

Analysis of Validity and Reliability of the Subjective Well-being Scale

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ABSTRACT: The purpose of this study is to examine the construct validity and reliability of the subjective well-being scale and test the components and indicators that make up the subjective well-being variables. Subjective well-being is measured by two components, namely life satisfaction and affective (positive and negative affect). The present study utilized the data collection method constructed in the subjective well-being scale. Participants involved within this research were students of Ali Maksum Krapyak Islamic boarding school and Al-Mahalli Islamic boarding school in Yogyakarta, amounting to 100 students. Research data were analyzed with Structural Equation Modeling (SEM) through the SmartPLS 3.2.8 program. Based on the results of data analysis, the components and indicators that comprise the subjective well-being variables are declared valid and reliable. Out of the two components, the more dominant component that reflects the subjective well-being scale is affective with loading factor of 0.984. This put life satisfaction as the weaker reflecting component with a loading factor value of 0.923. These results indicate that all components and indicators are able to reflect and construct subjective well-being variables. Thus it is determined that the measurement model can be accepted as the theories that designate the subjective well-being variables are in accordance with the empirical data obtained from subjects.

Keywords - Construct Reliability, Construct Validity, Life Satisfaction, Negative Affect, Positive Affect, Subjective Well-being

I. INTRODUCTION

Adolescence is considered a crucial stage of development where a person would undergo various transformations that affect their physical, psychological, and sociological attributes (Kays, Hurley, & Taber, 2012). Adolescence is also referred to as the age of transition from childhood to adulthood in which there are needs that must be met to deal with rapid physical changes, dramatic psychological changes, and the transition in social and cultural contexts (Gelhaar et al. 2007). These changes will have an impact on the psychological well-being of adolescents. According to Diener (2000), one of the main dimensions of psychological well-being is subjective well-being. The subjective well-being of adolescents is a vital aspect in the lives of young people (Varela, Sirlopú, Melipillán, Espelage, Green, & Guzmán, 2019).

This study discusses the subjective well-being of adolescents in the context of the school context. Other studies that examines subjective well-being in the school environment include those conducted by Tian, Tian, and Huebner (2016), Tian, Wang, and Huebner (2015), Tian, Zhang, Huebner, Zheng, and Liu (2016), and Tomy, Norrish, and Cummins (2013). Subjective well-being envisioned in this study is understood as an important index in measuring mental health and the quality of life of students (Peterson, Chatters, Taylor, & Nguyen, 2014). Subjective well-being is a life evaluation consisting of high positive influence (positive emotions), low negative influence (negative emotions), and high life satisfaction (Diener, Oishi & Tay, 2018).

Subjective well-being that is often felt by a person will affect their endurance physically as happy people will tend to be healthier, less likely to catch sickness, and more able to control themselves (Diener &

Chan, 2011). This is in line with research (Blanchflower, Oswald, & Stewart-Brown, 2013; Wiest, Schuz, Webster, & Wurm, 2011) accounts the benefits generated by subjective well-being that affect physical health and psychological health. Diener, Pressman, Hunter, and Delgado-Chase (2017) say that subjective well-being is also beneficial for student learning success. It is also believed to be able to arouse enthusiasm (Pressman & Cohen, 2012) and ward off illness (Wiest, Schuz, Webster, & Wurm, 2011). Conversely, someone who feels a lot of negative emotions is more at risk of developing cancer (Russ Stamatakis, Hamer, Starr, Kivimaki, & Batty, 2012). Depressed adolescents are also more likely to be overweight, thus worsening their health (Kubzansky Gilthorpe, and Goodman, 2012).

