed your perspective on life?"*.

Meaning in life The Meaning in Life Questionnaire (Steger et al., 2006) measures meaning through ten items. The 5-item Presence subscale was used, including items such as *"I understand my life's meaning"*; Cronbach's alpha indicated good reliability of the subscale in the present sample (α = 0.89).

Emptiness The Subjective Emptiness Scale (Price et al., 2022) measures feelings of emptiness through five items, e.g., *"I feel empty inside"*; Cronbach's alpha indicated excellent reliability in the present sample (α = 0.92).

Mental health One item from the Centers for Disease Control and Prevention Healthy Days Core Module (CDC HRQOL-4; Centers for Disease Control and Prevention, 1993) measures the frequency of poor mental health over the prior month *("Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"*).

Statistical analysis

870 people accessed the survey (338 via Prolific and 532 from other recruitment sources). Ten participants were ineligible due to living outside the UK or Ireland and 7 participants failed an attention check. 714 participants completed the survey; all other data was missing due to attrition. Data imputation techniques were not deemed suitable as those available in SPSS are less appropriate when more than 5–10% of data is missing and up to 15.98% was missing from certain scales in the current study (Enders, 2001; Scheffer, 2002), and Little's Missing Completely at Random test (Little, 1988) was significant, indicating that data were not missing at random. A complete cases analysis approach was therefore adopted.

Factor retention decisions for EFA were made based on the Kaiser criterion (Kaiser, 1960), visual analysis of the Scree plot (Cattell, 1966), Horn's parallel analysis (Horn, 1965), proportion of variance explained (Beavers et al., 2013), and conceptual considerations. In line with best practice, items would be retained if their loadings were above 0.40, item communalities were over 0.40, and they had no cross-loadings above 0.32 (Worthington & Whittaker, 2006).

Model fit in CFA was assessed using several indices: the Chi-square test, normed Chi-square index (Q value), comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA). Non-significant χ^2, Q values from 2 to 5, and CFI and TLI greater than 0.90 indicate good model fit, while RMSEA values between 0.05 and 0.09 indicate adequate fit and below 0.05 indicate very good fit (Hu & Bentler, 1999; Kenny & McCoach, 2003). The standardized root mean squared residual (SRMR) was also assessed, where values below 0.08 indicate good fit (Hu & Bentler, 1999). However, as large sample sizes often lead to significant Chi-square tests (Bentler & Bonett, 1980), the other indices were weighted more heavily. Hair and colleagues (2006) suggest that factor loadings should ideally be over 0.7.

The analysis was conducted on the 714 participants for whom complete data was available. This sample was randomly divided in two to determine the factor structure and reliability of the scale; EFA was performed on one half ($N = 379$) and CFA was performed on the other half ($N = 335$). This satisfied sample size recommendations for factor analysis which suggest a range of 5–10 participants per item (150–300 participants, in our case; Gorsuch, 1983) or a sample size over 300 participants (Worthington & Whittaker, 2006).

Construct validity & reliability

Validated scales and bespoke questions were included to assess construct validity, the degree to which the item pool related to other measures and constructs as expected based on theory (Carmines & Zeller, 1979). Convergent validity was assessed through correlations with measures of general loneliness, existential isolation, meaning in life, emptiness, mental health, experience of boundary situations, and meaning in life. Concurrent validity was assessed through correlations with the ELQ (Mayers et al., 2002). Known-groups validity was assessed through independent t-tests comparing scores between individuals experiencing frequent and infrequent bad mental health days and individuals who had and had not experienced boundary situations.

Reliability was assessed via Cronbach's alpha and McDonald's omega, where values over 0.70 indicate acceptable reliability (Nunnally, 1978).

Participants

714 participants completed the online survey. Participants ranged from 17 to 84 years old ($M = 42.25$, $SD = 20.22$) and the majority (were women ($N = 427$, 59.8%) and White ($N = 664$, 93%). 338 (47.3%) participants were recruited via Prolific. There were some significant demographic differences between participants drawn from Prolific and other sources (for example, more men and older adults were selectively recruited from Prolific). Participants were randomly divided into two groups, with approximately half ($N = 379$, age range = 18–81 years, $M = 42.23$, $SD = 20.09$) constituting the development sample and half ($N = 335$, age range = 17–84 years, $M = 42.27$, $SD = 20.40$) constituting the confirmatory sample. Full sample demographics are presented in Table 2.

