

# Analysis Construct Validity And Reliability Of Loneliness Scale

Anisatul Muawanah, Fatwa Tentama

**Abstract:** The purpose of this study is to test the validity and reliability of the loneliness as a variable and examine the aspects and indicators that can form this particular variable. Loneliness is measured by three aspects, namely personality, social desirability, and depression. The population in this study were all semester two students at "X" University in Yogyakarta. The sample in this study were 60 students who weren't originally from Yogyakarta and who were in semester two at the "X" University in Yogyakarta. The sampling technique used is an accidental sampling. Data collection method uses loneliness scale. The research data were analyzed with Structural Equation Modeling (SEM) through the SmartPLS 3.2.8 program. Based on the results of data analysis, the aspects and indicators that make up the loneliness variable are declared valid and reliable. The dominant aspect that reflects loneliness is depression with a loading factor of 0.813, and the weakest aspect is personality, which has a loading factor value of 0.805. This shows that all aspects and indicators can reflect and shape the loneliness variable. Thus, the measurement model can be accepted because the theory describes the loneliness fit variable with empirical data obtained from the subject.

**Keywords:** Loneliness, Personality, Social Desirability, Depression, Construct Validity, Construct Reliability

## 1 INTRODUCTION

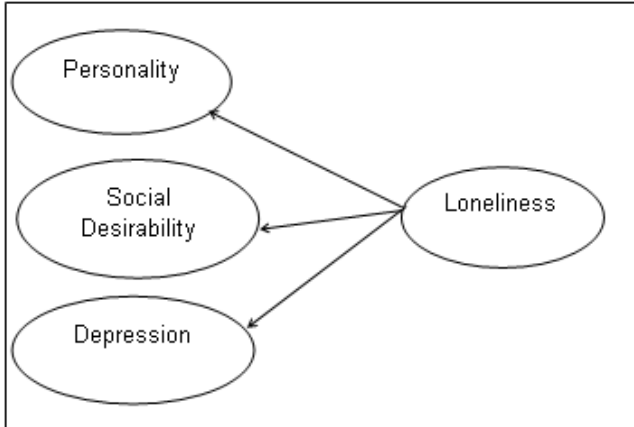
Psychological pressure is dangerous for every individual [1]. The results of research by Lenze, Schulz, Martire, Zdaniuk, Glass, Kop, and Reynolds [2] show that one of the causes of individual psychological distress is the least amount of social contact and social involvement. The lack of someone's social contact can make them feel lonely, and loneliness is one predictor for individual suffering [1]. According to Masi, Chen, Hawkey, and Cacioppo [3] loneliness is something that is not liked by everyone. However, changing social and demographic trends make more and more adults at risk of feeling lonely [4]. According to Heinrich and Gullone [5], the phase of development of late adolescents who have just entered university has a higher level of loneliness than other development phases. Overseas students often feel feelings of loneliness. This is because they have to live alone, so they tend to have few social networking ties and have minimal social contact [6]. Loneliness is a very important indicator of the quality of life of individuals when entering the transition to college. Loneliness reflects the basic human need for attachment and ownership [7]. Cacioppo and Cacioppo [8] argue that loneliness is related to social limitations and mental health of individuals. Loneliness has an impact on student difficulties in academic adjustment because it makes students reluctant to further explore the environment [7]. Loneliness is associated with personality disorders, psychosis, increased likelihood of Alzheimer's disease, reduced executive control [9], decreased cognitive function [10], and increased symptoms of depression and suicidal ideation [11].

Loneliness is positively correlated with poor health behavior [6], decreased immunity [12], anxiety experiencing peer rejection [13], distress and depression [14]. There are various factors that can cause loneliness. These factors include environmental factors [15] internet addiction [16], low trust and fear of negative evaluations [17], difficulty building meaningful social relationships [18], rejection or isolation by the social environment [19]; [20], depression [21], and negative stigma about loneliness itself [22]. Overseas students often feel lonely because they are far from their closest people, such as family and friends. The distance from parents makes them often feel sadness, solitude, and lack of direct support from the family when they face difficult times in each phase of the college. In addition, a new environment with a different cultural background also makes students need time to adapt. Furthermore, they will usually have difficulty in building trust with new people, so they often feel isolated from the environment. This is reinforced by the opinions of Cacioppo, Grippo, London, Goossens, and Cacioppo [23], which states that individuals who live apart from family and friends are more at risk of feeling lonely. The concept of loneliness began to be the focus of attention since the 1980s [24]. The concept of loneliness is related to pathological behaviour caused by personal and interpersonal stresses [25]. Although loneliness in its development is considered a common condition, to some extent, it can cause psychological distress [26]. Along with the development of a new era, loneliness rate continues to increase, especially in the elderly and young people who feel marginalize [27]. Russell, Peplau, and Cutrona [28] developed the loneliness theory model using multidimensional concepts as phenomena which have unity with various circumstances. Then, Heinrich and Gullone [29] state that it is not possible to express complex associations directly because the concept of loneliness might be different from other feelings. However, the results of Goossens et al.'s [30] study reinforce that the loneliness construct is a multidimensional construct that is often revealed when observing the factors of loneliness itself. Maes, Klimstra, van de Noortgate, and Goossens [31] argue that the explanation of the multidimensional construct of loneliness will offer a comprehensive picture. Loneliness is a condition where there is a difference between the desired social relationship of individuals with actual social relations [32]. This discrepancy then leads to negative experiences in the form of feeling alone and or depressed because they are