Subjective well-being has been shown to be closely related to work welfare (Reichl, Leiter, & Spinath, 2014). Simón-Saiz, Fuentes-Chacón, Garrido-Abejar, Serrano-Parra, Larrañaga-Rubio, and Yubero-Jiménez, (2018) argue that the most tenacious adolescents will get better results in all dimensions of quality of life, one of which is being stronger in the dimensions related to mental health. The oppressions in cyberspace have a negative impact on subjective well-being (Navarro, Lee, Jiménez, & Cañamares, 2019). Correspondingly with a sample of adolescents, Navarro, Ruiz-Oliva, Larrañaga, and Yubero (2015) found that victims of cyberbullying and social bullying reported that they possess low-quality well-being. Graham, Trew, Schmidt, and Kline, (2007) say that the level of subjective well-being is related to productivity, socially desirable behavior as well as good mental and physical health. Accordingly, acclaimed literature has focused on the determinants of subjective well-being (Dolan Peasgood, & White, 2008). As reported in a study, social networks, and good relationships can support subjective well-being (McKee, Harrison, Lee 1999; Miething, Almquist, Östberg, Rostila, Edling, and Rydgren, 2016). Friendship has been shown to have a positive effect on subjective well-being because it is an important source of social support. For instance, if the presence of subjective well-being in a friendship is recognized, this will individuals adjust to new social environments (Bagwell et al., 2005; Rose et al., 2007), increase social interactions and foster one's social development in which will in turn also increase subjective well-being (Buote et al., 2007; Glick & Rose, 2011).

The conceptualization of subjective well-being was first proposed by Diener (1984) and is now widely accepted by various researchers (Liu, Mei, Tian, & Huebner, 2016; Tomy, Norrish, & Cummins, 2013). Diener (1984) introduced subjective well-being as a means of identifying the field of psychology that explores the evaluation of a person's quality of life, including cognitive assessment and affective reactions (Diener, Suh & Oishi, 1997). The term subjective well-being introduced by Diener (1984) includes a broader concept of happiness. Indicator of happiness is one component that describes the level of subjective well-being (Martin, 2012). Subjective well-being is understood as an individual's cognitive assessment by comparing their living conditions with self-determined standards (Diener, 2000). Many researchers consider that good life in terms of subjective well-being is a combination of life satisfaction, a high level of positive influence, and a low level of negative influence (Diener, 1984; Diener, 2000). Subjective well-being can be conceptualized as a combination of three aspects, namely evaluative, eudaimonic, and experiential well-being, each of which can be defined and measured (Deaton & Stone, 2016).

Subjective well-being is a positive assessment of life. Someone is said to have high subjective well-being if they experience life satisfaction and rarely experience unpleasant emotions (Diener, 2009). Subjective well-being is defined as an overall evaluation of an individual's life and individual's emotional experience, which includes broad assessments, such as life satisfaction, satisfaction in health, and feelings that reflect how individuals deal with what happens in life (Diener et al., 2017). Subjective well-being as a subjective evaluation of a person adopts concepts such as global life satisfaction, satisfaction in domains of life, high positive emotions, and low levels of negative emotions (Diener, Oishi, & Lucas, 2015). Veenhouven (2011) explains that subjective well-being is the level at which people evaluate the quality of their life as they had expected it to be and experience pleasant feelings.

Subjective well-being is a broad concept that encompasses cognitive and emotional components (Anderson, Hildreth, & Howland 2015). Subjective well-being describes well-being in terms of a series of feelings that arise from what people do and how they think and feel (Ryan & Huta, 2009). Subjective well-being refers to the holistic evaluation of an individual's life, which involves the satisfaction or influence of life (Diener & Diener, 2009). Therefore, subjective well-being is seen as a positive experience that affects subjective happiness, global life satisfaction, and life satisfaction in the context of various domains, such as school (Diener, Oishi & Tay, 2018).

Subjective well-being refers to all forms of evaluation of one's life or emotional experiences, such as satisfaction, high positive influence, and low negative influence (Diener, Oishi, & Lucas, 2015). The factors that influence subjective well-being are divided into two, namely subjective factors and objective factors (Yamaguchi & Kim, 2013). Subjective factors include self-acceptance (Bajaj, Gupta, & Pande, 2016), and gratitude (Watkins, Emmons, Greaves, & Bell, 2018); whereas objective factors include social relations (Diener, Tay, & Oishi, 2013), family support (Lin, 2016), and positive social environment (Boucher, 2020).

