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PSYCOMETRIC PROPERTIES OF THE AUTHENTIC HAPPINESS SCALE (AHS) INDONESIAN VERSION WITH CONFIRMATORY FACTOR ANALYSIS AND RASCH MODEL

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ABSTRAK

Penelitian ini bertujuan untuk mengkaji sifat psikometrik skala kebahagiaan otentik (AHS) versi Indonesia, yang meliputi analisis unidimensionality dan item fit menggunakan CFA dan Rasch Model. Validitas dan reliabilitas. Skala ini terdiri dari kebahagiaan yang otentik dan berfluktuasi yang terdiri dari 20 item, masing-masing sepuluh item. Skala tersebut diberikan kepada 112 orang pendidik sebagai sampel yang diambil secara purposive sampling. Pada uji unidimensionalitas CFA, sepuluh item dieliminasi untuk mendapatkan model yang fit, dan sepuluh item diuji ulang dan dianalisis menggunakan model Rasch. Hasil analisis di atas membuktikan bahwa AHS memiliki sifat psikometrik yang baik untuk digunakan dalam versi bahasa Indonesia.
Kata Kunci: Happiness, Authentic happiness scale, CFA, Rasch Model

ABSTRACT

This study aims to examine the psychometric properties of the Indonesian version of the authentic happiness scale (AHS), which includes an analysis of unidimensionality and item fit using the CFA and Rasch Model. Validity and reliability. This scale consists of authentic and fluctuating happiness consisting of 20 items, ten items each. The scale was administered to 112 educators as samples taken by purposive sampling. In the CFA unidimensionality test, ten items were eliminated to obtain a fit model, and ten items were re-examined and analyzed using the Rasch model. The above analysis results prove that AHS has good psychometric properties to be used in the Indonesian version
Keywords*: Happiness, Authentic happiness scale, CFA, Rasch Model*

INTRODUCTION

Happiness has long been thought of by philosophers such as Aristotle as an ultimate goal in life (Sato et al., 2015). There is no denying that happiness at the individual and community level is essential. However, psychology as a scientific science is considered unbalanced in researching the behavior, including human emotions. Shepherd et al. (2014) assessed that most psychological research only focuses on mental illness rather than mental health. From this, positive psychology emerged, a new era of psychology interested in positive emotions and the effects of positive emotions on mental well-being (Seligman et al., 2005). Several studies related to happiness have also been carried out, a few of them; the relationship between religion and happiness (Francis et al., 2003), quality of life and

happiness (Susniene & Jurkauskas, 2009), a measure of happiness (Lyubomirsky & Lepper, 1999), happiness as a component of job satisfaction (Weaver, 1978), happiness and depression (Rezaee, 2016), happiness and social functioning (Veenhoven, 1994), happiness and academic achievement (Otaghi et al., 2020).

Seligman (2002) tries to define happiness by another concept, namely, authentic happiness, to fill a significant gap in definitions in the literature. Authenticity is defined as being honest and realistic in expressing oneself sincerely (Peterson et al., 2006). The concept of authentic happiness is defined as a mood that is consistent, spiritual, stable, harmonious, and responsible (Seligman, 2002).

Individuals inclined towards authentic happiness are unlikely to give up when faced with obstacles and challenges. Instead, individuals look for meaning and sources of happiness in their suffering. Individuals prefer to face what is experienced rather than reject or suppress it. Therefore, individuals with authentic happiness will be bold and self-aware to ensure that they remain consistent in their moods (Sanli et al., 2019).

Apart from authentic happiness, which is considered happiness that lasts long in the individual, there is also fluctuating happiness. A person will not be judged only from authentic but also fluctuating happiness. For example, how close are individuals to authentic happiness, and to what extent are individuals to happiness fluctuating (Sanli et al., 2019)? Dambrun & Ricard (2011) explain that fluctuating happiness results from actions that try to maximize pleasure and avoid displeasure through a self-centered function perspective in which the phases of pleasure and displeasure alternate repeatedly.

