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MAPPING THE HAPPINESS LEVEL DISPARITY OF THE INDONESIAN POPULATION USING MULTIDIMENSIONAL SCALING

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Abstract. *The Central Statistics Agency published a survey report on the happiness of the Indonesian people in 2017. The survey results show that there are disparities that vary between provinces. The province with the highest happiness index was North Maluku, while the province with the lowest happiness index was Papua. Based on this phenomenon, the researcher wants to map the provinces based on the similarity of happiness levels. Researchers used quantitative descriptive methods with data analysis using multidimensional scaling. The results show that the provinces that have similarities with the happiest group are: 1) North Maluku province is like Riau Islands, Gorontalo, North Sulawesi, and Maluku. 2) South Kalimantan is like North Kalimantan, East Kalimantan, DI Yogyakarta, and Bali. 3) DKI Jakarta is like West Papua. 4) South Sulawesi is like West Sumatra, Riau, and South Sumatra. 5) Aceh is like Kep. Bangka Belitung. The less happy group 1) West Java is like Banten, Central Java, Central Kalimantan, Jambi, and East Java. 2) North Sumatra is like Papua. 3) Central Sulawesi is like Southeast Sulawesi, West Nusa Tenggara, Bengkulu, West Kalimantan, West Sulawesi, Lampung, and East Nusa Tenggara.*

Keywords: *happiness index, multidimensional scaling, multivariate.*

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1. INTRODUCTION

Whether we realize it or not, happiness is the goal of life and the pinnacle of human achievement, both personally and collectively in the life of the community, nation, and state. Most people assume that happiness will be achieved by having a lot of material (resources). On the other hand, to fulfill the ambition of obtaining material, limited opportunities and resources have turned human obsession into cruel colonization and oppression of others. In fact, in the last century, many people have attained pseudo-happiness, they have a lot of money, and other resources, but they are not yet happy in the inner dimension. Happiness that is only measured by material achievements, without considering the immaterial dimension, turns out to be wrong and will only give birth to false happiness. Realizing this mistake, the experts formulated the dimensions of happiness, including the Oxford happiness dimension which consists of 3 (three) dimensions, namely; "joy, positive attitude, and reliability" [1], happiness according to the United Nations (UN) is measured through 6 (six) dimensions, namely; "income, trust, life expectancy, social support, freedom, and generosity" [2]. BPS Indonesia has also formulated 3 (three) dimensions of happiness, namely; "life satisfaction, feelings, and meaning of life" [3].

Since 2002, the World Happiness Report has conducted surveys and statistical data processing to determine the position of the happiest countries in the world [2]. The Central Statistics Agency (BPS) of the Republic of Indonesia has conducted the first survey to measure the level of happiness in 2014 and continued with the second survey in 2017.

Based on a report from the world happiness report in 2021, of the 146 countries surveyed, Indonesia's happiness ranking is at number 80 with a happiness index value of 5.345 (scale 0-10), while the country ranked is Finland with a happiness index value of 7.842, and the lowest in the country. Afghanistan with a happiness index score of 2.523 [4].

The results of the BPS happiness survey conducted independently in 2017 showed that there were disparities (gaps) that varied between provinces in Indonesia, the highest happiness index was achieved by North Maluku Province of 75.68 (on a scale of 0-10) while the lowest happiness index was achieved by the Province of North Maluku. Papua with an index of 67.52. The existence of disparities between provinces allows researchers to group provinces based on the similarity of their respective happiness indices.

One of the goals of grouping is to provide information to the government or stakeholders to make certain policies to increase the equality of the happiness index in provinces that have far dissimilarities. This study intends to map the disparity of people's happiness in 34 provinces in Indonesia using the classic multivariate multidimensional scaling (metric) statistical technique, on the 2017 BPS happiness survey data.