Results

Dimensionality

Exploratory factor analysis

Exploratory factor analysis (EFA) with principal axis factoring was carried out using SPSS version 29 on the development sample ($N = 379$). It was expected that any existential loneliness factors would correlate with one another and an oblique rotation (direct oblimin) with Kaiser normalisation was therefore used. A Kaiser Meyer-Olkin measure value over 0.6 (KMO = 0.98) and significant Bartlett's test of sphericity ($\chi^2(435) = 14235.81$, $p < .001$) indicated that the data were suitable for factor analysis.

Factor analysis and item deletion were carried out iteratively with repeated analysis being run with the poorest item (according to the above criteria) removed each time (Worthington & Whittaker, 2006). Parallel analysis consistently overestimated the number of factors relative to the Kaiser criterion and Scree plot, which suggested between one and three factors with the majority of variance explained by one factor; this solution was more parsimonious and conceptually coherent and therefore the Kaiser criterion and Scree plot were followed. Due to generally high item loadings, a more conservative cut-off of 0.71 and over was applied (Comrey & Lee, 1992).

Principal axis factoring of the 30-item dataset extracted three factors accounting for 77.17% of the variance. Seventeen items were iteratively deleted as they did not meet the item retention criteria. The remaining 13 items created a two-factor solution accounting for 78.20% of the variance. Given the aim to create a brief scale and the conceptual and wording similarity in certain items, several items were then eliminated to minimise overlap and create a parsimonious solution. From the 13 items meeting the retention criteria, six were deleted at this phase. This created a seven-item, one-factor scale explaining 71.21% of the variance. All items had strong psychometric properties in line with the criteria described above.

Confirmatory factor analysis

Confirmatory factor analysis (CFA) was carried out on the confirmatory sample ($N = 335$). One item of the 7-item one-factor scale identified by EFA failed to load above 0.71 and was therefore removed (*"I lack a true connection with another person"*, which loaded at 0.66). The initial model of the resulting 6-item scale did not satisfy Chi-square, normed Chi-square index, or RMSEA criteria: $\chi^2(9) = 99.80$, $p < .001$, $Q = 11.09$, TLI = 0.92, CFI = 0.95, RMSEA = 0.17 (90% CI, 0.14–0.21), SRMR = 0.043. Modification indices suggested

Table 2 Sample demographics of the total, development, and confirmatory samples

Variable	Total Sample	Development Sample	Confirmatory sample
N (%)	714 (100%)	379 (53.08%)	335 (46.92%)
Age			
16–29	263 (36.8%)	138 (36.4%)	125 (37.3%)
30–59	223 (31.2%)	118 (31.1%)	105 (31.3%)
60+	228 (31.9%)	123 (32.5%)	105 (31.3%)
Gender			
Woman	427 (59.8%)	230 (60.7%)	197 (58.8%)
Man	270 (37.8%)	142 (37.5%)	128 (38.2%)
Other gender	13 (1.8%)	5 (1.3%)	8 (2.4%)
Country			
England	334 (46.8%)	184 (48.5%)	150 (44.8%)
Northern Ireland	218 (30.5%)	105 (27.7%)	113 (33.7%)
Republic of Ireland	105 (14.7%)	60 (15.8%)	45 (13.4%)
Scotland	32 (4.5%)	18 (4.7%)	14 (4.2%)
Wales	20 (2.8%)	9 (2.4%)	11 (3.3%)
UK (Other)	5 (0.7%)	3 (0.8%)	2 (0.6%)
Ethnicity			
White	664 (93%)	346 (91.3%)	318 (94.9%)
South Asian	15 (2.1%)	10 (2.6%)	5 (1.5%)
Black	9 (1.3%)	7 (1.8%)	2 (0.6%)
East Asian	8 (1.1%)	5 (1.3%)	3 (0.9%)
Other ethnicity	6 (0.8%)	3 (0.8%)	3 (0.9%)
Latino/Hispanic	5 (0.7%)	2 (0.5%)	3 (0.9%)
Mixed ethnicity	5 (0.7%)	4 (1.1%)	1 (0.3%)
Middle Eastern	1 (0.1%)	1 (0.3%)	0 (0%)
Relationship status			
Married/cohabiting	299 (41.95)	164 (43.3%)	135 (40.3%)
Single	230 (32.2%)	116 (30.6%)	114 (34%)
In a relationship (not cohabiting)	116 (16.2%)	64 (16.9%)	52 (15.5%)
Separated/divorced	38 (5.3%)	22 (5.8%)	16 (4.8%)
Widowed	31 (4.3%)	13 (3.4%)	18 (5.4%)
Employment status			
Employed	366 (51.3%)	195 (51.5%)	171 (51%)
Student	232 (32.5%)	123 (32.5%)	109 (32.5%)
Retired	161 (22.5%)	85 (22.4%)	76 (22.7%)
Unemployed	63 (8.8%)	35 (9.2%)	28 (8.4%)
Carer	15 (2.1%)	7 (1.8%)	8 (2.4%)
Highest education completed			
Primary school	1 (0.1%)	1 (0.3%)	0 (0%)
Secondary school	254 (35.6%)	136 (35.9%)	118 (35.2%)
Post-secondary	140 (19.6%)	63 (16.6%)	77 (23%)
Undergraduate	178 (24.9%)	101 (26.6%)	77 (23%)
Postgraduate	111 (15.5%)	61 (16.1%)	50 (14.9%)
PhD	27 (3.8%)	16 (4.2%)	11 (3.3%)

