CHAPTER III
METHODS

3.1 Date & Place

This study was conducted from January to March 2021 (Appendix 1) in ITERA, South Lampung.

3.2 Tools dan Materials

Tools

The tools used were Sony A6400 (Focus>55mm) camera, a tripod, and a green backgrounds.

Respondents

Respondents were 100 Indonesian males whose facial photographs were taken. Their aged ranged between 19 to 51 years (Mean age = 27 years, s.d. = 6.33 years) and were recruited in ITERA. Details of respondents were shown in Table 3.1.

Table 3.1 Demographic data of respondents

	Variables	N*	Percentages (%)
Age	Males (27 ± 6.33 years old)	100	100
Ethnicity	Javanese	53	53.00
	Lampung	14	14.00
	Sundanese	8	8.00
	Malay	7	7.00
	Minangkabau	6	6.00
	Others	12	12.00
Occupation	Lecturer	17	17.00
	Staff	23	23.00
	Undergraduate Student	16	16.00
	Cleaning Service	18	18.00
	Security	26	26.00
Level of education	Junior High School	2	2.00
	Senior High School	62	62.00
	Diploma Degree 3	2	2.00
	Bachelor's Degree	17	17.00
	Master's Degree	11	11.00
	Doctoral Degree	6	6.00
Income (Rp.)	<500.000	5	4.76
	500.001 - 700.000	7	6.67
	700.001 - 1.000.000	57	54.29
	1.000.001 - 3.000.000	30	28.57
	3.000.001 - 5.000.000	1	0.95
	5.000.001 - 7.000.000	5	4.76

N* = Number of respondents

Raters

Raters were the individuals who perceived the facial images of participants. The raters were 107 males and 101 females who were randomly recruited in ITERA and areas around Lampung. Their aged varied between 17 - 67 (Mean age males = 27 years, s.d = 8.19 years; females = 26 years, s.d. = 7.98 years). Details of raters were shown in Table 3.2.

Table 3.2 Demographic data of raters

	Variables	N*	Percentages*
Sex	Males	107	51.44
	Females	101	48.56
Ethnicity	Javanese	93	44.71
	Lampung	32	15.38
	Sundanese	19	9.13
	Minangkabau	15	7.21
	Malay	15	7.21
	Others	93	16.35
Occupation	Undergraduate Students	73	35.10
	Academic Staff	50	24.04
	Lecturer	31	14.90
	Security	12	5.77
	Enterpreneur	7	3.37
	Others	30	14.42
Level of education	Elementary School	2	0.96
	Primary High School	12	5.77
	Senior High School	104	50.00
	Diploma Degree 1	1	0.48
	Diploma Degree 3	7	3.37
	Bachelor's Degree	43	20.67
	Master's Degree	36	17.31
	Doctoral Degree	3	1.44
Income (Rp.)	<500.000	23	11.06
	500.001 - 700.000	39	18.75
	700.001 - 1.000.000	20	9.62
	1.000.001 - 3.000.000	65	31.25
	3.000.001 - 5.000.000	54	25.96
	5.000.001 - 7.000.000	3	1.44
	7.000.001 - 10.000.000	2	0.96
	10.000.001 - 15.000.000	1	0.48

N* = Number of raters

3.3 Procedure

Ethical permission

The study was approved by Ethics Committee of the IPB University (No.: 365/IT3.KEPMSM-IPB/SK/2021) (Appendix 2) and the methods were carried out in accordance with the approved ethical approval. All participants was informed about the study and provided the informed consent form before taking part in this study.

Agressivity Measurement

Each respondent was asked to answer the Buss-Perry Aggression Questionnaire (BPAQ) (Buss & Perry, 1992). It is a self-assessment questionnaire which has been widely used in many previous studies (e.g, Gerevich, J., Bácskai, E., & Czobor, P., 2007; Reyna et al., 2011; Bolam et al., 2014; Diamond, P.M., Wang, E.W., & Buffington-Vollum, J., 2015; Paulhus, D.L., Curtis, S.R., & Jones, D.N., 2018; Williams, M.T., 2020). This questionnaire consists of 29 questions to measure aggression and is divided into four scales: physical aggression, verbal aggression, anger, and hostility. The respondents were asked to answer this questionnaire using a Likert-scale between 1 to 5 (which 1 means strongly disagree and 5 means strongly agree) (Appendix 4). Then, total aggression scale (Overall) was calculated by summing the score of physical aggression, verbal aggression, angry, and hostility.