According to Fisher 2010 in Isa et al [5], In general, the term happiness is used in place of joy, peace, health, and quality of life. This is because conceptually, all these terms have similar measurement values to each other, which has a positive impact on life that leads to an increase in the quality of life. According to Galvão et al. [1], happiness can be interpreted through; In a hedonistic dichotomous measuring of a well-being viewpoint that seeks to comprehend enjoyable life experiences, people should seek out events that allow them to attain happiness. From the standpoint of eudaemonism, pleasure is not a significant predictor of well-being. "

Happiness is a very important variable in positive psychology, but psychologists have difficulty assessing the level of happiness. Happy people always have good prejudices against themselves and others, throw away sadness, can accept failure, never forget the experiences that life has taught them, always speak and be honest with themselves and others, and are strong in facing all problems [1]. Research from Galvão et al. [1], It has been found that of the 29 items of Oxford's happiness instrument used to measure the dimensions of excitement, positive attitude, and reliability, there are 17 valid and reliable items measuring the dimensions of excitement (6 items), positive attitudes (9 items), and reliability (2 items).

The United Nations developed six dimensions of measuring the level of happiness, namely; "income, trust, life expectancy, social support, freedom, and generosity" [2], on the other hand, the Indonesian Central Statistics Agency (BPS) adapted the measurement of the happiness construct developed within the framework of the Organization for Economic Cooperation and Development (OECD) in 2013 (a simple model of subjective well-being), formulated 3 (three) dimensions of happiness measurement, that is; life satisfaction, feelings, and meaning of life [2] [3]

The dimension of life satisfaction is measured by two sub-dimensions, namely, "personal life satisfaction and social life satisfaction", personal life satisfaction is measured using five indicators, namely, "education and skills, work, household income, health, and home conditions/home facilities". The dimension of social life satisfaction is measured by five indicators, namely; "family harmony, availability of free time, social relations, environmental circumstances, and security conditions" [3]

The feeling dimension is measured by three indicators, namely, "feeling happy, feeling not worried, and feeling not depressed". The third dimension (meaning of life) is measured by six indicators, namely; "independence, environmental mastery, self-development, positive relationships with others, life goals, and self-acceptance"[3]. According to Nemati&Maralani [6]. Life happiness is influenced by several factors, among which can be explained by life satisfaction factors mediated by resilience [3].

Multidimensional scaling, later abbreviated to MDS, is a multivariate statistical technique used to represent the relationship of data empirically as a single set point in one- or two-dimensional spaces of geometry. MDS can also be interpreted as a statistical model used to describe data structures spatially, making them easier to understand. MDS can also be viewed as a data visualization procedure with mapping techniques. [7], [8]. MDS can be used to map perceptions or preferences for a particular object or variable, allowing researchers to determine the relative image felt by a group of motorcycle taxis (can be companies, products, ideas and so on). [7], [9]. The main purpose of MDS analysis is to convert perceptional assessments on the basis of similarity or irredity into distances represented in multidimensional spaces. [9]. Based on the data type used, MDS analysis can be divided into two categories, namely, MDS metrics and non-metric MDS.

Metric or classical scaling methods provide an exact algebraic solution for finding point configurations, given the presence of paired irrigats between them, when these irrigats meet metric inequalities and thus can be represented by Euclidean distances [10]. Suppose there is a set of n objects with irredity $\{\delta_{rs}\}$. MDS Metrics tries to find a set of points in the dimensional space, each point is a representative of one of the objects that lie between the points it can be expressed by the following equation $\{d_{rs}\}$ [11]:

$$d_{rs} \approx f(\delta_{rs}) \qquad (1)$$

Where f is a continuous parametric monotonic function, the function f can be an identity function or a dissimilarity transformation function to a distance form function. Mathematically, suppose an object consists of a set O, dissimilarity is defined at $O\ x\ O$, between objects r and s with $\delta_{rs}(r, s \in O)$. Let $\emptyset$ be an arbitration mapping from O to E, where E is a Euclidean space, although it should not be, where a set of points represents a particular object. So $\emptyset(r) = x_r, r \in O, x_r \in E$, and $X = \{x_r : r \in O\}$, a set of images. The distance between the points x_r, x_s in X is given by d_{rs}. The goal is to map ϕ, for d_{rs} approximately equal to $f(\delta_{rs})$ for all $r, s \in O$[11].

There are two main methods of metric MDS: the classical scaling method and the least squared. The metric MDS with classical scales was first introduced by Young and Householder (1938) shown by how to start calculating the matrix of distances between points in Euclidean space, coordinates for data points can be searched in such a way as to maintain distance [12].