Percentages may not add up to 100% where some participants selected 'Prefer not to say' or in the case of employment status, where participants could select multiple options

that model fit would be improved by adding a covariance between the error terms of item 2 and item 6 (see Table 3; we expect that this represents the similar phrasing– i.e., the word "alone" and implicit negativity– in the two items), and the resulting model represented a good fit to the data: $\chi^2(8) = 23.65$, $p = .003$, $Q = 2.96$, TLI = 0.98, CFI = 0.99, RMSEA = 0.08 (90% CI, 0.04–0.11), SRMR = 0.016. The final 6-item scale is displayed in Table 3, which presents factor loadings (beta weights– β), means, and standard deviations for each item in the confirmatory sample; see Fig. 1 for visual representation. The full range of possible scores was observed in the full sample.

Reliability

Scale score reliability of the 6-item scale was evaluated using Cronbach's alpha, where values of 0.70 and above indicate acceptable internal consistency (Nunnally, 1978).

Table 3 The brief scale of existential loneliness (BSEL) with item properties (confirmatory sample, $N = 335$)

Item	β	M (SD)
1. I struggle with the feeling that I am separate from other people.	0.91	2.48 (1.25)
2. I feel like I am ultimately alone in life.	0.76	2.49 (1.26)
3. I feel an upsetting distance between myself and other people.	0.88	2.57 (1.23)
4. I struggle with the feeling that I cannot connect fully with others.	0.88	2.59 (1.30)
5. I have an upsetting feeling that I am disconnected from everyone else.	0.93	2.39 (1.22)
6. I feel utterly alone in the world.	0.74	2.06 (1.10)

β regression coefficient (i.e. factor loading), *M* mean, *SD* standard deviation

The Cronbach's alpha coefficient was 0.94 in the full sample ($N = 714$), indicating high internal consistency and reliability of the scale. The McDonald's omega coefficient was 0.94, further indicating high reliability.

Validity

Known-groups validity

Existing literature indicates that existential loneliness can occur when a person is experiencing mental health challenges (Bolmsjö et al., 2019; McKenna-Plumley et al., 2023; Nyström et al., 2002). Additionally, boundary situations are suggested to provoke existential loneliness (Moustakas, 1961). Accordingly, we expected that independent t-tests would find that BSEL scores are higher in individuals experiencing poor mental health and having experienced a boundary situation. In line with existing research using the CDC HRQOL-4, participants reporting 14 or more days of "not good" mental health out of the past 30 days were categorised as experiencing poor mental health (Min, 2019; Slabaugh et al., 2017). An independent-samples t-test confirmed that individuals experiencing poor mental health had significantly higher BSEL scores ($M = 3.16$, $SD = 0.93$) than individuals who were not ($M = 2.04$, $SD = 0.91$; $t(711) = -14.96$, $p < .001$), providing evidence of construct validity. Similarly, an independent-samples t-test confirmed that individuals who had experienced a boundary situation had significantly higher BSEL scores ($M = 2.47$, $SD = 1.05$) than

