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DEVELOPMENT OF THE REVISED-NEO PERSONALITY INVENTORY FOR INDONESIA: A PRELIMINARY STUDY

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In recent years, the Five-Factor Model of Personality (FFM) has received widespread attention in research on the structure of human personality. Many studies have suggested that personality can be adequately assessed using these five broad dimensions (e.g., Digman, 1990; John, 1990; Costa & McCrae, 1992). Perhaps the most comprehensive and best validated of personality measurement on the basis of Five-Factor Model (FFM) is the NEO Personality Inventory Revised (Costa & McCrae, 1992; in Schinka et al, 1997) which is also the most widely used because it is psychometrically well-developed and can bring considerable interpretative and predictive power to research on the five-factor model (Marshall et al, 1994; Piedmont, 1997; Yang et al., 1999).

Although the NEO Personality Inventory Revised (NEO PI-R) is relatively new, it has been translated into over 20 different languages (including Estonian, Marathi, and Shona). The "universality" of the Five-Factor model of personality as measured by NEO PI-R has been explored in many different cultures (McCrae & Costa, 1997). Using factor congruence coefficients as indices of replication, almost all previous studies have shown values higher than .90 for all five domains. However, there still remain cultures where values, socialization practices, and lifestyles are substantially different (Paunonen et al., 1992, p. 455) from those found in the West, and these need to be studied.

Bahasa Indonesia is a language used by over 200 million residents of Indonesia as an official language. It is based on Malay, but it is quite

distinct from Malay in its development. In the present study, we will examine the reliability and structural validity of the Indonesian version of the NEO PI-R. In Indonesia, only a small number of personality inventories are currently available, which means that adequate adaptation of the present inventory to the Indonesian language and culture can clearly contribute to the development of personality research in Indonesia. As culture and personality are related, a brief review of the geography and stereotypical traits of the Indonesians is desirable to assist us in understanding the possible linkages between Indonesian culture and personality data based on Five-Factor Model.

Geography of Indonesia and Stereotypical Traits of the Indonesians

Indonesia is an archipelago with more than 13,667 islands. The main islands are Sumatra, Java, Kalimantan, Sulawesi, and Irian Jaya. With a population of more than 250 million, Indonesia is the fourth most populous country in the world. The population consists of 150 ethnic groups, each having their own specific culture and language (Koentjaraningrat, 1986). The Javanese (45%) are the largest and most dominant group. Islam is the main religion (88% of the population). Culturally, Indonesia can be considered as one of the most diverse countries of the world.

Many studies of Indonesian people and their culture have been reported (Lubis, 1986; Koentjaraningrat, 1993; Mulder, 1994). Those studies have revealed some of the personality traits and cultural aspects of the Indonesians. The Indonesian people and especially the Javanese often describe themselves as "closed," which means that they rarely or never reveal their true feelings (Mulder, 1992). They tend to be more relatively compromising or submissive when it comes to conflict resolution or interacting with others and especially superiors (Haar & Krahe, 1999). The impact of the "harmony" ethic, which is still highly significant for Indonesians today, can be clearly felt.

Purpose of the Study

The present study had two main purposes. First, the study examined whether the personality factors of the FFM would be found in Indonesian culture with an Indonesian translation of NEO PI-R. Second, mean levels

of personality traits and factors were explored to explain some psychological aspects of Indonesian culture.

Method

Participants

The participants in the present study included both college students and breast cancer patients. The present study is part of a project "Coping with Cancer" being conducted by the first author in Indonesia. The college student sample consisted of 341 students (male students = 65, female students = 276) from the Department of Psychology at the Atma Jaya Catholic University in Jakarta. The students ranged in age from 17 to 21 years ($M = 18.95$, $Mdn = 18$, $SD = 1.68$).

The Indonesian breast cancer sample consisted of 106 female patients who were operated on approximately one month prior to data collection. The patients ranged in age from 25 to 71 years ($M = 50.21$, $Mdn = 50$, $SD = 9.18$). The educational background of the breast cancer patients was distributed as follows: 15.1% elementary school, 10.4% junior high school, 42.2% senior high school, and 28.3% university. It should be noted that the breast cancer patients in this study were rather highly educated and not representative of the Indonesian population.