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experiencing social isolation [33]; [34]. According to Schultz and Moore [35], loneliness is a subjective social and emotional experience as a result of differences in desired social relations and reality. Loneliness is a condition that describes distress, feelings of depression, and feelings of separation that are felt by individuals when experiencing emptiness in life because of unfulfilled social or emotional desires [36]. Loneliness can also be defined as an unpleasant feeling that reflects an individual's dissatisfaction with the subjective and emotional aspects of his social life [37]. Recent research on loneliness shows that it can affect anxiety, depression, and social phobia [38]; [39]; [40]. Loneliness also makes individuals biased negative thoughts about their environment [41], making shorter sleep times and other sleep problems [42], giving rise to feelings of social isolation [43], and are predictors of suicidal behaviour [44]. According to Russell, Peplau and Cutrona [45], loneliness is based on three aspects namely, 1) The personality aspect, the dynamic organization in individuals of the psychophysical system that determines behavioural and thinking characteristics that are symbolized by feelings of inferiority, discomfort, anxiety, and passivity. 2) Social desirability aspects, namely the individual's need to integrate and be accepted by the social environment in which the individual lives with the behaviour of not feeling accepted in the surrounding environment, excluded by group members, and boredom. 3) aspects of depression, are attitudes and feelings characterized by feelings of worthlessness, lack of enthusiasm, depressed, sad heart and tend to failure which is described by sad behaviour, depressed, lost enthusiasm, self-blame, emptiness, and leads to acts of suicide.



**Fig. 1.** Conceptual model of loneliness

Based on figure 1 above, the hypotheses in this study states that aspects of personality, social desirability, and depression are capable of forming loneliness variables. One approach that can be used in testing the construction of a measuring instrument is Confirmatory Factor Analysis (CFA). Confirmatory Factor Analysis (CFA) is one of the main approaches in factor analysis. CFA can be used to test aspects of a construct. This test is used to perform model measurements so that it can describe aspects in reflecting latent variables, namely loneliness, by looking at the loading factor of each aspect that forms a construct. Confirmatory Factor Analysis (CFA) is also used to test the validity of the extract and the reliability of the extracts from the indicators (items) forming latent constructs [46]. Confirmatory Factor

Analysis (CFA) used in this study is the second-order CFA, a measurement model that consists of two levels. The first level of analysis is carried out from aspects to its indicators, and the second analysis is carried out from latent variables to its aspects [46]. Based on the description above, the formulation of the problems in this study are 1) Is the loneliness scale valid and reliable?; 2) Are the aspects of personality, social desirability, and depression able to form loneliness variables?. The purpose of this study is to: 1) Test the validity and reliability of the loneliness scale and 2) Test the aspects and indicators that can form the loneliness variable.

## 2 RESEARCH METHOD

### 2.1 Population, Sample, and Sampling Technique

The population in this study were all semester two students at "X" University in Yogyakarta. The sample in this study were 60 overseas students in semester two at the "X" University in Yogyakarta. The sampling technique used is an accidental sampling.

### 2.2 Data Collection Method

Loneliness is measured using a loneliness scale with a differential semantic form. The scale of this study was compiled by researchers with reference to aspects of loneliness, according to Russell [28], namely personality, social desirability, and depression. Examples of items from each aspect can be seen in the following table:

**TABLE 1**  
THE EXAMPLE OF PERSONALITY ASPECT ITEM

<i>I am ...</i>						
<i>Brave</i>	1	2	3	4	5	<i>Coward</i>
<i>Enthusiastic</i>	1	2	3	4	5	<i>Safe</i>

**TABLE 2**  
THE EXAMPLE OF SOCIAL DESIRABILITY ASPECT ITEM

<i>When in a social environment, I feel</i>						
<i>Calm</i>	1	2	3	4	5	<i>Nervous</i>
<i>Cared for</i>	1	2	3	4	5	<i>Not cared for</i>

**TABLE 3**  
THE EXAMPLE OF DEPRESSION ASPECT ITEM

<i>When facing a problem, I am...</i>						
<i>Patient</i>	1	2	3	4	5	<i>Pressured</i>
<i>Accepting it</i>	1	2	3	4	5	<i>Blaming myself</i>

The blueprint that is used as a reference in the preparation of the scale can be seen in table 4.