Classical MDS seeks to find isometrics between distributed points in higher dimensional space and in low-dimensional space. [13]. The method for finding the original Euclidean coordinates of Euclidean distance derivatives was first introduced by Schoenberg. (1935) and Young and Householder (1938) as follows [14]:

Suppose the coordinates of a point within a Euclidean dimension p are given by $x_r(r = 1, \dots, n)$, where. $(x_{r1}, \dots, x_{rp})^T$. Then the Euclidean distance of the 1-st and s-th points is obtained from.

$$d_{rs}^2 = (x_r - x_s)^T(x_r - x_s) \qquad (2)$$

There are two stages of the classical multidimensional scaling process, which is calculating the dimensioned B matrix $n \times n$. Suppose the matrix of the inner result becomes B, where $[B]_{rs} = b_{rs} = X_r^T X_s$. The known squared shape of distance, the matrix of inner B results can be searched, and then from unknown B coordinates. To overcome the uncertainty of the solution, the center of the point configuration is placed at the point of origin, namely $\{d_{rs}\}$.

$$\sum_{r=1}^{n} x_{ri} = 0 \qquad (i = 1, .., p)$$

To get B from Equation (1), calculate the value d_{rs}^2;

$$d_{rs}^2 = X_r^T X_r + X_s^T X_s - 2X_r^T X_s \quad (3)$$

so.

$$\frac{1}{n}\sum_{r=1}^{n} d_{rs}^2 = \frac{1}{n}\sum_{r=1}^{n} X_r^T X_r + X_s^T X_s,$$

$$\frac{1}{n}\sum_{r=1}^{n} d_{rs}^2 = X_r^T X_r + \frac{1}{n}\sum_{s=1}^{n} X_s^T X_s,$$

$$\frac{1}{n^2}\sum_{r=1}^{n}\sum_{s=1}^{n} d_{rs}^2 = \frac{2}{n}\sum_{r=1}^{n} X_r^T X_r. \quad (4)$$

By substitution to Equation (4) obtained.

$$b_{rs} = X_r^T X_s,$$

$$= -\frac{1}{2}\left(d_{rs}^2 - \frac{1}{n}\sum_{r=1}^{n} d_{rs}^2 - \frac{1}{n}\sum_{s=1}^{n} d_{rs}^2 + \frac{1}{n^2}\sum_{r=1}^{2}\sum_{s=1}^{n} d_{rs}^2\right)$$

$$= a_{rs} - a_{r.} - a_{.s} + a.. \quad (5)$$

where

$$a_{rs} = -\frac{1}{2} d_{rs}^2,$$

and

$$a_{rs} = n^{-1}\sum_s a_{rs}, \quad a_{.s} = n^{-1}\sum_r a_{rs}, \quad a_{..} = n^{-2}\sum_r\sum_s a_{rs},$$

Matrix A is defined as then the result of the inner matrix B is$[A]_{rs} = a_{rs}$, :

$$B = H.A.H \quad (6)$$

where H is the centering matrix, $H = I - n^{-1}11^T$with $1 = (1, 1, \ldots 1)^T$, a vector of n unit.

To recover the coordinates of the result matrix B, the inner B matrix can be expressed as $B = XX^T$, where $X = [x_1, \ldots, x_n]^T$ is the coordinates of the $n \times p$ matrix. Rating of B, r(B) is $r(B) = r(XX^T) = r(X) = p$. Now B it is symmetrical, semi definite positive and rank p, and has a non-negative eigenvalue and $n - p$ it has an eigen value of zero. Matrix B can be written in spectral decomposition:

$$B = V\Lambda V^T \quad (7)$$

Where $\Lambda = \text{diag}(\lambda_1, \lambda_2, \ldots, \lambda_n)\{\lambda_i\}$ is a diagonal matrix of eigenvalues from B and $V = [v_1, \ldots, v_n]$ corresponding vector eigen matrix normalized so that $V_i^T V_i = 1$. To facilitate, the value of eigen B is labeled in such a way that $\lambda_1 \geq \lambda_2 \ldots \geq \lambda_n \geq 0$. Since $n - p$ has an eigen value of zero, B can be written as:

$$B = V_1 \Lambda_1 V_1^T, \quad (8)$$

Where; $\Lambda_1 = \text{diag}(\lambda_1, \ldots \lambda_p)$, $V_1 = [v_1, \ldots, v_p]$, therefore $B = XX^T$, coordinates matrix X given by $= V_1 \Lambda_1^{\frac{1}{2}}$, where $\Lambda_1^{\frac{1}{2}} = \text{diag}(\Lambda_1^{\frac{1}{2}}, \ldots, \Lambda_p^{\frac{1}{2}})$, and thus the coordinates of the points have been recovered from the distance between the points. Any sign of an eigen vector $\{v_i\}$ leads to invariant solutions to reflection at the point of origin. The steps in the process of the classic MDS algorithm can be summarized into six main steps [15];