Research related to authentic and fluctuating happiness was simultaneously carried out by Sanli et al. (2019) with the Authentic Happiness Scale (AHS) instrument conducted in Turkey. As is known, Turkey has a culture that is not entirely eastern. Turkey is located in the Eurasian region, stretching from the Anatolian Peninsula in Southwest Asia to the Balkans in Southeastern Europe. As a result, Turkey has two cultures between the West and the East (Veenhoven, 1994); it says happiness is one of the most critical goals in living individually or in society in Western culture.

Meanwhile, Indonesia, with an area of 1.9 million km2 and a population of 270.20 million (Indonesian Central Statistics Agency, 2020), is one of the states in Asia which is entirely in the Southeast Asian region and has an eastern culture. Indonesia, one of the countries with the largest population globally, puts forward a collectivistic culture rather than an individualistic society that characterizes Southeast Asian society. Then, Indonesia, which is considered one of the religious countries in the world, rejects wealth as a source of happiness (Nadir, 2016). Happiness can be obtained from thinking and admitting that it can be obtained under any condition (Falah, 2021). However, there are limitations in finding measurements related to aspects of happiness in Indonesia, where happiness is a latent construct.

Confirmatory Factor Analysis

Factor Analysis is an analytical method to find one or more latent variables that cause why a set of variables are correlated with each other. Exploratory Factor Analysis is not considered a statistical model because it does not have a hypothesis or significant test. Then, in the 1960s period, Lawley & Maxwell (1962) and Joreskog (1969) proposed a regression model in which: (1) observed variables were used as dependent variables, the

value of which depends on (influenced by) the high and low latent value. Variables (factors) that are used as independent variables, and (2) the parameters (regression coefficient, correlation between factors, and residual variance/covariance) were estimated using the maximum likelihood method (Umar & Nisa, 2020). The Confirmatory Factor Analysis model was developed, which was agreed upon as a statistical model because it contained a hypothesis test and a significant test.

Rasch Model

George Rasch first developed the Rasch model to analyze dichotomous data (Rasch, 1960). Not only does it discuss traditional psychometric criteria, but the Rasch model also diagnoses the quality of the data structure and analyzes the interactions of individuals and items separately, making it one of the popular methods (Andrich, 2011). The Rasch model is a logistic model, a latent trait model for a probability as a function that increases monotonically with the formula:

$$P(x_j = 1|\theta, \delta_j) = \frac{e^{(\theta - \delta_j)}}{1 - e^{(\theta - \delta_j)}}$$

Unlike statistical models developed based on data, the Rasch model is a Rasch measurement model in which the data follow the model (Royal et al., 2010). The Rasch model is flexible for polytomy data, known as the Rating Scale Model (Andrich, 1978). AHS has a categorical response format (Likert) for all items and is suitable for analysis with RSM. The application of RSM includes the ability of people, item locations, and thresholds of each category as parameters in the logit scale (Andrich & Marais, 2019). RSM follows:

$$\log(P_{nik}/P_{ni\,(k-1)}) = B_n + D_i + F_k$$

$P_{ni\,(k-1)}$ was the threshold value is k—*1* (number of categorical responses minus one), and individual location with the ability can be interpreted as a trait level as B_n and the item as "difficulty" as D_i (Andrich, 1978), then F_k *was* the probability of k category being selected depends on k-1 category.

This study aims to evaluate the psychometric properties of the Indonesian version of the Authentic Happiness Scale (AHS), based on the Confirmatory Factor Analysis and Rasch polytomous measurement models. We tested the AHS items, which consist of 2 dimensions (authentic and fluctuating), to assess the happiness of educators in Indonesia, namely in terms of rating scale dimensions, item fit, response category function, reliability, and item differential function (DIF). The Indonesian version needs to be done to illustrate the possibility of diversity in capturing the meaning of happiness itself. Furthermore, we believe a well-adapted and validated Indonesian version of this scale will be helpful for future research on happiness in the Indonesian context.