**TABLE 4**  
BLUE PRINT OF THE LONELINESS SCALE

Aspect	Behaviour Indicators	Item Numbers	Total
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Personality	1. Feel inferior	1,2,3,4,5,6	6
	2. Feel uncomfortable and anxious		
	3. Having unpleasant experiences and feelings		
	4. Behave in a passive and unresponsive manner with others		
Social Desirability	1. Feeling not accepted in the surrounding environment	7,8,9,10,11,12	6
	2. Always feel alone even in crowded places		
	3. Feeling out without contact with certain groups/organizations		
	4. Individuals feel bored with the current environment		
Depression	1. Feel sad, depressed or discouraged	13,14,15,16,17,18	6
	2. Tend to blame yourself / feel sorry for yourself		
	3. Feel empty or empty \		
	4. Leads to suicide		
Total		18	18

**2.3 Validity and Reliability**

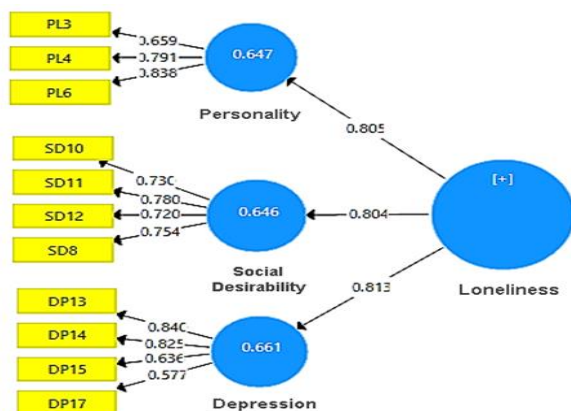
To test the validity of the construct and the reliability of the construct in this study, the researcher used the outer model testing through the smartPLS 3.2.8 program. Validity testing consists of tests of convergent validity and discriminant validity. The convergence validity can be seen from the loading factor value > 0.5 and the value of Average Variance Extracted (AVE) > 0.5 [47], while the discriminant validity can be seen from comparing the roots of Average Variance Extracted (AVE) between aspects. It must be higher than the correlation with other aspects [47]. While reliability testing consists of Cronbach alpha test and composite reliability > 0.7 [47].

**2.4 Data Analysis**

The data in this study were analyzed using the 2nd Order CFA through the SmartPLS 3.2.8 program. According to Abdillah and Hartono [48], PLS is a variant-based Structural Equation Model (SEM) that can simultaneously test measurement models to test validity and reliability.

**3 RESULT**

The results of the analysis of the outer model test on the loneliness scale conducted using the SmartPLS 3.2.8 program can be seen in Figure 2 below.



**Fig. 2.** Loneliness scale outer model

**3.1 The Validity Test Result**

**3.1 The Construct Validity Test Result**

**3.1.1 Convergent Validity**

Based on the convergent validity test on the outer model, it was found that the loading factor value from the variable to aspects was > 0.5, which means the results of the loneliness construct validity test can be said to be valid because it meets the criteria of the loading factor value. The results can be seen in table 5.

**TABLE 5**  
LOADING FACTOR VALUES (VARIABLE-ASPECT)

Aspect	Loading factor	Annotation
Personality	0.805	Valid
Social desirability	0.804	Valid
Depression	0.813	Valid

Based on the test of convergent validity on the outer model, it was found that the loading factor value from aspects to indicators was > 0.5 shown in table 6.

**TABLE 6**  
LOADING FACTOR VALUE (INDICATOR- ASPECT)

Aspect	Loading factor	Annotation
PL3	0.659	Valid
PL4	0.791	Valid
PL6	0.838	Valid
SD10	0.730	Valid
SD11	0.780	Valid
SD12	0.720	Valid
SD8	0.754	Valid
DP13	0.840	Valid
DP14	0.825	Valid
DP15	0.636	Valid
DP17	0.577	Valid

Convergent validity test results show the value of Average Variance Extracted (AVE) > 0.5. The Average Variance Extracted (AVE) value of the loneliness variable is 0.514 and the Average Variance Extracted (AVE) value of each aspect can be seen in table 7.

