

SHORT REPORT

Analysis of the psychometric properties of the Revised UCLA Loneliness Scale in a Polish adolescent sample

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The current study examines the psychometric properties of the Revised UCLA Loneliness Scale (R-UCLA): structural validity, reliability and external validity. We conducted a study on a sample of 247 high school students, all aged 16. In order to verify the hypotheses, scales measuring feelings of loneliness, shyness and self-esteem were administered. As a result of confirmatory factor analyses, it was demonstrated that the structure of the R-UCLA is three-factorial, the factors being as follows: (1) intimate others, referring to the feeling of exclusion; (2) social others, referring to the

lack of closeness and support in relationships; and (3) belonging and affiliation, referring to the lack of community bonds – all of which are reliable in their measurement, as is the total score of the R-UCLA. Moreover, we demonstrated that the feeling of loneliness is positively related to shyness and negatively related to self-esteem. The obtained results support using the R-UCLA among Polish adolescents.

KEY WORDS

loneliness; adolescents; shyness; self-esteem

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BACKGROUND

DEFINITION OF LONELINESS

Loneliness is a widespread social problem which is commonly experienced regardless of race, gender, age or cultural background (Rokach & Neto, 2000). People, as social beings involved in relationships, are obviously open to the possibility of feeling lonely. Such a situation may occur in cases of isolation from others when meaningful relationships take a negative turn, or it can be a result of individuals' attitude to society (Rokach & Neto, 2000). Perlman and Peplau (1981), together with Russell et al. (Russell, Peplau, & Cutrona, 1980; Russell, Peplau, & Ferguson, 1978), define loneliness through common themes, which characterize the phenomenon of feeling lonely as a specific experience of an unpleasant nature, the cause of which lies in quantitative or qualitative impoverishment of individuals' social relations; they also understand the feeling of loneliness as a discrepancy between desired and actual social relationships (Russell et al., 1980). Although loneliness seems to be a unidimensional construct on the surface, it may have many different faces, because all of the symptoms characteristic for the feeling of loneliness can be grouped together in lower-order factors, and consequently it is possible to distinguish its types depending on the assumed criterion, e.g. feeling of loneliness at the individual and group level (which will be further developed in the part regarding the measure dimensionality).

METHODS OF MEASURING LONELINESS

Two self-report methods are commonly used and dominate in measuring the feeling of loneliness: the 11-Item De Jong Gierveld Loneliness Scale (DJGLS; De Jong-Gierveld & Kamphuis, 1985) and the UCLA Loneliness Scale (Russell, 1996; Russell et al., 1980). What is common between these two measures is the fact that they both treat loneliness as a construct which is not superficial and trivial, but rather its nature and structure are complex (De Jong-Gierveld & Kamphuis, 1985; Russell et al., 1980). The first, DJGLS scale is a short tool to measure the feeling of loneliness, which pertains to a subjective perception of the situation of isolation or lack of appropriate communication with others (De Jong-Gierveld & Kamphuis, 1985); however, the scale can be used to measure the feeling of loneliness either as a global experience or as a multidimensional phenomenon with two different faces (an emotional and social one; De Jong-Gierveld & Kamphuis, 1985; Grygiel, Humenny, Rebisz, Świtaj, & Sikorska, 2013).

The second scale has three successive versions: UCLA Loneliness Scale Version 1 (Russell et al., 1978), the Revised UCLA Loneliness Scale (R-UCLA; Russell

et al., 1980), and UCLA Loneliness Scale Version 3 (UCLA Version 3; Russell, 1996); the latter two versions are the result of improving the measure. The R-UCLA and UCLA Version 3 do not differ much from each other, because the only difference is the character of formulating the test items: in R-UCLA they are formed as declarative sentences, while in UCLA Version 3 they are formed as questions. In the current study, we decided to use the R-UCLA scale, which is one of the most often used measures of loneliness (De Jong-Gierveld & Kamphuis, 1985; Russell et al., 1980). We find it to be a promising alternative to the DJGLS due to the longer tradition of using the measure and wider range of previous research with its use. The R-UCLA scale is slightly longer than the DJGLS, as it contains 20 items reflecting satisfaction and dissatisfaction with social relationships; however, half of them are positively worded. In previous analyses (Russell et al., 1980), each item had a discriminating power higher than .40 and as in the previous and later version, the reliability was perfect ($\alpha = .94$). Although it was originally developed as a unidimensional measure (Russell et al., 1980), recent research suggests more complex interpretation possibilities, i.e., treating loneliness as a construct established through two or the three distinct factors (Austin, 1983; Hawkey, Browne, & Cacioppo, 2005; Wilson, Cutts, Lees, Maungwana, & Maunganidze, 1992).

