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Development and Psychometric Properties of the Relational Mobility Scale for the Indonesian Population

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***Abstract*—**This study aims to develop the Relational Mobility Scale for the Indonesian population and to investigate its psychometric properties. New items of the scale were created taking into account the Indonesian population which consists of two parallel forms (A and A'). This study uses 30 newly orchestrated items while keeping in mind the characteristics of the targeted population. The scale was administered to 433 public high school students in Malang, Indonesia. Construct validity of its factor structure was demonstrated using exploratory factor analysis and confirmatory factor analysis. The result exhibits that he model fits the data, and that the delayed alternate form method shows acceptable result. Results yielded that 21 items of the three-dimensional Relational Mobility Scale is suitable for measuring relational mobility in high school students of Indonesian population.

***Keywords*—**Confirmatory factor analysis, exploratory factor analysis, delayed alternate form, Indonesian population, relational mobility scale.

I. Introduction

RELATIONAL mobility is often used to describe a social structure that is comprised of people with extraordinary opportunities to choose and reform a new relationship, and people in a different society who are more attached to their social order and exhibit the least interest in availing opportunities to create new relations. Relational mobility is defined as the number of opportunities available to people using which new relationships can be established in a society [12]. People with a high relational mobility will opt for opportunities which result in pleasure and satisfying relations, and termination of unsatisfying relationships. On the other hand, people with low relational mobility will forgo the opportunities leading to establishment of new relations with new people, because there exists interdependency relationality [4], [11].

Relational mobility construct started to withdraw more attention in psychological research area, it started from research conducted by Yamagishi and Yamagishi [10] regarding assurance and generalized trust in Japanese and American society. Nevertheless, a variety of studies have been conducted which relate relational mobility with various variables such as tendencies of self-disclosure [7], interpersonal similarity [8], and social rejection [6]. Furthermore, it relates to Yamagishi's research which proposed a concept of relational mobility, [12] developed 12 items for relational mobility with a 6-point Likert scale which entails three dimensions: 1) number of generally available opportunities to meet new interaction partners in society, 2) opportunities for people to select their own relationships and groups, and 3) the tendency for individuals to be bound to current relationships or groups. The result of Yuki's [12] first study, which used a principal components factor analysis, directed that the items are dependent on three factors. In the second study, the 12 revised items were used and the result of a principle components factor analysis showed that two factors are applicable. These factors are: Meeting new people, and choosing one's own interaction partners.

In contrast to Yuki's study [12], current study emphasizes on new relational mobility scale and for this purpose its parallel forms were developed. Each form comprises 30 newly orchestrated items while keeping in mind the characteristics of the Indonesian population. The reason to select this population is that Indonesia is a country consisting many islands with multiple cultures, and Indonesians often move from island to island for work, business, education, or/and marriage reasons. It means that there is the potential of possible movements between relationships and groups in Indonesian society, particularly in a big city society.

The development of the relational mobility scale for Indonesian populations can contribute to the knowledge concerning psychological testing, psychological measurement by developing the scale and investigating its psychometric properties. Furthermore, as a result, this study will provide a tool for research in psychology such as social psychology research that concerns relational mobility.

In assessing psychometric properties, exploratory factor analysis and confirmatory factor analysis were used to investigate the factor structure and the model fit based on the construct proposed by [12]. Delayed alternate form approach is also used to investigate the consistency over time and over alternate forms.

II. Procedure

A. Method

In this study, some approaches were employed. First Exploratory Factor Analysis (EFA) and then Confirmatory Factor analysis (CFA), these techniques enabled the investigation of model fit. Along with EFA and CFA, in order to examine the reliability, the Cronbach's alpha and delayed

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alternate form were also performed.

Related to delayed alternate form technique, two parallel forms of relational mobility scale were developed. First form named *Form A*, and second form named *Form A'* were administered, respectively, with two weeks interval.

