

Factor Structure of Loneliness: Confirmatory Factor Analysis of the UCLA Loneliness Scale (Version 3) in Emerging Adults

(Struktur Faktor Kesepian: Analisis Faktor Konfirmatori Skala Kesepian UCLA (Versi 3) pada Emerging Adults)

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Abstract: Loneliness negatively affects psychological health. The UCLA Loneliness Scale (Version 3; UCLA-LS-V3) is the primary global measure of loneliness. Despite inconsistent findings regarding its factor structure, currently, no research has examined the factor structure of the UCLA-LS-V3 among emerging adults in Indonesia. The objective of the present study was to address the research gap by evaluating the factor structure, construct validity, and reliability, and adapting the scale for use with Indonesian emerging adults. A total of 396 participants with an average age of 20.24 years were involved in this study. Confirmatory factor analysis generated findings that the UCLA-LS-V3 is better represented by two- and three-factor models than by a one-factor model, and that it supports the scale's use in research and intervention programs among emerging adults in Indonesia.

Keywords: confirmatory factor analysis; loneliness; UCLA Loneliness Scale

Abstrak: Kesepian berdampak negatif terhadap kesehatan psikologis. UCLA Loneliness Scale (Versi 3; UCLA-LS-V3) dianggap sebagai alat ukur utama kesepian secara global. Meskipun terdapat temuan yang tidak konsisten mengenai struktur faktor dari skala tersebut, saat ini belum terdapat penelitian yang mengkaji struktur faktor UCLA-LS-V3 pada emerging adults di Indonesia. Studi ini bertujuan untuk mengatasi kesenjangan penelitian tersebut dengan mengevaluasi struktur faktor, validitas konstruk, dan reliabilitas UCLA-LS-V3, serta mengadaptasi skala tersebut untuk digunakan pada emerging adults di Indonesia. Sebanyak 396 partisipan, dengan usia rata-rata 20,24 tahun dilibatkan dalam penelitian ini. Analisis faktor konfirmatori menghasilkan temuan bahwa UCLA-LS-V3 lebih baik direpresentasikan oleh model dua dan tiga faktor daripada model satu faktor, dan mendukung penggunaan skala tersebut dalam penelitian dan program intervensi pada emerging adults di Indonesia.

Kata Kunci: confirmatory factor analysis; kesepian; UCLA Loneliness Scale

INTRODUCTION

Loneliness is often regarded as an ordinary human experience (Takács et al., 2024; Van Tilburg, 2021). Loneliness is defined as the discrepancy between perceived and desired levels of social relationships of an individual (Ozdemir & Tan, 2024; Shovestul et al., 2020) and is characterized as an unpleasant state as the common theme (Kwiatkowska et al., 2018).

Research has found the negative impacts of loneliness, such as sleep problems, anxiety, and depressive symptoms, and negative effects on the education and employment of young adults, such as lowering academic achievement and increasing the likelihood of dropping out of school and leaving the workforce, cognitive decline, and social isolation, which requires comprehensive interventions (Hodgson et al., 2020; Lindsay et al., 2019; Maes et al., 2022; Shovestul et al., 2020).

A study in Indonesia (Peltzer & Pengpid, 2019) reported that the highest prevalence of loneliness was among adolescents and older adults aged 80 years and above. Research found that loneliness is a common experience in emerging adulthood (Kirwan et al., 2023). Recent demographic trends suggest that young people are spending more time in education and delaying marriage, giving rise to a new developmental stage, commonly referred to as emerging adulthood (Arnett, 2016). Emerging adults may be vulnerable to experiencing loneliness because they often have not yet established stable adult

life structures, particularly in personal relationships (Arnett, 2016; Robinson, 2018).

Despite its negative effects and high prevalence, loneliness and its associated consequences are often not a priority in health programs (Kanougiya et al., 2025). Therefore, the present study evaluated the psychometric properties of the UCLA-LS-3 and adapted the scale for use with emerging adults in Indonesia. The results of the present study contribute to providing a valid and reliable instrument for research and intervention in the Indonesian emerging-adult context and to the cross-cultural validation of the UCLA-LS-V3.