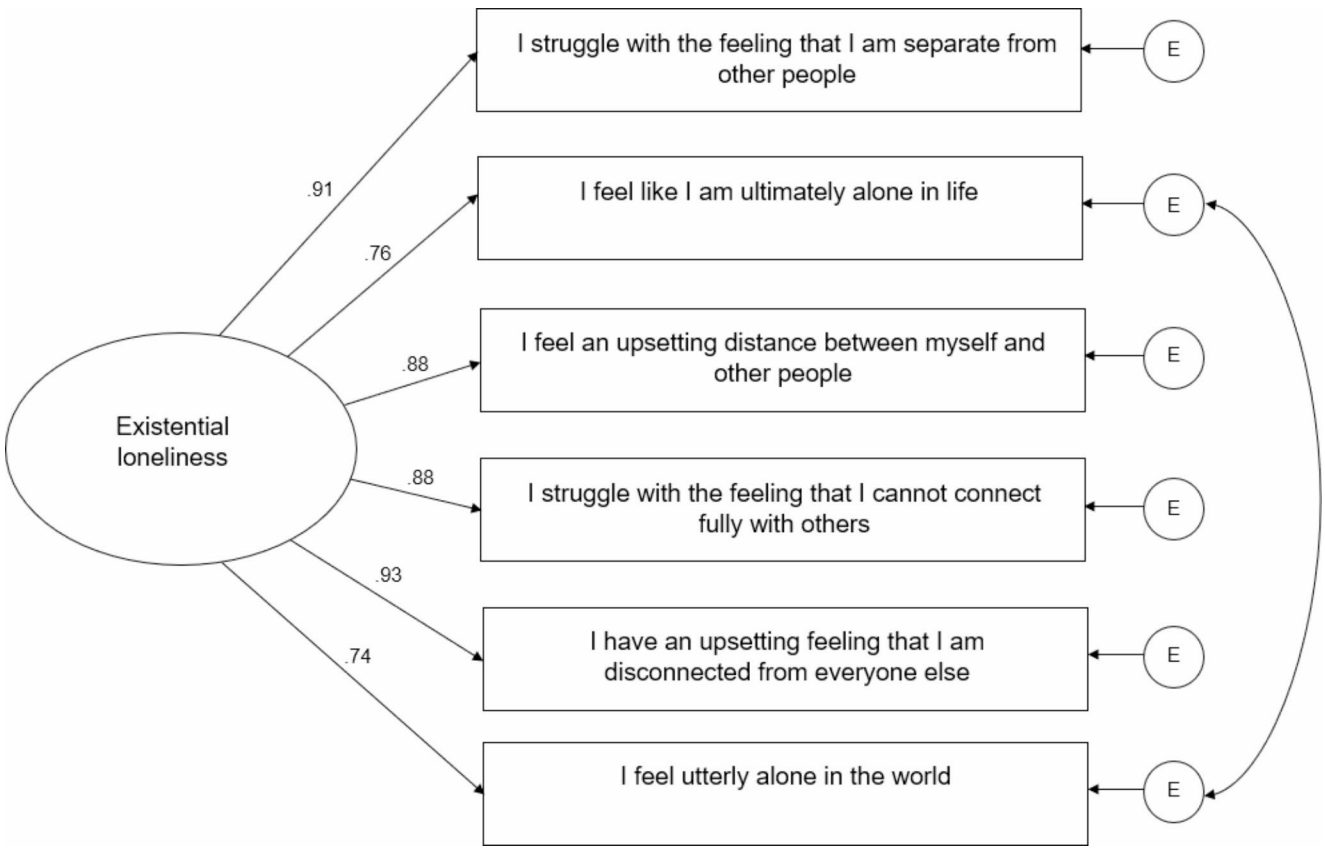

Fig. 1 Results of confirmatory factor analysis on final scale items (E = error term)

individuals who had not ($M = 2.22$, $SD = 1.01$; $t(685) = -3.15$, $p = .002$).