METHOD

The Authentic Happiness Scale (AHS) (Sanli et al., 2019) was translated into Indonesian and adapted to examine the latent variables of authentic happiness and fluctuating happiness. AHS consists of 16 items, seven items measuring authentic factors

and nine items measuring fluctuating factors. To avoid dropping the items to be tested, the researcher added four items, three items for authentic factors and 1 item for fluctuating factors. The correlation between these items is assumed to occur due to authentic and fluctuating happiness factors. If these factors are held constant, then the items will not correlate with each other. AHS items are scored on a 4-point Likert scale, ranging from strongly disagree (1) to strongly agree (4). In this study, we followed the adaptation guidelines of Gudmundsson, (2009):

1. Linguists will translate AHS at the Ummul Quro Al Islami Institute, Indonesia.
2. The translator translates back into English to identify any difference in meaning between the results and the original content.
3. We consulted the results with the psychometric lecturer to see the content of the scale.

Sample

The sample in this study consisted of 112 educators from the Ummul Quro Al Islami Foundation, Bogor, Indonesia. Fifty-seven men (50.9%) and 55 women (49.1%). The mean age of the sample was 27.82 (SD=6.44). Sampling using purposive non-probability. The participation of educators is voluntary, and the distribution of the questionnaire form has received permission from the foundation to meet standard procedures.

Statistical Analysis

We hypothesize that a factor model fits the data, and the items measure only one factor, namely authentic and fluctuating happiness. The fit of the model is assessed by four indices, namely the Comparative Fit Index (CFI) and the Tucker–Lewis Index (TLI), where a descriptive index value > 0.90 indicates an acceptable model fit and a value > 0.95 indicates a good model fit. Then, with the standardized root mean square residual (SRMR) and root-mean-square error of approximation (RMSEA), the value of the model fit index < 0.08 indicates an acceptable model fit, and the value < 0.05 reflects a good model fit (Wang & Wang, 2020). After that, we will look at the significant items of the model marked by the T-test. For example, if the item coefficient is above 1.96, then the item is a significant measure of happiness.

Next, we analyzed the items using the Rasch model using the infit and outfit mean-squares (MNSQ). The expected value for each item is 1.0 or with an acceptance range of 0.5 to 1.5 as a fit item. Meanwhile, those outside this range are considered items that do not match the Rasch model (Linacre, 2021). Observations were made on the point-measure correlation value (PT-measure) to see the compatibility between the model and the data. A negative value indicates that the item is not functioning correctly (Suryadi et al., 2021). For analysis with Rasch using the Joint Maximum Likelihood (JMLE) estimator and the Winsteps application. On the other hand, CFA analysis uses the WLSMV estimator with Mplus 8 software.

RESULT AND DISCUSSION

After these items were analyzed by confirmatory factor analysis, there were ten items that we did not include because the residuals between items were correlated with each other. In other words, other factors are actually measured by these items that make them

biased items, including item 1, item 2, item 4, item 8, item 9, item 12, item 13, item 14, item 15, and item 16. These items make the model unfit. Then, the remaining items are retested and produce a fit model or measure the factor to be measured for Item 5, item 6, item 17, item 18, and item 19 to measure authentic happiness (Figure 1) and item 3, item 7, item 10, item 11, and item 20 measure fluctuating happiness (Figure 2).

The CFA model for authentic happiness has a Chi-Square of 5.556, df=5 (p-value 0.351), RMSEA 0.032, CFI 0.999, and TLI 0.998. With the p-value of Chi-Square, which is insignificant, and the RMSEA is below 0.05, the model is obtained as a fit model. Meanwhile, the CFA model for fluctuating happiness has a Chi-Square of 5.804, df=5 (p-value 0.325), RMSEA 0.038, CFI 0.997, and TLI 0.994. Just like authentic happiness, the fluctuating happiness model has a fit model.