B. Participants

433 high school students were recruited from high school (SMAN 5 Malang) in grade 10 and 11, who volunteered twice in the data collection process. The time interval induced between Time 1 (Form A) and Time 2 (Form A') is two weeks. The 433 dataset was used to analyze EFA, and delayed alternate form reliability. The second dataset contained 300 samples of the same population. The second dataset was used to analyze CFA. Overall, the dataset contained 479 females (65.44%), and 253 males (34.56%).

III. Results

A. Exploratory Factor Analysis

Adequacy of the sample size was calculated as a preliminary analysis before performing the EFA. The 433 sample size was an adequate sample size, indicated by the overall KMO value = 0.83, and the KMO value for each item ranged from 0.648 to 0.900. These results of KMO test exhibited that the sample size and the data are adequate for the further analysis.

The EFA was executed using Promax rotation method. The variance accounted for by the factor (eigenvalue), was used to identify the number of factors. The eigenvalue greater than 1.0 was used as an indication of number of factors to retain. Further reduction of items was performed because of the presence of low factor loadings (< 0.30), or items containing both low factor loadings (< 0.30) and high cross loadings (> 0.30). Therefore, there are nine items of *Form A* were discarded in order to ensure accuracy.

After eliminating items, EFA was re-analyzed, and total of 21 items remained in the relational mobility scale, and producing three correlated dimensions, with 10 items extracted for the general amount of opportunities to meet new interaction partners in the society. Six items extracted for opportunities for people to select their own relationships and groups. Five items extracted for the tendency for individuals to be bound to current relationships or groups. The detailed results of the EFA are presented in Table I.

The fit index, *the root mean square of the residuals* (RMSR) of the 21-item model was 0.05 which indicates a reasonable fit [2]. *The df corrected root mean square of the residuals*, and *Fit based upon off diagonal values* exhibit satisfying fit that are 0.06 and 0.94, respectively.

As presented in Table II, correlations between factors are relatively moderate. It indicates that dimensionality of relational mobility construct is multidimensional with correlated dimensions. The highest correlation value is 0.44 which represents the correlation between the first dimension and the second dimension.

TABLE I
FACTOR STRUCTURE OF RELATIONAL MOBILITY SCALE (FORM A)

Item	**Factor 1**: Opportunity to meet new people	**Factor 2**: Opportunity to select relationship	**Factor 3**: Hesitation to be bound to the existing relationships
1	0.546		
2	0.486		
3	0.616		
4	0.565		
5	0.417		
6	0.581		
7	0.619		
8	0.608		
9	0.673		
10	0.370		
11		0.769	
12		0.840	
13		0.437	
16		0.722	
17		0.640	
20		0.365	
21			0.684
22			0.770
23			0.304
25			0.619
30			0.665
Eigenvalue	4.948	2.530	2.090
% of variance	40	33	27

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B. Confirmatory Factor Analysis

After carrying out EFA, CFA was conducted in order to confirm the result of EFA. As it is demonstrated in Fig. 1, the model tested was three correlated dimensions model. In order to improve the model fit, model was modified by correlating the errors of item 4, item 5 and item 6.

While using Lavaan package through R program, the fit test showed acceptable model fit, indicated by the Comparative fit indices (CFI) = 0.922 and Tucker–Lewis index (TLI) = 0.911. The CFI value ranging from 0 to 1, with values closer to one, indicates better model fit. CFI represents how much of the variance in the covariance matrix has been accounted for by the model. Similar to the CFI, the Tucker–Lewis index (TLI) closer to 1 indicates good model fit [1], [9].

Table III displayed estimated parameter value, standard error, and Wald test for each model parameter. The Wald test was indicated by Z-value, which provides information about whether the existing estimated parameters should be removed. Z values of ±1.96 (α=.05) or larger are statistically significant [1], and hence parameter estimates should not be eliminated. As can be seen in Table III, all values of Z exceeded ±1.96 and $\alpha < 0.05$. These fit indices were corroborated by the value of Root Mean Square Error Of Approximation (RMSEA) = 0.049 and the standardized root mean square residual (SRMR) = 0.059. Both SRMR and RMSEA can take an assortment of values from 0 to 1, which 0 indicates a perfect fit. In this study, the values of RMSEA and SRMR were very close to 0, these results suggest good model fit [1].