A study conducted by Diener (2009) in the effort to develop subjective well-being measuring tool detail the following components: 1) Life satisfaction (cognitive), is an assessment of one's life. Life satisfaction is the ability of a person to encounter their experiences accompanied by excitement or happiness. Life satisfaction will be achieved when what is envisioned of the life of a person fits with what occurs in reality. 2) The affective component describes a person's reaction to the events in their life that include emotions that are pleasant and unpleasant. Affect is divided into two kinds, namely, positive affect and negative affect. a) Positive affect manifests as pleasant mood and emotions in which one can feel energized, active, and alert. b) Negative affect is manifests as an unpleasant mood and emotions and represents a negative response from one's experience of life. The main forms of negative or unpleasant response include anger, sadness, anxiety, stress, frustration, guilt, shame, shame, envy heart, scared, and nervous.

A multidimensional conceptual framework of subjective well-being consisting of life satisfaction and affective can be seen in Figure 1.

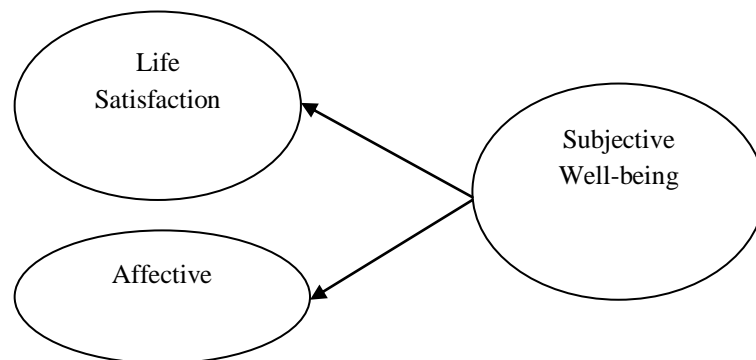


Fig 1. Conceptual Framework of Subjective Well-being Components

Based on Figure 1 above, this study hypothesizes that life satisfaction and affective components are able to simultaneously form the construct of subjective well-being.

An approach that can be used in testing the construction of a measuring tool is the Confirmatory Factor Analysis (CFA). This test is used to examine a measurement model so that it may be resolved as able to properly describe the components and indicators of behavior in reflecting the latent variable of subjective well-being. Confirmatory Factor Analysis (CFA) is also used to test the construct validity and construct reliability of the indicators (items) forming a latent construct (Ghozali & Latan, 2012). Confirmatory Factor Analysis (CFA) used is a second-order Confirmatory Factor Analysis (2nd Order CFA), a measurement model that consists of two levels. The first level of analysis is carried out from the components to the indicators and the second is the analysis from the latent variable to the components (Latan, 2012).

Based on the accounts explained above, subjective well-being is an important psychological attribute for students, both in the setting of a boarding school environment and the wider social environment. Considering the importance of subjective well-being, this study aims to test the construct validity and reliability of the subjective well-being scale and examine the components and indicators that make up subjective well-being.

II. RESEARCH METHOD

2.1. Research Participants

The research participants were Ali Maksum Krapyak Islamic boarding school students and Al-Mahalli Islamic boarding school students in Yogyakarta. Participants in this study amounted to 100 students, both male and female, and aged between 12-15 years.

2.2. Research Instruments

The instrument used to measure subjective well-being in this study is the subjective well-being scale, which was developed based on two subjective well-being components from Diener (2009), namely cognitive (life satisfaction) and affective (positive affect and negative affect).

This scale was developed by researchers in the form of a Likert scale as an instrument for obtaining empirical data from subjective well-being, with a total of 40 items, each component consisting of 20 items. An assessment of this scale is 1-4, where the greater the number is chosen indicates the higher level of subjective well-being. Vice versa, the smaller the number chosen will indicate the lower level of subjective well-being.

