Original Article

UCLA 3-Item Loneliness Scale: Translation and Validation in Greek

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Abstract

Background: Loneliness is described as the unpleasant feeling that arises when a person's social connections are lacking in some significant way, either in quantity or quality. **Aim:** To translate and validate the UCLA 3-Item Loneliness Scale (UCLA LS-3) in the Greek language. **Methods:** We employed the forward-backward method to translate and adapt the UCLA LS-3 in Greek language. In particular, two scholars translated the English version of the UCLA LS-3 in Greek, and then two other scholars back translated the Greek version in English. Another scholar overviewed the translation procedure solving any discrepancies. We examined the reliability of the UCLA LS-3 by calculating Cronbach's alpha. Also, we performed a test-retest study to examine the reliability of the UCLA LS-3 by calculating the intraclass correlation coefficient. We examined the construct validity of the UCLA

LS-3 by performing confirmatory factor analysis. We examined the concurrent validity of the UCLA LS-3 using the TikTok Addiction Scale (TTAS). **Results:** We found that the UCLA LS-3 had very good reliability since intraclass correlation coefficient for the test-retest was 0.976 (95% confidence interval = 0.969 to 0.982, p<0.001). Moreover, Cronbach's coefficient alpha for the UCLA LS-3 was 0.89. We found that the Greek version of the UCLA LS-3 had a one-factor structure as the original version. All indices indicated an acceptable one-factor model. In particular, x^2/df was 0.0, RMSEA was 0.0, GFI was 1.0, AGFI was 1.0, TLI was 1.0, IFI was 1.0, NFI was 1.0, and CFI was 1.0. Concurrent validity of the Greek version of the UCLA LS-3 was very good since we found statistically significant correlation between the UCLA LS-3 and the TTAS (r = 0.252, p<0.001). **Conclusion:** The Greek version of the UCLA 3-Item Loneliness Scale is a reliable and valid tool to measure levels of loneliness in the general population.

Keywords: UCLA 3-Item Loneliness Scale; validation; Greek; validity; reliability; TikTok Addiction Scale

Introduction

Loneliness is described as the unpleasant feeling that arises when a person's social connections are lacking in some significant way, either in quantity or quality (Perlman & Peplau, 1981). It is a major concern for regional communities today. Research has indicated that 80% of adolescents and 40% of those over 65 have experienced loneliness at some point in their lives (Berguno et al., 2015; Pinquart & Sorensen, 2001; Weeks, 1994). Accurately determining the prevalence of loneliness and social isolation is challenging due to variations throughout life, cultural and gender differences in individuals' willingness to discuss personal matters, and the use of different measurement tools, some relying on self-reported questionnaires and others on more objective evaluations of social interactions or networks (Leigh-Hunt et al., 2017). Pinquart and Sorenson (Pinquart & Sorensen, 2001) found that loneliness tends to decrease through middle adulthood but rises again in those over 70. Nonetheless, about 15–30% of the general population experiences chronic loneliness (Heinrich & Gullone, 2006; Theeke, 2009).

Loneliness is acknowledged as a significant factor in various health issues, being closely linked to problems like youth mental health, childhood abuse, alcohol dependency in older age, and depression (Cacioppo et al., 2010; Jones et al., 2011; Rew, 2002). A closer look reveals that loneliness is associated with numerous health risks among mothers and young to middle-aged women, including life satisfaction, perceived health, depression, the onset of heart disease, and a higher risk of mortality (Elovainio et al., 2017; Liu & Guo, 2008; Sorkin et al., 2002; Tijhuis, 1999). Persistent loneliness is connected to a decline in mental health and symptoms like anxiety and depression (Bekhet et al., 2008; Junttila et al., 2015).

Social integration is vital for development throughout life, but it becomes especially crucial in later years. Recent studies have

shown that emotional closeness in relationships tends to increase with age. However, the number of social connections often decreases, and events that significantly disrupt social ties (such as the death of a parent, children leaving home, relocation, or the death of a spouse) may become more frequent (Carstensen et al., 1999; Martire et al., 1999; Rowe & Kahn, 1997). Most research on social relationships in later life focuses on the quantity (e.g., number of people, frequency of contact) or the content (practical help, advice) of social interactions, rather than on individuals' perceived social isolation (Berkman & Syme, 1979; Seeman, 2000; Uchino et al., 1996).