The UCLA Loneliness Scale, is the most widely acknowledged measure of loneliness, according to Ozdemir and Tan (2024) and Pérez-Lara et al. (2025), despite the emergence of the recent development of new loneliness scales, such as the Multidimensional Loneliness Scale (Pérez-Lara et al., 2025). This might be related to the simple scoring technique and the UCLA-LS-V3's format (Takács et al., 2024).

The scale has three versions, namely the UCLA LS (Russell et al., 1978), the Revised UCLA LS (Russell et al., 1980), and the UCLA LS Version 3, abbreviated in the present study as the UCLA-LS-V3 (Russell, 1996).

Several problems with response bias and discriminant validity were evident in the first version. Items were worded in the similar direction, so higher scores indicate feelings of social dissatisfaction. This may have led to systematic response bias, which could have influenced the total score. Another concern was the discriminant validity and the social

desirability. Because of social stigma around loneliness, participants may not have reported their loneliness (Russell et al., 1980). To address these problems, a revised version was developed. The original scale was administered with 19 new items measuring social relationships' satisfaction, with the opposite wording in the items from the original scale (Russell et al., 1980).

Despite its widespread use, problems with the UCLA Loneliness Scale have become apparent, especially when it is used with populations other than college students. Much of Russell's research using the UCLA Loneliness Scale involved college students. A problem with the revised scale was its item wording. Some words or phrases in the scale were difficult for elderly participants to understand because they contained double negatives. The scale's reliability also suffers when used to measure loneliness among the elderly. Another problem in using the scale with college students concerns the readability of the questions, as in item 12 (Russell et al., 1980).

Differences in item formulation were made, in which declarative sentences in the R-UCLA were reformulated as questions in the UCLA-LS-V3 (Kwiatkowska et al., 2018): "How often do you feel ..." (Russell, 1996). According to Russell (1996), this version had satisfactory reliability across different samples and was used with various populations, including college students, nurses, and older adults.

The UCLA Loneliness Scale was criticized for its unidimensional construct

(Russell, 1996). Nevertheless, research has yielded inconsistent findings regarding the factor structure. According to Kwiatkowska et al. (2018), the identical characteristics or symptoms of loneliness can be grouped into factors, resulting in multidimensionality.

Da Mata et al. (2022) conducted an exploratory factor analysis of the UCLA-LS-V3 among aged individuals, which indicated that the scale had adequate fit for a unidimensional structure and high internal consistency. Nevertheless, the results in the aged population were inconsistent, suggesting the presence of more than one factor, such as a two-, three-, or four-dimensional model (Da Mata et al., 2022).

A study in Japan supported a unidimensional, single-factor model, and the scale demonstrated high internal consistency (Arimoto & Tadaka, 2019). This study found that loneliness was negatively correlated with subjective health perception (Arimoto & Tadaka, 2019). Another research (Lin et al., 2022) found a unidimensional structure for the 20-item (Version 3), eight-item, and three-item scales, and acceptable internal consistency among men with sexual preferences categorized as a minority status in Taiwan. Loneliness demonstrated a positive correlation with both depression and anxiety, and no significant differences in loneliness were found between the men's sexual preferences in this study (Lin et al., 2022).

Maes et al. (2022) found that the three versions of the UCLA-LS were mostly used as a unidimensional scale. According to this study, several studies have proposed different factor

solutions. However, no agreement has yet been reached on the factor structure: whether the factors measure distinct loneliness types or whether they represent only item wording, with positive and negative items tending to group together (Maes et al., 2022). Studies reported that multiple-factor solutions often consisted of 2 or 3 factors. Different labels were given to the factors, sometimes with overlap and different items (Maes et al., 2022).

Several studies have identified that the UCLA-LS-V3 had a two-factor structure. Wongpakaran et al. (2020)'s research with a sample of medical students found a two-factor model. According to the study, the scale contains a similar number of items in negative and positive forms, thus reducing agreement bias (Wongpakaran et al., 2020). This response bias is often observed in Likert-type instruments (Han et al., 2026).

A study involving Hungarian adolescents (Takács et al., 2024) and Korean older adults who live alone (Lee et al., 2021) found two factors of the UCLA-LS-V3. This research found that the two-factor models of the UCLA-LS-V3 had high reliability (Lee et al., 2021; Takács et al., 2024), while Wongpakaran et al. (2020) observed sufficient to good reliability in two medical student samples.