Examples of statements from the cognitive component (life satisfaction) and the affective component can be seen in Table 1 below:

Table 1. Example of subjective well-being variable items

Component	Item Examples
Cognitive (Life Satisfaction)	“I can focus when studying” “I have enough rest time” “I’m satisfied with my life”
Affective a. Positive Affect	a. Positive Affect “Proud” “Happy” “Amazed/Fascinated”
b. Negative Affect	b. Negative Affect “Nervous” “Unsettled/Uneasy” “Worried”

The blueprint that is used as a reference in constructing the subjective well-being scale can be seen in Table 2 below.

Table 2. Subjective well-being scale blueprint

No	Component	No Item		Σ Item
		Favorable	Unfavorable	
1	Life Satisfaction	1,2,3,4,5,6,7,8,9,10, 11,12,13,14,15,16, 17,18,19,20		20
2	Affective a. Positive Affect b. Negative Affect	21, 22,23,24,25, 26,27,28,29,30	31,32,33,34,35, 36,37,38,39,40	20
	Amount			40

2.3. Construct Validity and Construct Reliability

The construct validity test consists of the convergent validity test and the discriminant validity test. Convergent validity can be determined through the loading factor value of > 0.5 and the Average Variance Extracted (AVE) value of > 0.5 (Jogiyanto, 2011). Whereas, discriminant validity can be concluded from comparing the roots of the Average Variance Extracted (AVE) where the value between forms must be higher than the correlation among them (Jogiyanto, 2011).

The construct reliability test is done by looking at the value of composite reliability and Cronbach alpha. According to Hair, Black, Babin, and Anderson (2014), the expected composite reliability and Cronbach alpha values of > 0.7 and 0.6 can be accepted (Jogiyanto, 2011).

2.4. Data Analysis

The data in this study were analyzed using the Smart PLS 3.2.8 program with reflective constructs through the 2nd Order CFA. Partial Least Square (PLS) is a variant-based Structural Equation Model (SEM) that can simultaneously test measurement models for their construct validity and reliability.

III. RESULT

The results of the analysis of the outer model test on the subjective well-being scale conducted using the Smart PLS 3.2.8 program can be seen in Figure 2 below.

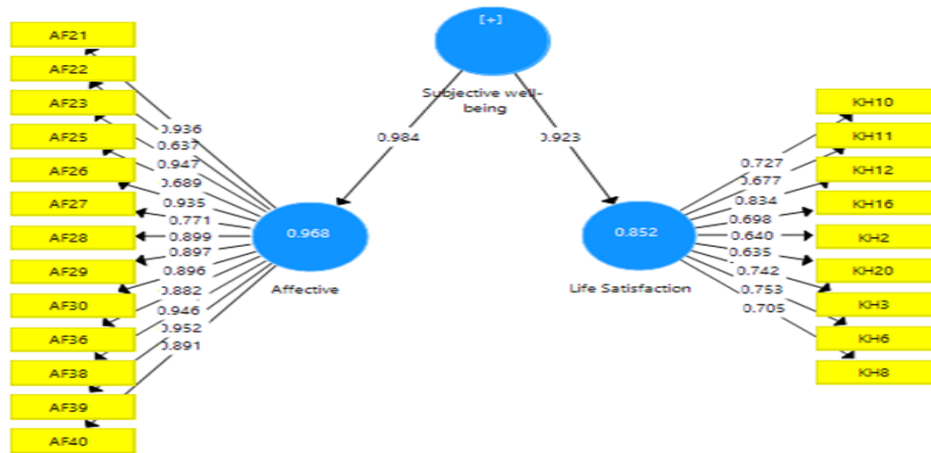


Fig 2. Outer Model Test Output for Subjective Well-being Scale

3.1. Results of Construct Validity Test

3.1.1. Convergent Validity

Convergent validity test results were obtained by testing the outer model established from the loading factor value and Average Variance Extracted (AVE). The test was done by looking at the loading factor value of > 0.5 and Average Variance Extracted (AVE) of > 0.5. Based on the data from the analysis conducted, it was found that the value of the loading factor from variables to components and from components to indicators amounts to > 0.5. Loading factors with a value of 0.5 or more are considered to have strong enough validity in representing latent constructs (Hair, Black, Babin, & Anderson, 2014). The results of convergent validity testing can be seen in Table 3 and Table 4.