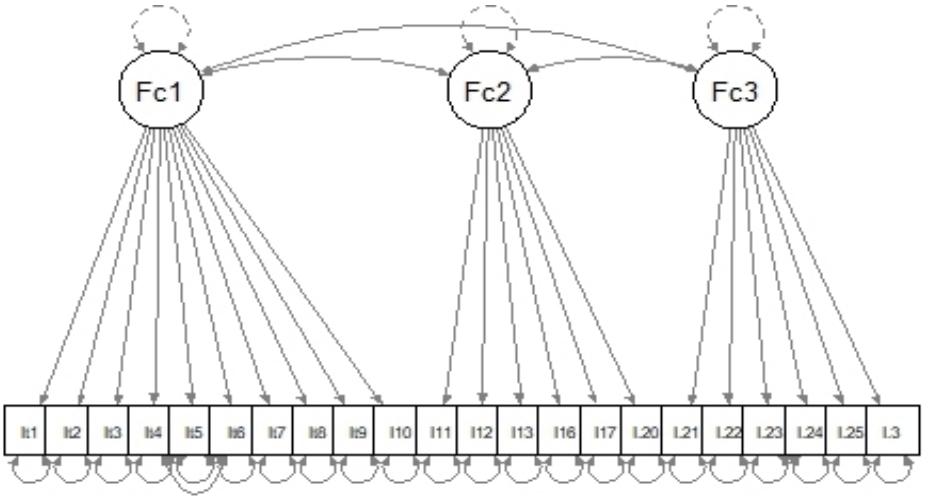


Fig. 1 CFA model of three related dimensions model

TABLE II
CORRELATION BETWEEN DIMENSIONS OF RELATIONAL MOBILITY SCALE (FORM A')

	Opportunity to meet new people	Opportunity to select relationship	Hesitation to be bound to the existing relationships
Opportunity to meet new people	-		
Opportunity to select relationship	0.44	-	
Hesitation to be bound to the existing relationships	0.22	0.32	-

C. Delayed Alternate Form Reliability

After the confirmation of three related dimensions model, the consistency over time and the consistency over two forms (*Form A* and *Form A'*) were examined using delayed alternate form approach. The correlation (0.719) is high which exhibits that there is consistency over two times and over two forms.

Cronbach's alpha for 21 selected items of Form A was 0.820, which indicates a substantial internal consistency within the relational mobility scale. Furthermore, comparison of the two reliability approaches intends to investigate whether the two sources of errors, difference of times and difference of forms, were present and should be considered as a cautious result. The result from delayed alternate form reliability was 0.719 which indicates that relational mobility scale has acceptable stability over time and over parallel forms. While the Cronbach's alpha was 0.820, which indicates high reliability. Furthermore, the difference between delayed alternate form correlation and the Cronbach's alpha value was less than 0.20, which leads to that there was non-significant influence of two sources of errors.

In Table IV, there are strong correlations between Form A and Form A' for each dimension. The highest correlation was found in the relation between dimension *opportunity to meet new people* in Form A and the same dimension in Form A'. It can be concluded that the dimension *opportunity to meet new people* is the most consistent dimension in the scale, following by *Opportunity to select relationship*, and then *Hesitation to be bound to the existing relationships,* respectively.

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TABLE III
THE PARAMETER ESTIMATES OF RELATIONAL MOBILITY SCALE (FORM A)

Item	Estimate	Std.Err	Z-value
Factor 1			
1	0.353	0.04	8.924
2	0.331	0.04	8.197
3	0.419	0.038	10.911
4	0.321	0.047	6.809
5	0.197	0.048	4.125
6	0.299	0.042	7.102
7	0.402	0.041	9.741
8	0.443	0.036	12.200
9	0.508	0.040	12.626
10	0.267	0.036	7.481
Factor 2			
11	0.476	0.035	13.668
12	0.484	0.032	15.360
13	0.264	0.031	8.425
16	0.466	0.033	14.203
17	0.456	0.035	12.968
20	0.340	0.037	9.245
Factor 3			
21	0.600	0.050	12.026
22	0.646	0.048	13.428
23	0.200	0.047	4.284
24	0.152	0.044	3.490
25	0.463	0.047	9.807
30	0.565	0.050	11.352

IV. DISCUSSION

The main objective of this study is to develop relational mobility scale and examine its psychometric properties. This study will significantly fulfill the lack of an objective measurement of relational mobility. Thirty items of the relational mobility scale were newly created in the Indonesia language, in order to develop a relational mobility scale while considering the culture and environment in Indonesia.