**TABLE 7**  
THE AVE VALUE OF LONELINESS VARIABLE

Aspect	AVE	Explanation
Personality	0.588	Valid

<i>Social desirability</i>	0.557	Valid
<i>Depression</i>	0.531	Valid

### 3.1.2 Discriminant Validity

The results of discriminant validity test show that the root value of the Average Variance Extracted (AVE) in each aspect is higher than the root value of the Average Variance Extracted (AVE) in other aspects, so the discriminant validity criteria are met. The root value of the AVE loneliness variable can be seen in table 8.

**TABLE 8**  
AVERAGE VARIANCE EXTRACTED (AVE) ROOT VALUE OF LONELINESS

Aspect	Personality	Social Desirability	Depression
Personality	0.746	0.559	0.454
Social Desirability	0.559	0.746	0.718
Depression	0.454	0.718	0.728

### 3.2 Construct Reliability Test

Based on the results of the construct reliability test, the composite reliability and Cronbach alpha > 0.7 values can be obtained so that the scale in this study is reliable.

**TABLE 9**  
THE VALUE OF COMPOSITE CONSTRUCT RELIABILITY AND CRONBACH ALPHA OF SOCIAL ANXIETY

Variable	Cronbach alpha	Composite Reliability	Annotation
Loneliness	0.763	0.841	Valid

The results of construct reliability testing with the 2nd Order Confirmatory Factor Analysis (CFA) in table 9 show that the loneliness scale has good reliability and gives the meaning that aspects that measure the loneliness variable meet unidimensional criteria [49]. This is indicated by the composite reliability value of 0.841 and Cronbach alpha 0.763. The construct validity and reliability test results in valid and reliable items that can reflect the loneliness variable, namely the items in numbers 3,4,6,8,10,11,12,13,14,15,17 while the items that are not able to reflect the loneliness variable, namely the item number 1,2,5,7,9,16,18. Based on the results of the analysis of research data using the 2nd Order Confirmatory Factor Analysis (CFA), shows that the measurement model can be accepted because all aspects can reflect the variables formed.

## 4 DISCUSSION

Based on the results of the analysis of construct validity and construct reliability, the aspects and indicators that make up the loneliness scale are declared valid and reliable. This shows that all aspects and indicators can reflect and shape the loneliness variable. The most dominant aspect which can reflect the loneliness variable is the depression aspect with a Cronbach alpha value of 0.813. Depression is shown by feeling sad, depressed and lost enthusiasm, tend to blame

self, and feel emptiness. This result is in line with statements from Petersen, Schulenberg, Abramowitz, Offer, and Jarcho [50], which states that adolescents who feel lonely will tend to experience depression. Adolescence is a period of life that is vulnerable in terms of mental condition experiencing depression caused by loneliness and self-esteem [51]. The lowest aspect that reflects the loneliness variable is the social desirability aspect with a Cronbach alpha value of 0.804. Social desirability is described by feeling uncomfortable with the surrounding environment, always feeling alone even in crowded places, feeling excluded without contact with certain groups/organizations, and feeling bored in the current environment. Findings from relevant studies indicate that the loneliness variable fulfils the reliability requirements with a Cronbach alpha value of 0.516 [52]. Another finding by Hughes, Waite, Hawkey, and Cacioppo [53] with a Cronbach alpha value of 0.720. Furthermore, Luo, Hawkey, Waite, and Cacioppo [54] and Karakose, Yirci, Uygun, and Ozdemir [55] research, obtained a Cronbach alpha score of 0.730, and the findings of Matthews, Danese, Wertz, Candice, Ambler and Terrie [56] with Cronbach alpha value of 0.630 while in this study the Cronbach alpha value obtained was 0.763. The results of this study are expected to provide an overview of the validity and reliability of the loneliness scale in the context of semester two overseas students at the University of "X" Yogyakarta so that it can be used as a reference in further research related to loneliness

## 5 CONCLUSION

Based on the analysis and discussion it can be concluded that: 1) Loneliness scale meets the validity and reliability 2) All aspects and indicators can form loneliness variables, namely personality, social depression and social desirability. The aspect that possesses a dominant influence on loneliness is social depression and the weakest aspect describing the loneliness variable is the social desirability aspect. In this study, a loneliness scale measurement model was formed in accordance with empirical data obtained from subjects at the study site.

## 6 ACKNOWLEDGEMENT

The author would like to thank Ahmad Dahlan University and the Master of Psychology Programme University of Ahmad Dahlan for supporting the implementation of this research.

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