On one hand, Wilson et al. (1992) argued that the R-UCLA scale comprises two factors: (1) intimate other, which refers to the lack of intimate close relationships, and (2) social network, which refers to the lack of group relationships (i.e. with friends from school or colleagues from work). Both of these included 10 items; however, the main basis of their distinction lies in the item wording, making the theoretical distinction difficult, even if possible. The proposed content (Wilson et al., 1992) is similar in its operationalization to the dimensional concept of the feeling of loneliness (emotional and social) represented also by the DJGLS scale (De Jong-Gierveld & Kamphuis, 1985), but in the light of these methodological limitations, this proposition seems to be less suited for research than the DJGLS.

On the other hand, Austin (1983) proposed that loneliness can be defined not by two, but by three factors. These three factors of loneliness can be described as follows: (1) intimate others, which refers to solitude, rejection, withdrawal, feeling of exclusion and the breaking of social relations with other people; it is related to the unpleasant feeling of solitary confinement and being alone in the literal meaning of the word; (2) social others, which refers to not having a social network to connect with and lack of the feeling of closeness in relation with other people (in terms of their availability); it refers to the lack of contact with close relatives or trusted people who form a sense of safety and support; and (3) belong-

ing and affiliation, which refers to a lack of a sense of group identity (affiliation) and bonds with a community; it refers to the weaker links with a social group and feeling more like an individual than a part of a group (Austin, 1983; Hawkley et al., 2005). In more recent studies, this model also gained support in the data with minor differences concerning e.g. items 4 and 10 (Hawkley et al., 2005). The R-UCLA scale in the three-factorial solution was found to be universal, i.e., there is the same conceptual representation across younger and older adults, gender, and ethnicity, which may have a basis in the fact that if people want to survive they need to communicate and cooperate at several rungs of social organization (e.g., fit to the social world, interpersonal connectedness in dyads, and collective-self associated with social domain; Hawkley et al., 2005). Owing to the universality of the three-factor definition of loneliness, one can hypothesize that this conceptualization may be deemed as a promising alternative to the DJGLS in the measurement of the multidimensional construct of loneliness.

THE RELATIONSHIP BETWEEN LONELINESS, SELF-ESTEEM AND SHYNESS AS AN INDICATOR OF MEASUREMENT VALIDITY

In most of the previous studies it was demonstrated that people feeling lonely have lower self-esteem (Dzwonkowska, 2011; Hu, Jin, Hu, & He, 2013), while shyness in turn is described as a significant correlate and predictor of loneliness; there is also evidence for a strong positive relationship between shyness and feeling of loneliness among students (Dill & Anderson, 1999; Jackson, Fritch, Nagasaka, & Gunderson, 2002). Moreover, Kwiatkowska, Kwiatkowska and Rogoza (2016) revealed that being in a relationship with another person significantly affects both levels of shyness and feeling of loneliness. This research supports that when trying to start an interpersonal relationship shyness starts to act like 'a brake', causing embarrassment and resulting in abandonment of engagement in new relationships and a heightened feeling of loneliness. Based on previous research, there is strong evidence to link feelings of loneliness, lower self-esteem, and shyness. It forms a kind of configuration, in which each variable has a significant impact on the other two; therefore, these variables can be mutually used to assess the external validity of self-report methods designed to measure one of the interesting variables.