Despite findings from previous research of one and two factors of the UCLA-LS-V3, research also found the three-factor model, with good fit and high reliability in samples of adolescents in Poland (Kwiatkowska et al., 2018) and students in Iran (Zarei et al., 2016).

Giri and Dubey (2025) research on the UCLA-LS-V3 found that the model consisted of two factors and three-factor models fit the data better, whereas the one-factor model did not fit the data from universities and communities in India. The scale demonstrated high reliability and discriminant validity, with a positive association with the depression measure (Giri & Dubey, 2025). A study by Ozdemir and Tan (2024) reported that the UCLA-LS-V3 had the two-factor and second-order three-factor models, which showed as the best fit. Sample size and age were variables that could have accounted for the differences (Ozdemir & Tan, 2024).

A systematic review compared the UCLA-LS-V3 with its short forms (Alsubheen et al., 2023) and confirmed strong test-retest reliability and low to moderate construct validity for the UCLA-LS-V3.

Early identification and accurate measurement are essential for interventions to alleviate the negative impacts of loneliness (Da Mata et al., 2022; Richardson et al., 2017). Cross-cultural research on loneliness showed inconsistent results (Barreto et al., 2021). Research using the UCLA-LS-V3 indicated that age, gender, and cultural context were significant predictors of loneliness. It tends to decrease with age, is more common in individualistic cultures, and younger men are identified as the most susceptible to loneliness (Barreto et al., 2021).

A study reported that the one-, two-, and three-factor structures did not meet the good-fit criteria for the UCLA-LS-V3 with 20 items, but the UCLA-LS six-item version was

suitable for measuring loneliness in cross-cultural research (Hudiyana et al., 2021). Research tested the validity of the UCLA-LS-V3 with a sample of adolescents aged 13 to 18 years living in an Indonesian orphanage. The study reported evidence of a one-factor model and suggested using the back-translation method by competent translators (Nurdiani, 2013). Another research tested the validity of the UCLA-LS-V3 on adults aged 20–34 in Indonesia using the Rasch Model. The results showed the multidimensionality of the UCLA-LS-V3 and that one item did not meet the model fit criteria (Rahimmatussalisa & Rinaldi, 2025). A study assessed the factor structure of the 1978 version of the UCLA-LS among unmarried young adult women in Indonesia. The results demonstrated that the two-factor model provided a better fit than the unidimensional and three-factor models (Surijah & Nanik, 2024).

The objectives of this study are to address the research gap concerning the inconsistent factor structure of the UCLA-LS-V3 and to examine its factor structure, construct validity, reliability, and adaptation within the context of emerging adults.

This study addresses the following research questions: Does the UCLA-LS-V3 have a one-factor structure, as previously reported by Russell (1996)? Is the UCLA-LS-V3 a valid and reliable instrument for assessing loneliness in emerging adults?

METHODS

Participants. A total of 396 participants with a mean age of 20.24 years (SD = 2.51) were included in this study. The age group with the highest frequency was 19 years old, which was the largest proportion of the sample (39.14%). Table 1 describes a more detailed demographic description of the participants.

Research design. The present study employed a non-experimental quantitative research design, without any manipulation or intervention to participants (Creswell & Creswell, 2018). A cross-sectional approach was used, with data collected at a single point in time over a brief period. Research utilizing this methodology typically employs survey methods and standardized measurement instruments (Creswell & Creswell, 2018).

Table 1. Demographic of Participants

Category	Frequency	Percentage (%)
Gender		
Woman	165	41.7
Man	231	58.3
Domicile		
Bekasi	44	11.1
Bogor	61	15.4
Depok	60	15.2
Jakarta	163	41.2
Tangerang	29	7.3
Outside Jabodetabek	39	9.8
Education Level		
Junior High School	2	0.5
Senior High School/ Vocational High School	349	88.1
Diploma	5	1.3
Bachelor's Degree	38	9.6
Master's Degree	2	0.5
Employment Status		
Part-Time Employed	21	5.3
Full-Time Employed	85	21.5
Unemployed/Not employed	54	13.6
Entrepreneur	8	2.0
Student	203	51.3
Other	25	6.3
Residence Status		
Living with family	322	81.3
Living with friends	13	3.3
Living alone	61	15.4