Recruitment. The students were recruited from psychology classes at the Atma Jaya Catholic University. Those who did not want to participate could leave the classroom. None refused to participate although there was no reward for participation. A standard administration procedure was used to collect the data (see Costa & McCrae, 1992, p. 5).

The breast cancer patients were recruited from three general hospitals in Jakarta (Fatmawati Hospital, Dharma Nugraha Hospital, and Kramat 128 Hospital) and through the Indonesia Cancer Foundation in South Jakarta. The patients were asked to participate in the study and to sign an informed consent form. No reward was provided for participation.

Measures

Costa and McCrae (1992) developed the NEO PI-R, consisting of 240 items assessing five personality factors with six facets for each factor. The five domains of personality are: Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C). The

items are evaluated along a five point-scale ranging from "strongly disagree" to "strongly agree." The data on reliability and validity of the original English version have been summarized in the manual (Costa & McCrae, 1992).

Translation and back translation. The inventory was independently translated into the Indonesian language by two Indonesian psychologists, including the first author. The translations were then compared and discussed to check the similarity of the two versions. Indonesian words more similar to the original English were given preference. However, the same meaning as in the original English was also adhered to as much as possible. The consensual second version was then sent to a bilingual translator unfamiliar with psychological constructs for back translation into English. The first and second authors next compared the back-translated version to the original English version. Items that differed were identified, and both a new translation and back translation were created again.

The Indonesian translation was forwarded to one of the authors of the NEO PI-R, for his approval. He reviewed the back-translation of the Indonesian version, and revisions were made to 12 items. After revising the 12 items, the Indonesian translation of the NEO PI-R was approved for use in this study.

Data Analysis

First, we calculated the internal reliability of the inventory using the Cronbach's alpha coefficient. Second, we factor analysed the raw scores for each sample separately at the facet level, extracted five factors, and rotated the five factors to simple structure using varimax rotation procedure. Then, orthogonal procrustes transformation as described by Schonemann (1966) was used to rotate the varimax solution to a target matrix based on the Costa and McCrae (1992) varimax structure for the U.S. normative sample. The goal is to rotate an observed set of data into a format that is determined *a priori*. The predetermined structure serves as the "target matrix" that the rotation attempts to approximate. The factor loadings of the rotated solution are then compared to the targeted values through use of congruence coefficients. These values determine how well the real data represents the model. Usually congruence coefficient greater than .90 is considered high enough to convey adequate "fit" (Piedmont, 1998). McCrae, Zonderman, et al. (1996) have developed significance values for these statistics.

Results

We computed the alpha coefficients for the NEO PI-R scales for the Indonesian samples. The results are presented in Table 1. When compared to the alpha coefficients for the US normative group and other two South East Asian countries, Malaysia and the Philippines, the alpha coefficients for the different domains were relatively similar across the five groups. The Indonesian samples produced modestly lower alpha coefficients on A ($\alpha = .75$). Comparison of the alpha coefficients for each facet showed almost all of the alpha coefficients for both of the Indonesian samples to be lower than those for the U.S. normative sample. The median of the alpha coefficients at the facet level was .61 for the Indonesian college students (range = .30 - .79) and .56 for the Indonesian breast cancer patients (range = .38 - .83). The median for the other three groups was .65 (range .23 - .74), .65 (range .26 - .73), and .71 (range = .56 - .81) for Malay, Filipino, and U.S., respectively. In addition, the median alphas in Korean and Portugal samples were also found only .64 and .57 (see McCrae et al., 1999). The Indonesian samples produced the lowest alpha coefficients on tender mindedness (A6, $\alpha = .30$ for college students and $\alpha = .38$ for breast cancer patients), the alpha for this facet was also found to be the lowest for the U.S. normative group ($\alpha = .56$) and the Filipino sample ($\alpha = .26$).