CURRENT STUDY

The goal of the current paper is to assess the psychometric properties the R-UCLA scale in Polish adolescents: (1) structural validity, (2) reliability, and (3) external validity. We hypothesize that:

1. The three-factorial model is the most structurally valid model of the measure. Our hypothesis is supported by several studies demonstrating that the three-factorial solution seems to be optimal according to feeling of loneliness measured by the R-UCLA scale (Austin, 1983; Hawkley et al., 2005). Because the R-UCLA comprises only four response categories, the data were treated as categorical. All of the confirmatory factor analyses (CFA) were run on polychoric correlation matrices using weighted least squares means and variance adjusted (WLS-MV) estimator. The approximate fit was assessed using two model fit indices: the comparative fit index (CFI) and root mean square error of approximation (RMSEA). The model is deemed as well fitted to the data when the CFI is larger than .95 and the value of RMSEA alongside its upper interval is smaller than .06 (Hu & Bentler, 1999).
2. The Polish version of the R-UCLA scale is reliable. Our hypothesis is supported by the results of previous research, where R-UCLA has been recognized as a reliable measure (Hawkley et al., 2005; Russell et al., 1980; Wilson et al., 1992), as well as its previous and subsequent version. The reliability will be tested using McDonald's (1999) ω coefficient. The interpretation of the McDonald's (1999) ω coefficient is in line with the interpretation of the popular Cronbach's α estimate, i.e. the higher the value of the estimate is, the more reliable is the measurement. The ω coefficient should be preferred over α for at least several reasons; for a more technical review of this issue see Sijtsma (2009).
3. The Polish version of the R-UCLA scale is externally valid, which will be tested using Pearson's correlations with measures of shyness and self-esteem, which, according to previous studies (Dill & Anderson, 1999; Dzwonkowska, 2011; Hu et al., 2013; Jackson et al., 2002; Kwiatkowska et al., 2016), seems to be strongly related to the feeling of loneliness.

METHOD

PARTICIPANTS AND PROCEDURE

The study was attended by 247 first-grade high-school students (60.32% were girls), most aged 16 ($M_{\text{age}} = 15.96$; $SD = 0.23$); therefore, the results of the current study need to be treated with caution. Students completed a set of self-report measures. Research took place during school hours with the consent of parents and headmasters.

MEASURES

In the current study we used three self-report measures: (1) the R-UCLA scale (Russell et al., 1980); it

Table 1
Model fit indices of the competing structural models of the R-UCLA scale

Model	Number of factors	χ^2	p	CFI	RMSEA	90% CI
Russell et al., 1980	1	621.16 ₍₁₇₀₎	.001	.909	.104	.095-.112
Wilson, Cutts, Lees, Mapungwana, & Maunganidze, 1992	2	462.15 ₍₁₅₁₎	.001	.933	.091	.082-.101
Austin, 1983	3	323.84 ₍₁₆₆₎	.001	.968	.062	.052-.072

is a scale to measure loneliness as a trait; it consists of 20 items and a 4-point response scale; we made the reverse translation by an English lecturer and consulted our translation with one of the authors of the scale; (2) the Rosenberg Self-Esteem Scale in the Polish adaptation of Łaguna, Lachowicz-Tabaczek, & Dzwonkowska (RSES; 2007); it is a reliable ($\omega = .93$; $\alpha = .89$) scale to measure self-esteem; it consists of 10 items and a 4-point response scale; (3) the Revised Cheek and Buss Shyness Scale in the Polish adaptation of Kwiatkowska et al. (RCBS; 2016); it is a reliable ($\omega = .93$; $\alpha = .91$) scale to measure shyness as a trait; it consists of 13 items and a 5-point response scale; moreover, it was demonstrated that the scale is invariant between adults and adolescents (Kwiatkowska & Rogoza, 2017).

Both the one- and two-factor models were poorly fitted to the data as assessed by RMSEA, whereas the three-factor model yielded a very good fit to the data. These results confirm that loneliness as measured by the R-UCLA has a more complicated factorial structure.

The standardized factor loadings and factor correlations of the three-factor R-UCLA model, and additionally also the standardized factor loadings from the unidimensional model, are presented in Figure 1.

The standardized factor loadings of all items in the three-factor model (except for item 4) were greater than .40 (item 15 was at the boundary), which confirms our expectations about the structural validity of the Polish version of the R-UCLA scale. The fourth item turned out to be problematic as it barely loaded the third factor; therefore we decided to discuss further its application in the R-UCLA scale.

RESULTS

STRUCTURAL VALIDITY OF THE R-UCLA SCALE

The results of competing CFA models varying in the number of factors (from one to three factors; models 1, 2 and 3) are presented in Table 1.