Research Instruments. The UCLA-LS-V3 (Russell, 1996) comprises 11 negatively worded items assessing loneliness and 9 positively worded items assessing non-loneliness. The scale consists of 20 items with answers in the form of a four-point Likert scale, namely Never (1), Rarely (2), Sometimes (3), and Always (4). Each item begins with the statement "How often do you feel ..." to facilitate the administration of the scale in research in both personal and telephone interviews. The scale's total score ranges from 20 to 80, with higher scores indicating greater

loneliness. Confirmatory factor analysis indicated that the UCLA-LS-V3 assesses a single global factor of loneliness (Russell, 1996).

The translation of the UCLA-LS-V3 employed the back-translation method (Appelbaum et al., 2018). Professional translators and psychology lecturers with expertise in the construct participated in the translation process. The translated items were found to be semantically equivalent to the original items. Details regarding the translation of items are provided in Table 2.

Table 2. Translation of Items in the UCLA-LS-V3

Item Number	English Items	Indonesian Language Adaptation Items
1*	How often do you feel that you are "in tune" with the people around you?	Seberapa sering Anda merasa selaras dengan orang-orang di sekitar Anda?
2	How often do you feel that you lack companionship?	Seberapa sering Anda merasa kurang memiliki teman dekat?
3	How often do you feel that there is no one you can turn to?	Seberapa sering Anda merasa tidak ada orang yang bisa Anda andalkan?
4	How often do you feel alone?	Seberapa sering Anda merasa sendiri?
5*	How often do you feel part of a group of friends?	Seberapa sering Anda merasa menjadi bagian dari suatu kelompok pertemanan?
6*	How often do you feel that you have a lot in common with the people around you?	Seberapa sering Anda merasa memiliki banyak kesamaan dengan orang-orang di sekitar Anda?
7	How often do you feel that you are no longer close to anyone?	Seberapa sering Anda merasa tidak lagi dekat dengan siapa pun?
8	How often do you feel that your interests and ideas are not shared by those around you?	Seberapa sering Anda merasa minat dan ide Anda tidak sejalan dengan orang-orang di sekitar Anda?
9*	How often do you feel outgoing and friendly?	Seberapa sering Anda merasa mudah bergaul dan ramah?
10*	How often do you feel close to people?	Seberapa sering Anda merasa dekat dengan orang lain?
11	How often do you feel left out?	Seberapa sering Anda merasa tersisih?
12	How often do you feel that your relationships with others are not meaningful?	Seberapa sering Anda merasa hubungan Anda dengan orang lain tidak bermakna?
13	How often do you feel that no one really knows you well?	Seberapa sering Anda merasa tidak ada yang benar-benar mengenal Anda?
14	How often do you feel isolated from others?	Seberapa sering Anda merasa terasing dari orang lain?
15*	How often do you feel you can find companionship when you want it?	Seberapa sering Anda merasa bisa menemukan teman saat Anda membutuhkan?
16*	How often do you feel that there are people who really understand you?	Seberapa sering Anda merasa ada orang yang benar-benar memahami Anda?
17	How often do you feel shy?	Seberapa sering Anda merasa malu?
18	How often do you feel that people are around you but not with you?	Seberapa sering Anda merasa orang-orang ada di sekitar Anda tetapi tidak benar-benar bersama Anda?
19*	How often do you feel that there are people you can talk to?	Seberapa sering Anda merasa ada orang yang bisa diajak bicara?
20*	How often do you feel that there are people you can turn to?	Seberapa sering Anda merasa ada orang yang bisa diandalkan?

* Item with reverse-coded

Research procedure. Participants provided their consent to participate in this research by completing the informed consent statement in the online questionnaire to fulfill ethical considerations. Students with similar characteristics to the participants in this study were involved to test the readability of the instrument. An online Google Form questionnaire was used to collect the data. Participants were able to complete the instruments from a convenient location (McGee et al., 2020). Social media, such as Facebook and Instagram, were used to distribute the research questionnaire.