Convergent validity

The convergent validity of the BSEL as a measure of existential loneliness was assessed via bivariate correlations (Pearson's r) to test proposed relationships between the BSEL and theoretically related constructs (general loneliness, existential isolation, meaning in life, mental health, and experience of boundary situations) in the full sample. We expected that existential loneliness should correlate positively with loneliness broadly defined, existential isolation, emptiness, the experience of boundary situations, and frequency of poor mental health days. We also expected that it would correlate negatively with the presence of meaning in life. These hypotheses were confirmed; results are presented in Table 4.

Concurrent validity

The concurrent validity of the BSEL was assessed via bivariate correlations (Pearson's r) between the BSEL and an existing measure of existential loneliness, the ELQ (Mayers et al., 2002), in the full sample. It was expected that the BSEL would correlate positively with the ELQ and this was confirmed ($r = .82$, $p < .001$); see Table 4. Furthermore, the BSEL and the ELQ share a similar pattern of findings with other validation measures.

Discussion

The BSEL is a brief, valid, and reliable 6-item measure of existential loneliness experiences. The scale development process followed best practice guidelines (DeVellis, 2017) and included rigorous qualitative exploration into the construct (McKenna-Plumley et al., 2023). Initial qualitative inquiry is suggested to create greater validity in scale development because it is grounded in lived experiences of the construct (Rowan & Wulff, 2007). Moreover, feedback was sought from a range of academic experts and experts by experience to assess relevance, clarity, and comprehensiveness, and items were piloted with potential participants to confirm that they were comprehensible. This rigour contributed to the construction of a high-quality measure which is grounded in lived experiences of existential loneliness.

The BSEL appears to capture the construct of existential loneliness well, as evidenced by its relationships with related constructs, which aligned with preregistered hypotheses. Individuals experiencing frequent poor mental health had significantly higher scores on the BSEL, which is as expected given that existential loneliness has been noted to occur during mental health challenges (Bolmsjö et al., 2019; McKenna-Plumley et al., 2023; Nyström et al., 2002). Indeed, research indicates that loneliness and existential isolation (feeling subjectively different from others) interact to predict depression (Helm et al., 2020); further quantitative research is needed to extend findings regarding existential loneliness and mental health but this study suggests that the BSEL distinguishes between individuals experiencing frequent and infrequent mental health struggles.

Additionally, as expected, BSEL scores were significantly associated with unidimensional loneliness, existential isolation, emptiness, having experienced a boundary situation, and lack of meaning in life. These findings support the validity of the scale as a measure of existential loneliness, conceptualised as an experience of loneliness which involves feelings of profound disconnection from other people, may be characterised by feelings of emptiness and lack of meaning, and may be provoked by boundary situations. BSEL scores were more strongly associated with general unidimensional assessments of loneliness (the UCLA Loneliness Scale and direct question) than EIS scores but less strongly associated than ELQ scores, indicating that the BSEL captures the interpersonal aspect of existential

Table 4 Bivariate correlations between BSEL scores, related measures, and age

	1	2	3	4	5	6	7	8	9	10
1. Existential loneliness (BSEL)	-									
2. Existential loneliness (ELQ)	0.82***	-								
3. Loneliness (direct question)	0.74***	0.78***	-							
4. Loneliness (UCLA)	0.80***	0.80***	0.75***	-						
5. Existential isolation (EIS)	0.53***	0.58***	0.43***	0.49***	-					
6. Meaning in life– presence (MLQ-P)	−0.56***	−0.68***	−0.49***	−0.54***	−0.41***	-				
7. Emptiness (SES)	0.75***	0.83***	0.72***	0.71***	0.48***	−0.60***	-			
8. Boundary situations	0.12**	0.08*	0.11**	0.12**	0.05	−0.04	0.14***	-		
9. Poor mental health days (CDC HRQOL-4)	0.60***	0.63***	0.56***	0.55***	0.40***	−0.50***	0.70***	0.18***	-	
10. Age	−0.18***	−0.24***	−0.13***	−0.20***	−0.14***	0.22***	−0.23***	−0.06	−0.27***	-

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

loneliness and may be more differentiated from unidimensional loneliness than the ELQ. The same pattern of associations was observed between these scales for meaning in life, emptiness, and poor mental health days. With respect to boundary situations, BSEL scores showed a small association, while the association with ELQ scores was smaller and the EIS was not significantly associated with these experiences. These findings suggest that the BSEL is a useful measure of existential aspects of loneliness which shows the predicted pattern of associations with psychological and contextual variables.