In this context, we translated and validated the UCLA 3-Item Loneliness Scale (UCLA LS-3) (Hughes et al., 2004; D. W. Russell, 1996) in the Greek language.

Methods

Study design: Study population included 223 participants in Greece. We performed our study during January 2025. We employed the forward-backward method to translate and adapt the UCLA LS-3 in Greek language (Galanis, 2019). In particular, two scholars translated the English version of the UCLA LS-3 in Greek, and then two other scholars back translated the Greek version in English. Another scholar overviewed the translation procedure solving any discrepancies.

We examined the reliability of the UCLA LS-3 by calculating Cronbach's alpha. Cronbach's alpha higher than 0.6 indicates acceptable internal reliability. Also, we performed a test-retest study to examine the reliability of the UCLA LS-3 by calculating the intraclass correlation coefficient.

We examined the construct validity of the UCLA LS-3 by performing confirmatory factor analysis (Galanis, 2013). We examined the concurrent validity of the UCLA LS-3 using the TikTok Addiction Scale (TTAS) (Bilali et al., 2025; Galanis et al., 2024, 2025; Katsiroumpa et al., 2025). We expected a positive correlation between the UCLA LS-3 and the TTAS.

Ethical considerations: We applied the guidelines of the Declaration of Helsinki to perform this study (World Medical Association, 2013). Additionally, the study protocol was approved by the Ethics Committee of Faculty of Nursing, National and Kapodistrian University of Athens (approval number; 05, October 10; 2024).

Statistical analysis: We performed confirmatory factor analysis (CFA) to examine the construct validity of the UCLA LS-3. In particular, we calculated chi-square/degree of freedom (x^2/df); root mean square error of approximation (RMSEA); goodness of fit index (GFI); adjusted goodness of fit index (AGFI); Tucker–Lewis index (TLI); incremental fit index (IFI); normed fit index (NFI); comparative fit index (CFI) (Baumgartner & Homburg, 1996; Hu & Bentler, 1998). Acceptable value for x^2/df is <5, for RMSEA is <0.10, and for all other measures in the CFA >0.90. We used the AMOS version 21 (Amos Development Corporation, 2018) to conduct the CFA. We calculated Pearson's correlation coefficient between the UCLA LS-3 and the TTAS to examine the concurrent validity of the UWES. Also, we calculated intraclass correlation coefficients between the two UCLA LS-3 measurements in test-retest study. P-values less than 0.05 were considered as statistically

significant. We used the IBM SPSS 28.0 (IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp) for the analysis.

Results

Study population included 223 participants from the general population. Among them, 82.1% (n=183) were females and 17.9% (n=40) were males. Mean age of our sample was 27.2 years (standard deviation; 10.6).

We found that the UCLA 3-Item Loneliness Scale had very good reliability since intraclass correlation coefficient for the test-retest was 0.976 (95% confidence interval = 0.969 to 0.982, $p<0.001$). Moreover, Cronbach's coefficient alpha for the UCLA LS-3 was 0.79.

We performed confirmatory factor analysis to examine the structure of the UCLA LS-3 and we found that the Greek version of the UCLA LS-3 had a one-factor structure as the original version (Figure 1).

Table 1 presents model fit indices for the confirmatory factor analysis. All indices indicated an acceptable one-factor model. In particular, x^2/df was 0.0, RMSEA was 0.0, GFI was 1.0, AGFI was 1.0, TLI was 1.0, IFI was 1.0, NFI was 1.0, and CFI was 1.0. Moreover, standardized regression weights for the nine items ranged from 0.61 to 0.92.

Concurrent validity of the Greek version of the UCLA LS-3 was very good since we found statistically significant correlation between the UCLA LS-3 and the TTAS ($r = 0.252$, $p<0.001$).

Table 1. Confirmatory factor analysis for the Greek version of the UCLA 3-Item Loneliness Scale.