The EFA showed that the three factors were sufficient, it can be observed through the acceptable fit test value. According to [12], relational mobility scale consists of three correlated dimensions and these are; 1) the general amount of opportunities to meet new interaction partners in the society, 2) opportunities for people to select their own relationships and groups, and 3) the tendency for individuals to be bound to current relationships or groups.

Similar to [12], the current study found that 30 items loaded onto three factors. Based on the content of the 10 items loaded on the first factor, the label of the first factor was defined as opportunity to meet new people. The six items loaded heavily on the second factor was defined as opportunity to select relationship that they are interested in. Differentiating from [12], instead of labeling the third factor as *tendency to be bound to current relationship*, in this current study, the third factor was defined as *hesitation or unwillingness to be bound to existing relationships or groups*.

The correlations among three factors were quite acceptable, this result exhibits that the multidimensional construct with correlated dimensions [3], which is applicable for the relational mobility scale.

Based on the results of the EFA, the model was assumed to conceive three related factors, and it was then tested by the CFA. The result of CFA has promoted the prior result of exploratory factor analysis. Each factor is represented by 12 items, six items, and six items, respectively. All the items had moderate – high loadings on the latent factors where they were expected to load on. This satisfactory result is indicated by the fit indices which suggested good model fit.

The delayed alternate form analysis showed that the correlation was high, which indicates that the relational mobility scale has consistency according to the time sampling and content sampling. In addition, based on [5], the result of delayed alternate form analysis should be compared to Cronbach's alpha to ascertain the existence of two sources of error. The difference between the delayed alternate form correlation and Cronbach's alpha value is 0.101. When the difference is less than 0.20, it indicates that the two sources of error, time sampling error and content sampling error, are not a major influence on the data [5].

TABLE IV
CORRELATION BETWEEN TIME 1 (FORM A) AND TIME 2 (FORM A') ACCORDING TO THE EACH DIMENSION OF RELATIONAL MOBILITY SCALE

Dimension	Correlation
Opportunity to meet new people	0.562
Opportunity to select relationship	0.477
Hesitation to be bound to the existing relationships	0.392

Furthermore, comparison between result of delayed alternate form analysis when the technique was applied to the whole scale, and when the technique was applied to the dimensions is done. The value for correlation between scales of two parallel forms was higher than the correlation value between each dimension of two parallel forms. It confirms that the scale is multidimensional with correlated dimensions, and using the scale as the whole scale is better than using dimensions separately.

Finally, we can conclude that the relational mobility scale is a reliable scale that can be used to measure and investigate relational mobility in high school students in Indonesia.

V. IMPLICATIONS, STRENGTHS, AND LIMITATIONS

Despite the satisfying findings, one thing should be remembered and that is that the current research was based on students from a high school in Malang Indonesia. Therefore, the findings represent responses of subjects from only one environment. Further studies should gather data from more versatile samples, and diverse environments to ensure the generalizability of psychometric properties of the relational mobility scale. As well as the diverse environment, the sample size is also important to consider, since the generalization of the result is fortified by the sample size.

In this study, the statistical techniques used are EFA and CFA. These techniques are quite popular, especially in the case of construct validity. But the idea of underlying latent factor, which is assumed to causally affect the manifest

variables, is onerous to be interpreted since it is abstract in nature. Therefore, researchers should be cautious while interpreting the results of these statistical techniques. Nonetheless, this research was the first to establish relational mobility with three correlated dimensions for Indonesian population. Researchers who conduct research related to relational mobility with the Indonesian population, will be easily facilitated by the availability of proper measurement.

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