1. Calculating Euclidean distance matrix irredity $\{\delta_{rs}\}$
2. Find matrix A =$\left[-\frac{1}{2}\delta_{rs}^2\right]$.
3. Find matrix B= $a_{rs} - a_r - a_{.s+a_{..}}$

4. Find the value of eigen $\lambda_1, \ldots \lambda_{n-1}$ and connect vector eigen $v_1, \ldots v_{n-1}$, where vector eigen is the normalization of $v_i^T v_i = \lambda_i$. If B is not semi definite positive (some negative eigen value), it is best (i) ignore the negative value and continue, (ii) add the corresponding constant c for irredity, $\delta'_{rs} = \delta_{rs} + c(1 - \delta^{rs})$
5. Select a dimension that corresponds to p. Maybe using $\sum_1^p \lambda_i / \sum(\text{positive eigen value})$.
6. The coordinate points of n points in Euclidean dimensional space p are given by $x_{ri} = v_{ir}(r = 1, \ldots, n; i = 1, \ldots, p)$

Given that the observed distance is linearly or proportionally related to the estimated distance model, the least MDS square metric finds a configuration that maps the observed distance to model the estimated distance by minimizing the loss function, S, with the possibility of linear transformation from the observed distance. [7, p. 29]. The least square MDS is defined by a formula:

$$S(d_{ij}, \delta_{ij}) = \sum\sum \left(\delta_{ij}^{-1}(d_{jk} - \delta_{ij})_{ik}^2\right) / \sum\sum \delta_{ij} \qquad (9)$$

The numerator of S, the square difference between the observed distances and the estimated distance of the model given weight So that smaller distances have more weight in the loss function than larger ones. Denominator, it is the normalization tribe that makes S free of scale. The simplified view of the metric's smallest square scaling algorithm is as follows: $\delta_{ij} d_{ij} \delta_{ij}^1 \sum\sum \delta_{ij}$ [7]:

1. Assign points to arbitrary coordinates in dimensional space.m
2. Calculate the Euclidean distance between all point pairs, to form a matrix.
3. Compare the matrix with the matrix estimation model by evaluating the Stress function. The smaller the value, the greater the correspondence between the two.δd
4. Adjust the coordinates of each point at the maximum voltage direction.
5. Repeat steps 2 to 4 until the S value (called Stress) is not reduced.

The main difference between the metric MDS model and non-metric is how the observed distance is assumed to be related to the distance derived from the model. In the metric MDS model, the observed distance is assumed to be linearly related or proportional to the distance derived from the model [7]. Non-MDS has the following formulas:

$$\delta_{ij} = f(d_{ij}) = f\left(\sqrt{\sum_k (x_{ik} - x_{jk})^2}\right) \qquad (10)$$

Where f is the monotone function, includes linear functions, power functions, exponent functions, and logarithm functions. δ_{ij} is the distance observed, d_{ij} is a distance estimate model. Non-metric MDS algorithm calculates d_{ij} estimates based on estimated model coordinates x_{ik} and x_{jk} in such a way that the order of the rank of the d_{ij} estimate as close to the order of the observed distance rank (δ_{ij}). So, this model is the same as the metric model, differing only on the assumption of how the shared data should be associated with the distance estimate model.

2. RESEARCH METHODS

This research uses descriptive methods with quantitative approaches, this method is used with a view to be decrypting empirical facts of the research subject, namely, the disparity in the level of happiness of the people in 34 provinces in the Unitary State of the Republic of Indonesia in 2017.