Model	x^2	df	x^2/df	RMSEA	GFI	AGFI	TLI	IFI	NFI	CFI
Nine items	0.0	0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0

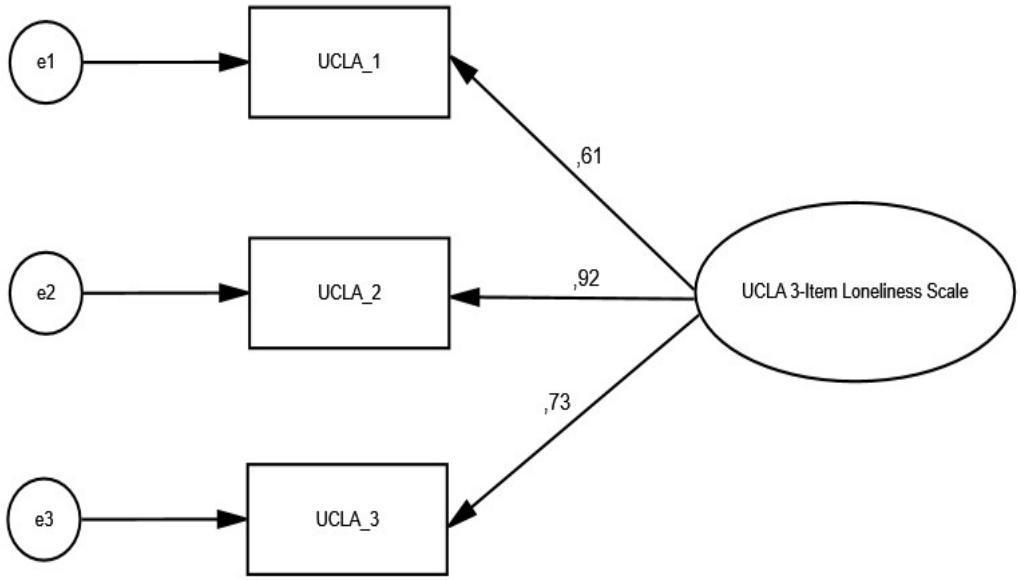

Figure 1. Confirmatory factor analysis for the Greek version of the UCLA 3-Item Loneliness Scale.

Discussion

Our study shows that the Greek version of the UCLA 3-Item Loneliness Scale exhibits very good psychometric characteristics, confirming its validity and reliability as a tool for assessing levels of loneliness.

Our research sought to confirm the dependability and accuracy of the UCLA LS-3 within the general populace. Similar to the original, the UCLA LS-3 is characterized by its unidimensionality, its avoidance of the term "loneliness," and its assessment of loneliness within a contextual framework. The extensive application of the UCLA LS-3 is anticipated to encourage additional empirical research on loneliness among the general public. Furthermore, as this scale consists of a 3-item, self-administered questionnaire, it allows respondents to complete it swiftly and with ease. Employing the general population enables researchers to conduct comparisons at both individual and population levels, making this scale potentially valuable for assessing loneliness in community health environments.

The UCLA Loneliness Scale version 3 (UCLA-LS3), a revision by Russell of the original UCLA-LS, has been adapted and validated across various populations in countries such as Australia, Turkey, Northern Ireland, Iran, Italy, and Japan. These adaptations have proven to be highly feasible and applicable within their respective demographics. The scale consists of 20 items, consistently demonstrating strong convergent validity and internal consistency. Additionally, several shorter versions of the scale have been created. Notably, a 10-item version, derived from the unidimensional

UCLA-LS3, was introduced in 1996, and a 3-item version, based on the 20-item multidimensional UCLA-LS revised, was developed by Hughes. The UCLA LS-10 aligns well with the unidimensional model of the UCLA-LS3 [35]. The three items in the UCLA LS-3 were chosen due to their highest loading on the first factor of a three-factor model. A comparative study of the UCLA-LS short forms indicated that both the UCLA LS-10 and UCLA LS-3 are reliable and valid. Consequently, the UCLA-LS20 and its two shorter versions (UCLA LS-10 and UCLA LS-3) have become some of the most widely utilized measures of loneliness globally (Boffo, 2012; Durak & Senol-Durak, 2010; Elphinstone, 2018; Hughes et al., 2004; D. Russell et al., 1978, 1980; D. W. Russell, 1996; Shevlin et al., 2015; Zarei et al., 2016).

Our study encountered a few limitations. We utilized a convenience sample of the general population to validate the UCLA LS-3 in Greek, which limits the generalizability of our findings. It is important to validate this tool with other samples in Greece. Additionally, we used self-reported questionnaires, including the TTAS, to examine the concurrent validity of the UCLA LS-3. Researchers could also explore various other types of validity for the UCLA LS-3.

In summary, the Greek version of the UCLA 3-Item Loneliness Scale demonstrated very good psychometric properties, making it a valid and reliable instrument for assessing levels of loneliness in the general population.

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