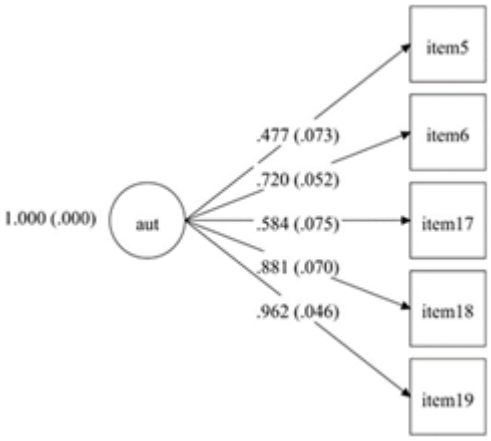

Figure 2. Authentic CFA Model

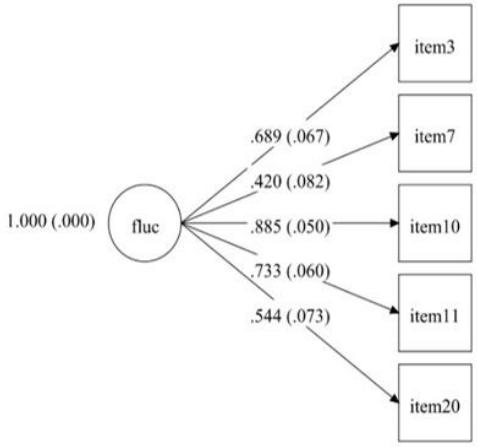

Figure 2. Fluctuative CFA Model

Table 1. Authentic Factor Loading

Item	Estimate	S.E.	Est./S.E.	P value
Item5	1.000	0.000	999.000	999.000
Item6	1.510	0.262	5.764	0.000
Item17	1.225	0.236	5.194	0.000
Item18	1.846	0.343	5.381	0.000
Item19	2.016	0.303	6.658	0.000

Table 2. Fluctuative Factor Loading

Item	Estimate	S.E.	Est./S.E.	P value
Item3	1.000	0.000	999.000	999.000
Item7	0.610	0.137	4.446	0.000
Item10	1.284	0.140	9.195	0.000
Item11	1.064	0.130	8.186	0.000
Item20	0.789	0.108	7.282	0.000

Tables 1 and 2 describe the factor loads between items to factors. For example, item 5 and item 3 in the CFA model are used as a measuring scale for each factor. The ratio between the estimate and the standard error (Est/S.E) is a T or Z value, with a critical value of 1.96. The factor load below 1.96 is considered insignificant. From the table above, the factor load of all items is above 1.96, which indicates that these items have a significant contribution to measuring authentic and fluctuating happiness.

After getting a fit and significant model or testing its unidimensionality, it becomes a requirement for Rasch analysis. This finding is supported by Rasch's PCAR, which shows 63% of the variance of the contribution to observations which is interpreted as sufficient to describe unidimensionality, where items have 55.2% variance. There is an unexplained variance in the first contrast of 13.7%. The next step is to analyze these items using the Rasch polytomy model.