From this calculation, we got minimum, Q1 (1st Quartile), Q2 (2nd Quartile), Q3 (3rd Quartile), and maximum values. Based on those values, we categorized minimum to Q1 values as a low-aggression group, while Q3 to maximum values as a high-aggression group. Meanwhile, Q1 to Q3 values were categorized as a normal group and not including in analysis. This grouping would be used as the basis of "Face Image Grouping" which will be explained in details in section

3.4 Facial Analysis

Facial Photographs

The 100 male facial photographs were captured using a Sony A6400 camera (focus > 55mm). The respondents were asked to stand up 1 meter away from camera in

front of a green background. Their faces showed a neutral facial expression and were perfectly oriented toward the camera (Třebický. V. et al., 2013; Nila et al., 2019).

Photograph Standardization

All the photographs was aligned to standardize the position of the chin and pupils using template line (Figure 3.1) in Adobe Photoshop 2020 version 21.1.3 (Adobe Photoshop, 2019).
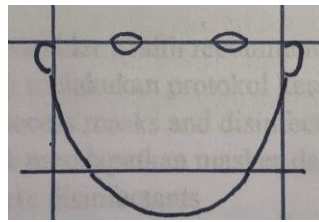
Figure 3.1 Photograph Standardization Template Line
(S. Nila, personal communication, February 25, 2020)

Digitizing Photograph

Photograph digitizing aimed to acquire the face coordinates and was conducted using Psychomorph software (Rowland & Perrett, 1995; Tiddeman, Burt, & Perrett, 2001). A total of 178 coordinates were obtained by manually delineating the face characteristics such as outline of the head, eyes, eyebrows, forehead, nose, jaw, lips, cheeks, and chin (for detail, see Sutherland, 2015; Figure 3.2). Then, the digitized photographs from every group was averaged with Psychomorph software (Rowland & Perrett, 1995; Tiddeman, Burt, & Perrett, 2001).
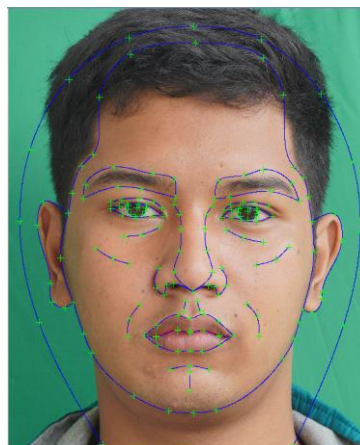
Photograph reproduced with permission
Figure 3.2 Digitizing photograph by Psychomorph

Photograph Grouping

The photographs were grouped based on the total aggression score of BPAQ which was described earlier in Section 3. Then, we created an imaginary face from the average face coordinate of the group member using Psychomorph software for each low-aggression group and high-aggression group (Rowland & Perrett, 1995; Tiddeman, Burt, & Perrett, 2001).

3.5 Face Image Aggresion Level Perception Measurement

Each rater was asked to assess the imaginary faces created from Section 4.4. Each of them was shown by 2 facial photographs: the most aggressive (Q3 and maximum score of BPAQ) and the less aggressive (minimum and Q1 score of BPAQ). To test whether aggressivity perceived on the face or not, each raters was asked to choose which one she/he thought the most aggressive between two averaged photographs Low-Aggression face (LA face) and High-Aggression face (HA face). Female raters were asked an additional question, which one they would choose as a long-last spouse.

3.6 Data Analysis

The linear model was used to see the effect of the demographics data (age, ethnicity, occupation, level of education, and income) on self-declare aggresivity measured by BPAQ. This model also analyzed factors that influence the rater's preference on spouse choice. Rater's perception choosing images was tested using Chi-square. The data analysis was conducted using R software version 4.0.5 (R Core Team, 2021).

Respondents Demographic Factor Influence Aggresion Scale

The generalized linear models (glm) with the gaussian family were used to determine which demographics factor data influence the aggression score. The total aggression scale was set a response. Meanwhile, age, ethnicity, occupation, level of education, and income were set as predictors. Before using glm, we did a collinearity test to see the independence of each predictor (Dormann, C.F. et al., 2013). The collinearity between predictors was tested by calculating variance

inflation factor (VIF) values by applying threshold = 10 (Gareth, J. et al., 2013). The results demonstrate perfect collinearity between occupation and level of education so that the occupation predictor is excluded from glm analysis. Then, the step test determined the optimum model based on the Akaikae Information Criterrion (AIC) formula (R Core Team, 2021). The selected model was a model with the smallest AIC (Bozdogan, H., 1987). The model was validated with k-fold cross-validation by applying k = 10 with boot package (Angelo Canty & Brian Ripley, 2021; Davison, A. C. & Hinkley, D. V., 1997). The final model was obtained after the simplification process. The model could be used if the difference of delta value between the total aggression model and sample is less than 6%.

Raters Demographic Factor Influence Aggressive Face Choice and Mates

Glm with the gaussian family were used to determine which demographics factor data influence mate choice with similar methods on Section 8.1. An additional chi-square was used to analyze the rater's response trends. The responses used were total aggression scale and mate choice, while the predictor used was sex (for aggression male face).