With respect to age, higher scores on the BSEL were significantly associated with younger age in the present sample of adults from 17 to 84 years old. Although research focusing on the subjective experience of existential loneliness has generally focused on older adults (Carr & Fang, 2021; Larsson et al., 2019; Sjöberg et al., 2019), this finding suggests that the BSEL should be employed to better understand this dimension of loneliness in younger age groups, where existential loneliness might be particularly prevalent. Brennan (1982) suggests that existential loneliness may emerge in adolescence and recent qualitative research indicates that adolescents may experience it during the transition from childhood to adulthood (Garnow et al., 2022). This correlation is small but suggests that earlier adulthood may be an important period for existential loneliness. Relatedly, interventions aiming to manage loneliness might benefit from addressing this dimension in younger adults.

Given that there is a growing interest in studying specific dimensions of loneliness such as social and emotional loneliness (Weiss, 1973), cultural loneliness (Sawir et al., 2008), and physical loneliness (Noone & McKenna-Plumley, 2022; Zheng et al., 2023), an appropriate instrument to measure the existential dimension of loneliness will contribute to research and practice in this area. Indeed, loneliness is often described as involving existential, social, and emotional dimensions (Campaign to End Loneliness, 2023; O'Sullivan et al., 2022; Willis et al., 2022) but little quantitative research has focused on the existential dimension. As a brief and valid measure of the subjective experience of existential loneliness, the BSEL provides a useful measure for exploring existential loneliness as a dimension alongside social and emotional loneliness, which are generally measured using the de Jong Gierveld Loneliness Scale (de Jong Gierveld & van Tilburg, 2006). This may also be instrumental for evaluating the impact of loneliness interventions. The BSEL can therefore contribute to work aiming to assess the prevalence, correlates, and consequences of existential loneliness.

Limitations and future directions

The BSEL has been rigorously developed and validated in a large sample of adults at various life stages. It should be noted that the current sample is not proportionally representative of the UK and Ireland populations, however, for example with respect to ethnicity. A portion of the participants were collected and compensated via Prolific; this could lead to biased responding although data quality from Prolific is high (Douglas et al., 2023) and our Prolific sample passed multiple attention checks. Test-retest reliability has not been assessed and therefore more research is needed to assess temporal stability of scale scores, although scores may vary across test intervals given that loneliness can be transient or long-lasting. Additionally, a relatively simplistic measure of mental health was used in the present study; future research might benefit from using more nuanced measures to assess specific aspects of mental health that might be particularly relevant to existential loneliness (for example, PTSD or trauma, given the relevance of boundary situations to the experience of this type of loneliness; Moustakas, 1961). Feedback from a content expert also noted that the scale does not cover connection to non-humans, such as nature or a higher power; although the scale does include items tapping into feelings of aloneness in a non-specific manner, these more specific aspects of disconnection may be assessed alongside the BSEL via additional scales. Given the deleterious impacts of loneliness on physical and mental health and wellbeing, future studies should use the BSEL in combination with measures of other loneliness dimensions to further assess prevalence, correlates, and consequences of this form of loneliness.

Conclusion

The BSEL is a robust scale for measuring existential loneliness. Unlike many measures of loneliness and related constructs, the BSEL has been developed based on in-depth qualitative inquiry into the construct as well as a thorough review of the existing literature. This makes it a particularly appropriate measure of the existential dimension of loneliness, which is a fundamentally subjective experience. The scale specifically captures the negative valence of existential loneliness as an experience of profound aloneness and separation from others. As an increasing amount of research and policy are focusing on loneliness and attempts to alleviate it, we hope that the BSEL will encourage further inquiry into the existential dimension of loneliness and methods of coping with the experience.

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RT: Visualization, Supervision, Writing– review & editing.
KY: Visualization, Supervision, Writing– review & editing.
JG: Conceptualization, Methodology, Visualization, Supervision, Writing– review & editing.

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Data availability The preregistration, record of alterations from the preregistration, and data that support the findings of this study are available on the Open Science Framework at https://osf.io/w46yp.

Declarations

Conflict of interest The authors have no conflict of interest to declare. Informed consent was obtained from all individual participants included in the study.

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