The type of data used is secondary data, namely, "The processed data from the happiness survey results uses a two-stage random sample withdrawal technique in 75,000 households, 487 regencies/cities in 34 provinces in Indonesia by the Indonesian Central Statistics Agency (BPS) in 2017 contained in the Indonesian Statistics Report in 2021". The variables used are three dimensions forming happiness contract adapted from the measurement of the happiness contract developed in the OECD framework of 2013(A Simple Model of Well Subjective-Being), that is; "Life satisfaction, the dimension of feelings, and the dimension of the meaning of life."

The dimensions of life satisfaction are measured by two sub-dimensions, namely, Personal life satisfaction and social life satisfaction, personal life satisfaction is measured using five indicators, namely, education and skills, employment, household income, health, and home conditions/home facilities. The dimension of social life satisfaction is measured by five indicators, namely; family harmony, availability of free time, social relations, environmental circumstances, and security conditions (BPS, 2021). The dimensions of feeling are measured by three indicators, namely, feelings of pleasure, feelings of not worrying, and feelings of not being depressed. The third dimension (meaning of life) is measured by six indicators, namely; self-reliance, environmental mastery, self-development, positive relationships with others, life goals, and self-acceptance [3]. Variable measurements using a visual rating scale that describes the ladder of life scale at intervals of 0-10, a score of 0 indicates a very dissatisfied/very low perception, while a score of 10 indicates a very satisfied/very high perception, with a score of five as a cut-of [3].

The analytical tool used to describe the similarity or irredity of happiness dimensions in 34 provinces in Indonesia is a classic Double Dimensional Scale Analysis (MDS) or metric. Through the MDS metric procedure can be known data points on the dimensional space of the perception map representing a particular province based on the similarity or irredity of the dimensions of happiness.

3. RESULTS AND DISCUSSION

Data analysis is done by following the steps of multidimensional scaling metric (classic) analysis, namely; (1) Calculates Euclidean distance matrix (δ_{rs}), (2) calculates matrix A, (3) calculates matrix B, (4) calculates the value of eigen ($\lambda_1, \ldots, \lambda_{n-1}$), calculating the value of vector eigen ($v_1, \ldots, v_{n-1}$), (5) determine the appropriate number of dimensions, (6) determine the coordinate points of the n points in the dimension space p. then map the configuration points into the perception map.

Steps 1, 2, 3, and 4: Calculate the Euclidean distance matrix of irredity (δ_{rs}) matrix A, B, and vector eigenvalues. Considering the width of the matrix dimensions (34 x 34) in the results of matrix calculations and eigenvalues in steps 1 to 4, then based on aesthetic considerations (beauty) in this article, we place the results of the calculation in appendix 2). Step 5: Determine the number of dimensions (goodness of fit model). Based on the results of calculations of multidimensional analysis scaling metrics (classical methods) using open-source R software obtained the model accuracy value (goodness of fit model) of 0.8470512, the GOF value approaching 1 indicates that the MDS model with two dimensions, is the right model (fit model). In line with Jacoby & Ciuk opinion [17] and Little et al. [18] there is a set of vectors r-dimensional H in such a way that the Euclidean distance matrix from H is equal to the input matrix. The H set is called the input matrix configuration. If the dimensions of the H set are too high to visualize, then it is necessary to reduce the configuration dimension to 2 or 3 for visualization. Sometimes, a slightly higher dimension is acceptable. Classic MDS will be equivalent to the analysis of major components when classical MDS inputs are in the form of data sets. Step 6: Calculate the configuration points and create a perception map. The result of a metric MDS calculation or classic MDS produces configuration points that are the shapers of the perception map into two-dimensional space, as presented in Table 1 below.

Table 1. MDS Configuration Point

Province	Dimension 1 (X1)	Dimension 2 (X2)
Aceh	- 0,88026	1,43416
North Sumatra	5,07817	1,39449
West Sumatra	- 1,74256	- 0,10372
Riau	- 0,50993	- 1,13642
Jambi	1,84711	- 0,75162
South Sumatra	- 0,83865	- 1,26784
Bengkulu	0,81053	0,11024
Buoys	2,90870	- 0,15140
Kep. Bangka Belitung	0,00323	- 0,15747