Data analysis. To assess the UCLA-LS-V3 model's fit to the data, a confirmatory factor analysis (CFA) was conducted (Hair et al., 2019). RMSEA values ≤ 0.08 ; CFI ≥ 0.90 , and TLI ≥ 0.90 indicate an adequate fit between the data and the theoretical model (Hu & Bentler, 1999; Kline, 2016). Item accuracy was evaluated based on the factor loading value, which explained the contribution of an item to the factor that it measures (Hair et al., 2019).

The UCLA-LS-V3's convergent validity was assessed using Average Variance Extract (AVE), with items weighted by the individual loadings of the construct indicators. The minimum acceptable AVE is 0.50 (Hair et al., 2018).

Cronbach's alpha was employed to test the internal consistency reliability of the UCLA-LS-V3. Cronbach's alpha is the most widely used measure of reliability, and the minimum reliability criterion is 0.7, which is classified as moderate (Hair et al., 2019). This study also reports composite reliability (CR) to provide a

more precise estimate of reliability, as the items are unweighted in Cronbach's alpha (Hair et al., 2019).

This study was guided by theory and relevant previous studies. The UCLA-LS-V3 has been theoretically conceptualized as a unidimensional measure of loneliness (Russell, 1996). However, research have reported inconsistencies in its factor structure, with one-, two-, and three-factor models identified. Because the theory of loneliness has developed and previous studies reported a number of factors of loneliness measured by the UCLA-LS-V3, therefore, possible solutions were not tested (Kline, 2016; Umar & Nisa, 2020), and CFA was used to test the measurement model, which consisted of one, two, and three-factor models, as in Giri and Dubey's (2025) research. This study employed the WLSMV estimator to assess the model's suitability for the data. Analysis of descriptive data and CFA were conducted using Jamovi 2.4.8 statistical software (The jamovi project, 2023).

RESULTS

Factor Structure of the UCLA-LS-V3

The CFA test was conducted in three groups according to previous research: one factor (Arimoto & Tadaka, 2019; Lin et al., 2022; Nurdiani, 2013; Russell, 1996); two-factor (Lee et al., 2021; Takács et al., 2024; Wongpakaran et al., 2020), and three-factor (Kwiatkowska et al., 2018; Zarei et al., 2016) to determine which model provided the best fit to the data. Model fit was assessed by comparing the fit indices across tests. Item groups were determined

based on factors from previous research. A summary of item groups by factor is described in Table 3.

CFA testing of the three models was conducted using the WLSMV estimator, given that all indicators used a 4-point Likert scale. Several fit indices, chi-square (χ^2), CFI, TLI, RMSEA, and SRMR, were used to assess the UCLA-LS-V3's model fit. Based on fit indices, the two- and three-factor models were significantly superior to the one-factor model in this study. Table 4 describes the comparison of the fit indices for the three models.

The factor loadings of the three models ranged from moderate to high. In the one-factor

model, the factor loading ranges from 0.358 to 0.836. In the two-factor model, the factor loadings on the intimate loneliness dimension ranged from 0.432 to 0.872, and on the relational loneliness dimension ranged from 0.576 to 0.805.

Meanwhile, in the three-factor model, the factor loadings on the isolation dimension ranged from 0.431 to 0.872, on the collective connectedness dimension from 0.635 to 0.731, and on the relational connectedness dimension from 0.712 to 0.813. Table 5 provides a more detailed description of the results.

Table 3. Distribution of UCLA Loneliness Items Based on One-, Two-, and Three-Factor Models

1 Factor Model	2 Factors Model		3 Factors Model		
General Loneliness	Intimate Loneliness	Relational Loneliness	Isolation	Collective Connectedness	Relational Connectedness
LN2	LN2		LN2		
LN3	LN3		LN3		
LN4	LN4		LN4		
LN7	LN7		LN7		
LN8	LN8		LN8		
LN11	LN11		LN11		
LN12	LN12		LN12		
LN13	LN13		LN13		
LN14	LN14		LN14		
LN17	LN17		LN17		
LN18	LN18		LN18		
LN1_n		LN1_n		LN1_n	
LN5_n		LN5_n		LN5_n	
LN6_n		LN6_n		LN6_n	
LN9_n		LN9_n		LN9_n	
LN10_n		LN10_n			LN10_n
LN15_n		LN15_n			LN15_n
LN16_n		LN16_n			LN16_n
LN19_n		LN19_n			LN19_n
LN20_n		LN20_n			LN20_n