Table 3. Loading factor (Variable-component)

Component	Value of Loading Factor	Information
Life Satisfaction	0.923	Valid
Affective	0.984	Valid

Table 4. Loading factor (Component-indicator)

Item	Value of Loading Factor	Information
KH10	0.727	Valid
KH11	0.677	Valid
KH12	0.834	Valid
KH16	0.698	Valid
KH2	0.640	Valid
KH20	0.635	Valid
KH3	0.742	Valid
KH6	0.753	Valid
KH8	0.705	Valid
AF21	0.936	Valid
AF22	0.637	Valid
AF23	0.947	Valid
AF25	0.689	Valid
AF26	0.935	Valid
AF27	0.771	Valid
AF28	0.899	Valid
AF29	0.897	Valid
AF30	0.896	Valid
AF36	0.882	Valid
AF38	0.946	Valid
AF39	0.952	Valid
AF40	0.891	Valid

Based on the convergent validity test, the Average Variance Extracted (AVE) in the subjective well-being construct show a value of 0.614 in which can extensively be seen in Table 5.

Table 5. Values of Average Variance Extracted (AVE) of subjective well-being construct

Component	Value of Average Variance Extracted (AVE)	Information
Life Satisfaction	0.511	Valid
Affective	0.763	Valid

3.1.2. Discriminante Validity

Based on the discriminant validity test value, the obtained root value of the Average Variance Extracted (AVE) in each component is higher than the Average Variance Extracted root (AVE) in other components, thus the discriminant validity criteria are met. Average Variance Extracted Root Value (AVE) of the subjective well-being construct can be seen in Table 6.

Table 6. Root Value of Average Variance Extracted (AVE) of subjective well-being construct

	Affective	Life Satisfaction
Affective	0.873	0.839
Life Satisfaction	0.839	0.715

The construct validity in SEM (Confirmatory Factor Analysis/CFA) shows that both components are valid with a loading factor value of > 0.5 .

3.1.3. Construct Reliability Test

Construct reliability testing was done by testing the outer model comprehended from the composite reliability and Cronbach alpha values. This test was done by looking at the value of composite reliability and Cronbach alpha with values of > 0.7 , indicating that the scale in this study is reliable. The composite reliability and Cronbach alpha values can be seen in Table 7.

Table 7. Values of composite reliability and Cronbach alpha subjective well-being

Variable	Composite Reliability	Cronbach's Alpha	Information
Subjective Well-being	0.971	0.968	Reliable

Based on the results of the construct reliability test shown in Table 6, it is shown that the subjective well-being scale has good reliability, meaning that the components that appraise subjective well-being variables meet unidimensional criteria (Hair, Hult, Ringle & Sarstedt, 2014). This is indicated by the values of composite reliability of 0.971 and Cronbach Alpha of 0.968. The construct validity and reliability tests produce valid and reliable items that are able to reflect the subjective well-being components, namely the items in numbers 10, 11, 12, 16, 2, 20, 3, 6, 8, 21, 22, 23, 25, 26, 27, 28, 29, 30, 36, 38, 39 and 40. Based on the analysis of research data using outer model testing, the measurement model can be deemed as acceptable since all components of subjective well-being are able to reflect the subjective well-being variables.

IV. DISCUSSION

Based on the analysis of construct validity and construct reliability, the components and indicators that make up the construct of subjective well-being are declared valid and reliable. Thus, all existing components and indicators are able to reflect and form subjective well-being constructs. The more dominant component that is able to reflect subjective well-being is affectivity with a loading factor of 0.984. Affectivity describes how a student feels positive emotions more often than negative emotions. This is supported by valid and reliable indicators that show that students feel amazed, happy, proud, strong, steadfast, and alert. In addition, students also receive a lot of attention and inspiration from the environment of the boarding school, although sometimes they feel nervous, anxious, and worried about being in the boarding school.