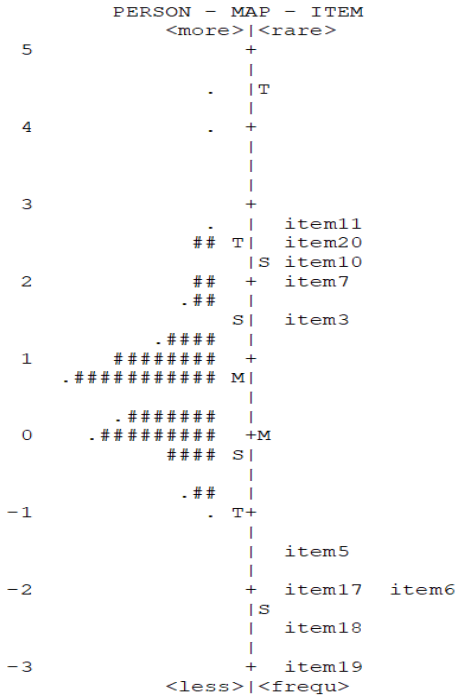

Figure 3. Wright Map

Tabel 3. Item Fit Measure

Item	Measure	Infit	Outfit	PT Measure
11. Hidup saya penuh dengan penyesalan	2.73	1.26	1.26	0.37
20. Saya tidak mengerti bagaimana kebahagiaan bisa saya dapatkan	2.41	0.94	0.95	0.41
10. Saya merasa kebahagiaan saya palsu bahkan ketika berada di antara teman-teman saya	2.33	0.85	0.85	0.62
7. Tidak ada yang membuatku bahagia dengan mudah	1.9	0.96	0.98	0.39
3. Saya merasa bertindak berbeda dari yang saya inginkan, hanya untuk terlihat bahagia di mata orang lain	1.45	1.03	1.03	0.61
5. Orang-orang di sekitarku membuatku bahagia	-1.55	1.04	1.03	0.25
6. Ada kondisi tertentu yang membuat perasaan saya tersakiti, tetapi mereka (teman atau keluarga) telah membantu saya tumbuh sebagai pribadi	-1.92	0.95	0.95	0.39
17. Menjadi bahagia adalah tujuan hidup saya	-1.96	0.81	0.8	0.44
18. Bahagia bisa saya dapatkan dari hal hal kecil	-2.44	0.92	0.93	0.31
19. Saya menyadari jika teman dan keluarga merupakan bagian kebahagian hidup saya	-2.94	1.1	1.07	0.33

From the distribution map or Wright map, it can be seen that the items have a range of difficulty levels above individual abilities. For example, the most difficult item to approve was item 11. “My life is full of regrets”, and the easiest item to agree was item 19, “I realize that friends and family are a part of the joy of my life”.

However, there is a gap between item 3 and item 5 in the distribution map where additional items are needed to fill the gap. Additional items are used to adjust the size of the many individuals in the gap.

Then, table 3 shows the item size and fit statistics, where all items on the authentic and fluctuating AHS scale have an acceptable range of outfits (0.5 – 1.5). From this description, it can be interpreted that these items are following the Rasch Politomy Model (RSM). For example, item 19, with the lowest value of -2.94, is considered an item that tends to be easily accepted to be answered "strongly agree" by the respondent. Meanwhile, item 11 is the least likely item to be answered in agreement with the logit location of 2.41. In this study, the PT-measure (PT-M) on the Indonesian version of the AHS instrument showed a positive correlation ranging from 0.25 to 0.62, which was interpreted as the items functioned well and as expected (positive).

The mean of the person measure is 0.70 [standard deviation (SD) = 0.89] which is compared to the item mean = 0. This finding indicates that the happiness of educators tends to be higher than the attitude measured in the AHS.

CONCLUSION

This study has provided new literature in research on happiness with the AHS scale, previously conducted by Sanli et al. (2019). By using the Rasch model, it can be seen which items tend to be challenging to answer and easy to answer. In addition, the AHS scale has a suitable model in the Indonesian version.

Unidimensionality on the AHS scale has also been tested following the requirements for conducting the Rasch model. The items were tested by confirmatory factor analysis to see the structure of the items and their factor loads after being analyzed as a fit model. In addition, items measuring fluctuating happiness are separate from authentic happiness, and items on fluctuating happiness tend to be challenging to answer strongly agree or agree.

By testing the unidimensionality of the CFA and the Rasch Model as popular and reliable statistical methods, the Indonesian version of AHS can be used for educators, although with certain limitations. However, sample coverage is a problem because a larger sample will have better statistical power.

Furthermore, the sample only comes from specific cities in Indonesia where cultural differences in certain regions are not considered. Therefore, our findings can at least be a way to expand the study area in terms of sample diversity in Indonesia. Finally, nonprobability sampling techniques may not accurately represent the population in this study. As a result, the importance of limitations is informed for conducting replicated studies in different populations for methodological improvements concerning the AHS scale.

The Indonesian version of the AHS scale test is the first study with psychometric properties and analyzes it using Rasch analysis. This study shows that the Indonesian

translation of the AHS scale represents a psychometric instrument for assessing the authentic and fluctuating happiness of educators in Indonesia and follows the unidimensional happiness model, based on the Rasch model of measurement standards. Besides considering the problem of sample diversity, the next researcher begins to examine the problem of the size of the AHS scale invariance, which various groups can later use. Then, try to analyze the multidimensional items to get conclusions from the items that measure things other than happiness.

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