Table 4. Comparison of Fit Indices on One, Two, and Three Factor CFA

Fit Indices	1 Factor	2 Factors	3 Factors
χ^2	1.814.74 ($p < 0.001$)	722.77 ($p < 0.001$)	724.39 ($p < 0.001$)
(p-value)	(poor fit)	(poor fit)	(poor fit)
df	170	167	169
CFI	0.744 (poor fit)	0.914 (acceptable fit)	0.914 (acceptable fit)
TLI	0.714 (poor fit)	0.902 (acceptable fit)	0.903 (acceptable fit)
RMSEA	0.157	0.092 (acceptable marginal limit)	0.091 (acceptable marginal limit)
SRMR	0.146 (poor fit)	0.061 (good fit)	0.063 (good fit)

Table 5. Comparison of factor loadings of the three CFA models

Item	1 Factor Model	2 Factors Model		3 Factors Model		
	General	Intimate	Relational	Isolation	Collective	Relational
	Loneliness	Loneliness	Loneliness		Connectedness	Connectedness
LN2	0.688	0.730		0.730		
LN3	0.728	0.779		0.780		
LN4	0.694	0.740		0.740		
LN7	0.701	0.749		0.749		
LN8	0.548	0.621		0.621		
LN11	0.768	0.809		0.808		
LN12	0.675	0.731		0.731		
LN13	0.720	0.769		0.769		
LN14	0.836	0.872		0.872		
LN17	0.358	0.432		0.431		
LN18	0.636	0.701		0.701		
LN1_n	0.397		0.576		0.635	
LN5_n	0.499		0.647		0.710	
LN6_n	0.455		0.662		0.731	
LN9_n	0.435		0.607		0.665	
LN10_n	0.520		0.705			0.712
LN15_n	0.618		0.759			0.768
LN16_n	0.638		0.805			0.813
LN19_n	0.561		0.729			0.738
LN20_n	0.620		0.755			0.764

Figures 1, 2, and 3 describe the pictures of the three measurement models.

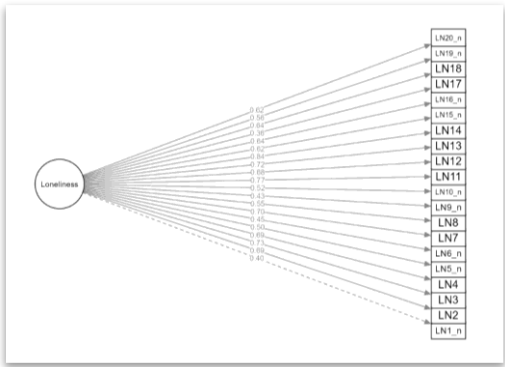


Figure 1. One-factor loneliness measurement model

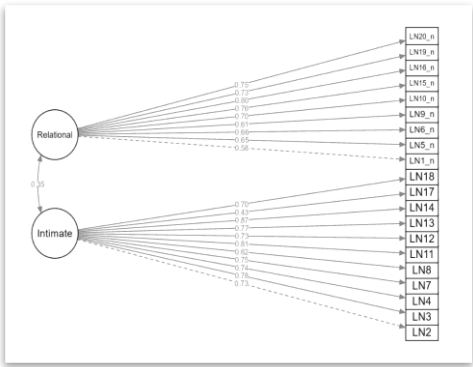


Figure 2. Two-factor loneliness measurement model

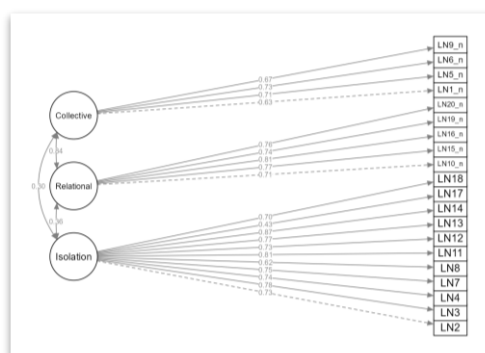


Figure 3. Three-factor loneliness measurement model

Convergent Validity and Reliability of the UCLA-LS-V3

Table 6 provides a comparison of AVE, Cronbach's alpha, and CR values.