RELIABILITY

On the basis of reliability estimates the total score and each of the examined scales are characterized by very good reliability ($\omega_{\text{Total Score}} = .92$; $\omega_{\text{Intimate Others}} = .90$; $\omega_{\text{Social Others}} = .83$; $\omega_{\text{Belonging and Affiliation}} = .80$), which

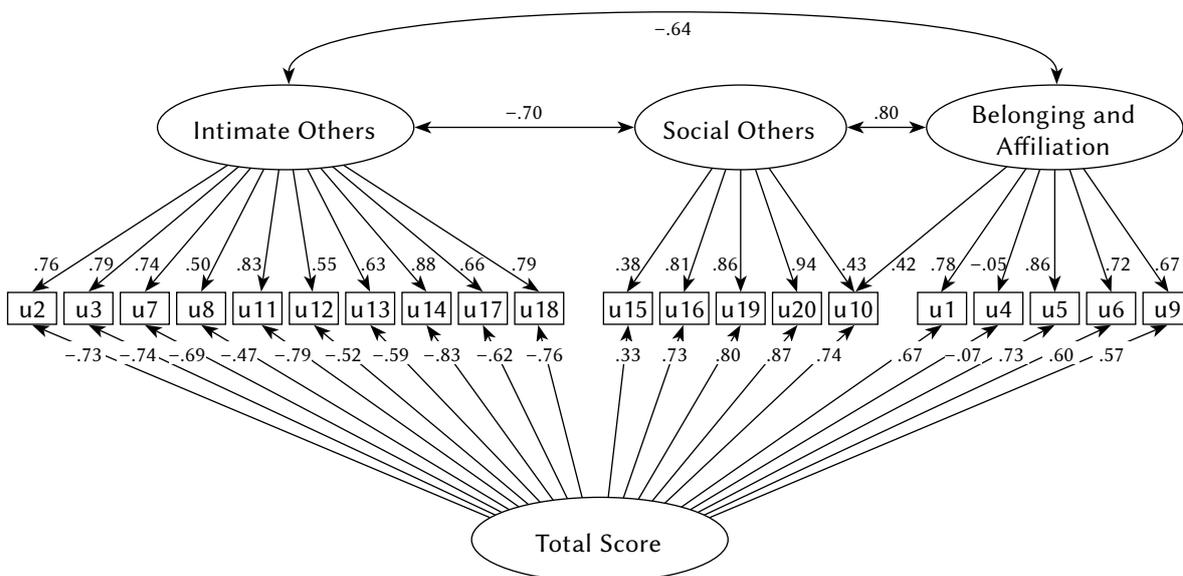


Figure 1. Standardized factor loadings of the R-UCLA scale in adolescent sample.

confirmed our hypothesis concerning reliable measurement of loneliness among adolescents using the R-UCLA scale.

EXTERNAL VALIDITY

To test whether the scales distinguished in the R-UCLA scale are valid, we correlated our results with external measures of shyness and self-esteem; the results are presented in Table 2.

Our expectations were confirmed, because intimate others was positively related with shyness, and the factors social others and belonging and affiliation were negatively related to shyness. Therefore, one can conclude that the Polish version of the R-UCLA scale is a valid measure of loneliness.

DISCUSSION

In the current study we scrutinized the psychometric properties of the R-UCLA scale (Russell et al., 1980) in an adolescent sample by assessing the structural validity, reliability and external validity of the scale. As several different structural models of the R-UCLA exist within the literature (Austin, 1983; Wilson et al., 1992), we decided to assess each of the competing models. It turned out that the three-factor proposition best represented the structure of the measure among Polish adolescents. Despite this being the best fitted model, we revealed some measurement problems with the fourth item (*I do not feel alone*), which did not load on assumed factor and did not even correlate with the total score. The issue concerning this item is evident in the R-UCLA research as it was loading different factors in other studies (Hawley et al., 2005); thus this problem was expected to occur. A potential source of this problem may lie in the direct wording of the item, which may in turn lead to the ceiling effect distorting the result; thus, we propose excluding this item from the scale. As apparent from being structurally valid, each of the distinguished scales as well as the overall score turned out to be very reliable in its measurement, thus confirming our expectations.