Province	Dimension 1 (X1)	Dimension 2 (X2)
Riau Islands	- 2,20931	1,49588
Jakarta	1,31495	0,03559
West Java	3,56042	0,01964
Central Java	0,74172	- 2,24802
IN Yogyakarta	- 2,28058	- 3,74224
East Java	1,39815	- 0,64843
Banten	3,15023	- 0,86912
Bali	- 1,24836	- 2,39967
West Nusa Tenggara	0,95927	1,35884
East Nusa Tenggara	3,66114	2,09798
West Kalimantan	1,94602	0,49912
Central Kalimantan	1,62220	- 1,89877
South Kalimantan	- 1,31062	- 3,17030
East Kalimantan	- 3,06004	- 0,92426
North Kalimantan	- 3,83137	- 2,51979
North Sulawesi	- 3,16998	2,10212
Central Sulawesi	- 1,93082	0,29282
South Sulawesi	- 1,05005	- 1,01656
Southeast Sulawesi	- 0,66735	1,01406
Gorontalo	- 2,56894	1,92258
West Sulawesi	1,05124	0,80218
Maluku	- 3,33218	2,69795
North Maluku	- 6,45733	3,28163
West Papua	0,15970	1,21373
Papua	6,87553	1,23262

Based on the configuration point (Table 1), the dimensions forming happiness in Indonesia are mapped into a two-dimensional perceptual map in Figure 1. Visually in Figure 1, there are configuration points that map the happiness dimensions of 34 provinces in Indonesia in four quadrants based on the similarity of happiness dimensions achieved by each province. The perception map in Figure 1 does not provide unequivocal information and can lead to misinterpretation, for which researchers supplemented the perception map with a dendrogram cluster (Figure 2).

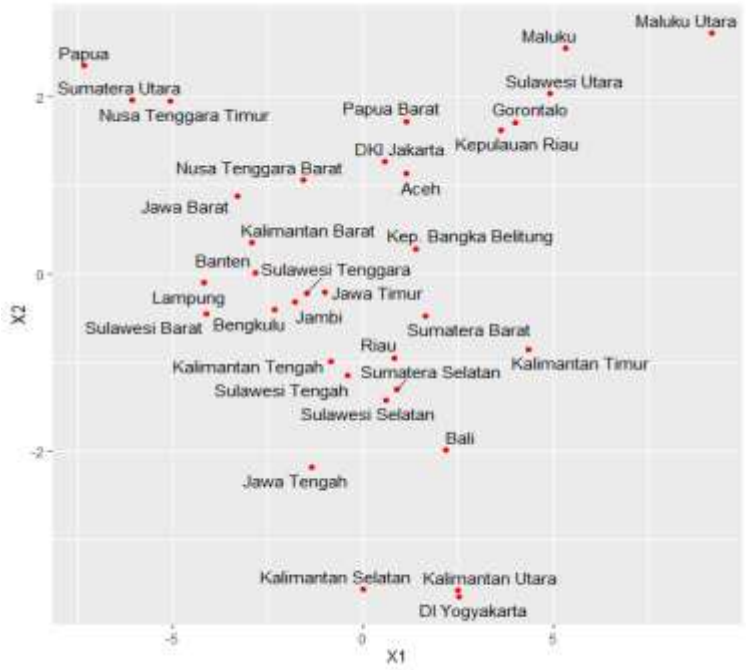

Figure 1. Map of Provincial Perception in Indonesia Based on Happiness Forming Index.

To facilitate the grouping of provinces based on the dimensions of happiness, grouped using dendrogram clusters as shown in Figure 2 as follows:

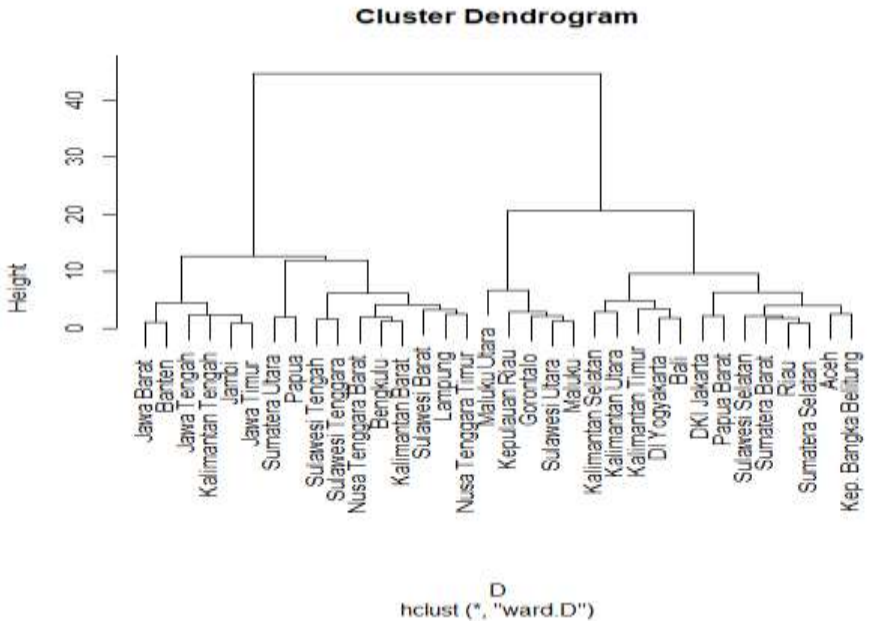

Figure 2. Dendrogram Grouping Provinces Based on Similarities in Happiness Levels.

Looking at Figure 2, it can be interpreted that, based on the index of forming happiness which consists of dimensions of personal life satisfaction, social life satisfaction, feelings, the meaning of life, Provinces in Indonesia are divided into two major groups, namely, the happiest group and the least happy group. Bottom group. The happiest groups are North Maluku, Riau Islands, Gorontalo, North Sulawesi, Maluku, South Kalimantan, North Kalimantan, East Kalimantan, DI Yogyakarta, Bali, DKI Jakarta, West Papua, South Sulawesi, West Sumatra, Riau, South Sumatra, Aceh, and the Bangka Belitung Islands. While the less happy groups are West Java, Banten, Central Java, Central Kalimantan, Jambi, East Kawa, North Sumatra, Papua, Central Sulawesi, Southeast Sulawesi, West Nusa Tenggara, Lampung, and East Nusa Tenggara.

Provinces that have similar dimensions of happiness from the happiest group are: (1) North Maluku Province has a happiness dimension to Riau Islands, Gorontalo, North Sulawesi, and Maluku. (2) South Kalimantan has a happiness dimension with North Kalimantan, East Kalimantan, DI Yogyakarta, and Bali. (3) DKI Jakarta has a similar dimension of happiness to West Papua. (4) South Sulawesi has similar dimensions of happiness with West Sumatra, Riau, and South Sumatra. (5) Aceh has a similar dimension of happiness to Kep. Bangka Belitung. Provinces that have similar dimensions of happiness from the less happy group are: (1) West Java has a happiness dimension with Banten, Central Java, Central Kalimantan, Jambi, and East Java. (2) North Sumatra has a similar dimension of happiness to Papua. (3) Central Sulawesi has a dimension of happiness with Southeast Sulawesi, West Nusa Tenggara, Bengkulu, West Kalimantan, West Sulawesi, Lampung, and East Nusa Tenggara.

4. CONCLUSIONS

Analysis of MDS metrics has produced a perceptual map for the dimensions of happiness in 34 provinces in Indonesia. The happiest provinces can be grouped into five) based on the similarity of the dimensions of happiness, namely, (1) North Maluku province has a dimension of happiness with the Riau Islands, Gorontalo, North Sulawesi, and Maluku. (2) South Kalimantan has a happiness dimension with North Kalimantan, East Kalimantan, DI Yogyakarta, and Bali. (3) DKI Jakarta has a similar dimension of happiness to West Papua. (4) South Sulawesi has similar dimensions of happiness to West Sumatra, Riau, and South Sumatra. (5) Aceh has a similar dimension of happiness to Kep. Bangka Belitung.

Provinces that are less happy form 3 (three) groups, namely: (1) West Java has a happiness dimension with Banten, Central Java, Central Kalimantan, Jambi, and East Java. (2) North Sumatra has a similar dimension of happiness to Papua. (3) Central Sulawesi has a dimension of happiness with Southeast Sulawesi, West Nusa Tenggara, Bengkulu, West Kalimantan, West Sulawesi, Lampung, and East Nusa Tenggara. The limitations of this study are the data sources used are data that have been processed by the Central Statistics Agency of Indonesia, the researchers do not have access to the instruments, and do not know the procedures for developing the instruments.

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