Table 6. Comparison of AVE, Cronbach's alpha, and CR values

Model	Dimension	AVE	CR	Cronbach's Alpha
1 Factor	General loneliness	0.382	0.922	0.887
	Intimate loneliness	0.532	0.924	0.901
2 Factor	Relational loneliness	0.487	0.894	0.853
	Isolation	0.532	0.924	0.901
3 Factor	Collective connectedness	0.471	0.780	0.703
	Relational connectedness	0.577	0.872	0.819

Based on the results, the one-factor model showed an AVE value of 0.38, which is considered as poor convergent validity. However, the model's reliability remained relatively high, with CR = 0.922 and Cronbach's alpha = 0.887.

In the two-factor model, only one dimension, the intimate loneliness dimension, had good convergent validity, with an AVE of 0.532. Meanwhile, the dimension of relational loneliness had an AVE of 0.487, which is below the ideal value. However, the dimensions of Intimate Loneliness and Relational Loneliness

both showed good reliability, with CR values of 0.924 and 0.894, and Cronbach's alpha values of 0.91 and 0.853, respectively.

The three-factor models of the UCLA-LS-V3 consisted of two dimensions: relational connectedness and isolation. Both dimensions showed good convergent validity, with AVE values of 0.577 and 0.532 for relational connectedness and isolation, respectively. Nevertheless, the collective connectedness dimension had an AVE of 0.471, which is below the ideal limit. The three-factor model showed good reliability across all dimensions,

with CR values ranging from 0.780 to 0.924 and Cronbach's alphas ranging from 0.703 to 0.901.

In general, the results of this study indicate that the two- and three-factor models provide better and more reliable structures than the one-factor model. There were differences in the convergent validity values across the one-, two-, and three-factor models. The overall results showed that the one-, two-, and three-factor models had Cronbach's alpha values > 0.7, which is considered acceptable.

CONCLUSIONS

The present study concluded that loneliness, as measured by the UCLA-LS-V3, is better explained by a two- or three-factor model. A one-factor model of the UCLA-LS-V3 cannot explain the data in the Indonesian cultural context, as Russell's (1996) findings in the Western context.

DISCUSSION

This study found that the two- and three-factor models of the UCLA-LS-V3 had a much better fit than one-factor models. Therefore, this study did not support a one-factor structure for the UCLA-LS-V3, as reported by Russell (1996). Research has demonstrated mixed results showing that the loneliness construct is more appropriately described multidimensionally or with more than one factor structure, including in previous research by Giri and Dubey (2025), Kwiatkowska et al. (2018), Lee et al. (2021), Ozdemir and Tan, (2024), Wongpakaran et al. (2020), and Zarei et al. (2016). The present

results were consistent with previous research, which found the UCLA-LS-V3 could be described multidimensionally, either in two-factor structures (intimate loneliness and relational loneliness) or three-factor structures (isolation, collective connectedness, and relational connectedness). This study supported the finding that loneliness is experienced differently across cultures, with greater loneliness associated with greater individualism (Barreto et al., 2021). According to a study, the most widely used loneliness scales, including the UCLA Loneliness Scale, measure the construct in general, without accounting for the factors that influence loneliness (Pérez-Lara et al., 2025). In collectivist cultures, individuals are encouraged to consider the collective good rather than pursuing self-interest, and bonding to family tends to be stronger (Yang, 2023). They are also more concerned with serving others (Feist et al., 2018), which is relevant to the factors of relational loneliness, collective connectedness, and relational connectedness in this study. Identifying factors associated with loneliness is crucial for designing effective interventions to improve social relationship functioning and thereby reduce loneliness (Lindsay et al., 2019).