The weaker component that reflects subjective well-being is life satisfaction, with a loading factor of 0.923. Life satisfaction describes how individuals feel satisfied with their lives. Valid and reliable indicators show that students feel that their living conditions are good. The students enter the boarding school with their own motivations and support from their parents, enabling them to establish good relations with the caregivers and enjoy life in the boarding school and, in turn, help them relax while studying class so that they feel satisfied with the life they lead.

A previous study that examined the constructs of subjective well-being relevant to this study, which also explore validity and reliability, was proposed by Zheng, Sun, Huang, and Zou (2019). The research entails an investigation using the subjective well-being scale through a questionnaire for 68 medical students (30 male and 38 female) aged 18 to 22 years. In the study, the scale used to measure subjective well-being is the SHS scale from Lyubomirsky and Lepper 1999, the study fulfilled the reliability requirements with Cronbach Alpha of 0.90. Triwidyati, and Tentama Research (2020) conducted a study with Cronbach Alpha value of 0.841 from 69 junior high school subjects. Wen, Geng, and Ye (2016) in their research adopted instruments developed by Diener, Emmons, Larsen, and Griffin (1985), the study showed that the scale had met the reliability requirements with Cronbach alpha of 0.820.

Another study that demonstrates the framework of subjective well-being instruments from Diener, Emmons, Larsen, and Griffin (1985) used as a reference (Gerson, Plagnol, & Corr, 2016) shows that the scale meets the reliability requirements with Cronbach Alpha of 0.93. Subjective well-being instruments in the research of Balzarotti, Biassoni, Villani, Prunas, and Velotti, (2014) were also measured by the Positive and Negative Affect Schedule (PANAS) scale (Watson, Clark, and Carey, 1988) in which it is composed of 10 items that containing ten other items. PANAS has been translated into several languages, including Italian (Terraciano, McCrae, & Costa, 2003), showing strong psychometric properties. The study showed that the scale had met the reliability requirements obtaining Cronbach Alpha coefficient of 0.80 with subjects in this study consisting of 470 Italian-speaking adults.

Research of Saputra and Tentama, (2020) surrounding the subjective well-being scale obtained a reliability outcome with a Cronbach Alpha coefficient of 0.679 with a subject of 60 online motorcycle taxi drivers. Research by Hu, Cui, and Wang, (2016) on the subjective well-being scale obtained results of reliability with a Cronbach Alpha coefficient of 0.837, confirming that this scale has met the reliability requirements. The subjects in the study were school principals who attended training courses in Chongqing, China in the sum of 254 subjects (207 are male and 47 female). Correspondingly, Ma, Zhang, Ding, and Wang (2018) conducted an examination using the subjective well-being scale, showing that the scale had met the reliability requirements with Cronbach Alpha of 0.804, with participants in this study numbering 908 subjects.

The studies above, when compared with the results of this study shows that the subjective well-being scale results obtained in this study are appropriate to be used or applied in expressing subjective well-being in students. The results of the analysis show that the scale of subjective well-being has comparably higher validity and reliability, with a composite reliability of 0.971 and Cronbach alpha 0.968. The results of this study are expected to provide a picture of the validity and reliability of the subjective well-being scale, especially in revealing subjective well-being in students, so that it can be of a reference in further research related to subjective well-being.

V. CONCLUSION

Based on the analysis and discussion that has been done, it can be concluded that: 1) The subjective well-being construct possesses good validity and reliability, and 2) All components and indicators can assemble subjective well-being. The more dominant component reflecting subjective well-being is affectivity, and the weaker component reflecting subjective well-being is life satisfaction. In this study, a subjective well-being scale measurement model was formed in accordance with empirical data obtained from subjects at the study sites.

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