Finally, our last tested aspect of psychometric properties of the R-UCLA (Russell et al., 1980) concerned the validity with the external measures. As an indicator of external validity, we decided to replicate the results regarding two variables associated with loneliness, i.e. shyness and self-esteem. In the current study our results provided support for the view that loneliness is positively related to shyness and negatively related to self-esteem; this is in line with the results provided in the literature (Dill & Anderson, 1999; Dzwonkowska, 2011; Hu et al., 2013; Jackson et al., 2002; Kwiatkowska et al., 2016). To summarize,

Table 2

Correlation between R-UCLA subscales in three-factorial solution (intimate others, social others, belonging and affiliation) and shyness and self-esteem

Scale	Shyness	Self-esteem
Intimate Others	.52*	-.44*
Social Others	-.37*	.22*
Belonging and Affiliation	-.37*	.25*

Note. * $p < .001$.

the Polish version of the R-UCLA scale (Russell et al., 1980) may be deemed as a valid and reliable measure of different aspects of feeling of loneliness in the population of Polish adolescents, which can be particularly useful in future studies concerning measurement invariance of feeling of loneliness across adults and adolescents, as in the case of shyness and self-esteem measurement, where the RCBS and RSES scales were found to be comparable across age (Kwiatkowska & Rogoza, 2017; Łaguna et al., 2007).

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APPENDIX

R-UCLA Loneliness Scale/Skala samotności R-UCLA

The following statements vary from person to person. Indicate how often each statement describes you in accordance with the meaning given below:

Poniżej zebrano stwierdzenia, które w różnym stopniu dotyczą każdego człowieka. Wskaż, jak często każde z poniższych stwierdzeń opisuje Ciebie zgodnie z podanym poniżej znaczeniem:

- ① – never/nigdy
- ② – rarely/rzadko
- ③ – sometimes/czasami
- ④ – often/często

No./Lp.	Test item	Pozycja testowa	Response scale/ Skala odpowiedzi
1.	I feel in tune with the people around me	Dobrze się czuję z ludźmi wokół mnie	① ② ③ ④
2.	I lack companionship	Brakuje mi towarzystwa	① ② ③ ④
3.	There is no one I can turn to	Nie mam nikogo, do kogo mógłbym się zwrócić	① ② ③ ④
4.	I do not feel alone	Nie czuję się samotny	① ② ③ ④
5.	I feel part of a group of friends	Czuję się częścią grupy przyjaciół	① ② ③ ④
6.	I have a lot in common with the people around me	Mam wiele wspólnego z ludźmi wokół mnie	① ② ③ ④
7.	I am no longer close to anyone	Już nie jestem dla nikogo bliską osobą	① ② ③ ④
8.	My interests and ideas are not shared by those around me	Moje zainteresowania nie są podzielane przez ludzi wokół mnie	① ② ③ ④
9.	I am an outgoing person	Jestem osobą towarzyską	① ② ③ ④
10.	There are people I feel close to	Są ludzie, którzy są mi bliscy	① ② ③ ④
11.	I feel left out	Czuję się opuszczony	① ② ③ ④
12.	My social relationships are superficial	Moje relacje społeczne są powierzchowne	① ② ③ ④
13.	No one really knows me well	Nikt tak naprawdę nie zna mnie dobrze	① ② ③ ④
14.	I feel isolated from others	Czuję się odizolowany od innych	① ② ③ ④
15.	I can find companionship when I want it	Potrafię znaleźć towarzystwo, kiedy tylko chcę	① ② ③ ④
16.	There are people who really understand me	Są ludzie, którzy naprawdę mnie rozumieją	① ② ③ ④
17.	I am unhappy being so withdrawn	Jestem nieszczęśliwy z powodu bycia zamkniętym w sobie	① ② ③ ④
18.	People are around me but not with me	Ludzie są wokół mnie, ale nie ze mną	① ② ③ ④
19.	There are people I can talk to	Są ludzie, z którymi mogę porozmawiać	① ② ③ ④
20.	There are people I can turn to	Są ludzie, do których mogę się zwrócić	① ② ③ ④

Recoded items/Pozycje odwrócone: 1, 4, 5, 6, 9, 10, 15, 16, 19, 20.

Intimate others: 2, 3, 7, 8, 11, 12, 13, 14, 17, 18.

Social others: 10, 15, 16, 19, 20.

Belonging and affiliation: 1, 4, 5, 6, 9, 10.