The two- and three-factor models showed fit indices of CFI (0.914, 0.914), TLI (0.902, 0.903), and SRMR (0.061, 0.063), respectively, all within acceptable ranges. However, in both models, the fit indices did not fully meet the ideal criteria. The chi-square test was significant ($p < 0.05$), indicating poor fit. This condition is very common in large samples because the chi-square test is highly sensitive to

sample size and should not be used as the sole basis for assessing model fit (Hair et al., 2019; Kline, 2016). Furthermore, the RMSEA values for the two- and three-factor models exceeded the ideal limit of < 0.08 (Hu & Bentler, 1999). However, an RMSEA value between 0.08 and 0.1 is still within the acceptable marginal limit (Browne & Cudeck, 1992). The RMSEA values for the two-factor (0.092) and three-factor models (0.091) in this study were much better than the one-factor model, with an RMSEA value of 0.157.

This research confirmed the validity of the UCLA-LS-V3 for measuring loneliness in the Indonesian emerging adult context. The convergent validity test indicated dimensions with less-than-optimal values in the two-factor and three-factor models. In the three-factor model, the collective connectedness dimension has an AVE of 0.471, and in the two-factor model, the relational loneliness dimension has an AVE of 0.487. An AVE value < 0.5 indicates that most of the variation in the items does not originate from the main factor being measured, but rather due to measurement error (Hair et al., 2019).

Results of the present study indicated that the UCLA-LS-V3 is a reliable measure of loneliness. The reliability test for the one-, two-, and three-factor models yielded Cronbach's alpha values > 0.7 , which meets the minimum criterion. Similarly, the reliability test using CR showed a CR value > 0.7 , which is considered high for the one-, two-, and three-factor models. Therefore, it can be concluded that the UCLA-LS-V3 has good internal consistency, which

means that all items measure the same latent construct (Hair et al., 2019).

This study found that both the two- and three-factor models of the UCLA-LS-V3 had adequate fit to the data, with good fit for SRMR and acceptable fit for CFI and TLI, but acceptable marginal limits for RMSEA. However, the scale's one-factor model had a poor fit to the data. These results partially support the study of the UCLA-LS-V3 in Indian samples, which found satisfactory fit for all fit indices in the three-factor model, and acceptable fit for CFI and TLI (Giri & Dubey, 2025). The current study found good reliability, as did the Hindi version of the scale (Giri & Dubey, 2025).

Several recommendations for future research are proposed based on the findings and limitations of this study. First, it is recommended that future research involve a more diverse range of population groups. Future research should also consider other age groups, such as adolescents, middle-aged adults, the elderly, or other groups vulnerable to loneliness. This is essential to ensure that the UCLA-LS-V3 provides a valid and reliable measure across different groups in the Indonesian context. Additionally, future research should investigate the validity evidence of the UCLA-LS-V3 by exploring the associations between loneliness and other relevant variables, such as depression, anxiety, and quality of life.

Although the UCLA-LS-V3 is frequently used in research, previous studies showed that the scale still lacks a definitive factor structure (Da Mata et al., 2022). A cross-

cultural study found that the one-, two-, and three-factor structure of the 20-item scale did not meet the model fit cut-off criteria in the sample of Indonesian, United States, and Germans (Hudiyana et al., 2021). This result supported the UCLA-LS-3's cross-cultural adaptation research in adults, which observed inconsistencies in the scale's factor structure (Alsubheen et al., 2023).

The present study found that the UCLA-LS-V3 is better explained by a two- and three-factor model in the sample of Indonesian emerging adults. This result supported Giri and Dubey's (2025) research on the UCLA-LS-V3 that the model consisted of two factors and three-factor models fit the data better, whereas the one-factor model did not fit the data from universities and communities in India. According to Takács et al. (2024), although loneliness is theoretically considered a global construct, the subjective aspects raised the possibility of the dimensionality of loneliness. The present study makes an important contribution to understanding loneliness among emerging adults in the Indonesian context and contributes to the cross-cultural studies of the UCLA-LS-V3, which still found inconsistencies in the scale's factor structure.

Arnett (2016) asserts the consistency of the characteristics of emerging adulthood in different social classes. However, prior research has often overlooked developmental theory when selecting samples. The present study employed criteria for emerging adulthood (Arnett, 2016), and found that the UCLA-LS-V3 is better explained by two- and three-factor models. These findings differ from previous

cross-cultural studies that included different age samples, such as older individuals (Da Mata et al., 2022). This study contributes theoretically by highlighting the developmental stages when using the UCLA-LS-V3.

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