Table 1

Alpha Coefficients for the Revised NEO Personality Inventory Domains and Scales in Indonesian Version: Comparison of Studies 1 and 2 with Malay, Filipino, and U.S. Samples

Scale	Study 1 (N=341)	Study 2y 1 (N=106)	Malay (N=451)	Filipino (N=696)	U.S. (N=1000)
Domains					
N (Neuroticism)	.90	.90	.87	.89	.92
E (Extraversion)	.86	.86	.83	.83	.89
O (Openness)	.76	.84	.69	.80	.87
A (Agreeableness)	.75	.78	.82	.78	.86
C (Conscientiousness)	.90	.84	.91	.89	.90

¹ See Revised NEO-PI and NEO FFI Professional Manual (Costa & McCrae, 1992, p.44).

The two Indonesian data sets were factor analyzed at the facet level. When the 30 facet scales were factored using principal component analysis

with varimax rotation, parallel analysis suggested that five factors should be retained (cf. Zwick and Velicer, 1986). The eigenvalues for the five unrotated factors for the Indonesian college student sample were 6.59, 3.56, 2.40, 2.36, and 1.46; the eigenvalues for the five unrotated factors for the Indonesian breast cancer sample were 7.14, 4.17, 2.67, 1.89, and 1.59.

The eigenvalues for the first unrotated factor for the Indonesian college student sample (21.97% variance) was lower than that for the breast cancer sample (23.72% variance). The total percentage of the variance explained by the five factors for the Indonesian college student sample was also lower than the total percentage variance explained by the five factors for the Indonesian breast cancer sample (54.56% vs. 58.01%).

The varimax solution for the Indonesian college students showed some blurring of the factors referring to Extraversion and Agreeableness, while the varimax solution for the Indonesian breast cancer patients showed some blurring of the factors representing Extraversion and Openness. Structural discrepancy from the U.S. normative group was also observed. However, it is also important to note that the sample size of Indonesian breast cancer samples, which are less than 200, might influence the results of these varimax solutions (cf. Guadagnoli & Velicer, 1988).

In order to determine whether the observed structural discrepancies were due to arbitrary rotational differences or not, we performed procrustes rotation. Orthogonal Procrustes Rotations serve as a useful compromise strategy for doing confirmatory analyses using NEO PI-R data. Most notably, it provides a method of evaluating structural fit in a way that is not overly dependent on sample specific variance (Piedmont, 1998). In order to evaluate the degree of fit, congruence coefficients were calculated for each factor scale, with congruence coefficients higher than .90 indicating that a factor has been replicated (McCrae & Costa, 1997); some statisticians argued for values higher than .85 (Haven & ten Berge, 1977). The results of these analyses are presented in Table 2. In this analysis, 26 of the 30 facets had their highest loading on the intended factor in Indonesian college student samples. In Indonesian breast cancer sample, there was only 1 of the 30 facets, which had loading less than .40 on the intended factor. The factor congruence coefficients relating our Procrustes solution were .96, .95, .91, .94, .95 for N, E, O, A, C in a sample of college students and .95, .86, .73, .93, .95 for N, E, O, A, C respectively in Indonesian breast cancer sample. In general, the results of the orthogonal procrustes rotation

for both Indonesian samples show the Indonesian version of the NEO PI-R to be relatively similar to the original English version, with the exception of the openness factor for the Indonesian breast cancer sample. This is an indication that the NEO five factors solution may be suitable for the Indonesian population.

Table 2

Orthogonal Procrustes Rotations of the Indonesian Revised NEO Personality Inventory (NEO PI-R) Facet Scales (N = 341) & (N = 106)

Facet Scales	Study 1 (N = 341)						Study 2 (N=106)					
	I	II	III	IV	V	FaCong	I	II	III	IV	V	FaCong
N1 (Anxiety)	.81	-.09	-.10	.11	-.06	.97	.86	-.12	.03	.06	-.10	.98
N2 (Angry Hostility)	.65	.06	-.07	-.50	.02	.98	.71	.15	-.23	-.40	.00	.92
N3 (Depression)	.75	-.19	-.02	.05	-.22	.99	.85	.09	-.04	-.04	-.16	.99
N4 (Self Consciousness)	.72	-.32	-.07	.11	.01	.96	.73	-.14	.14	.08	-.04	.94
N5 (Impulsiveness)	.55	.28	-.04	-.32	-.36	.98	.54	.22	.15	-.13	-.43	.95
N6 (Vulnerability)	.66	.02	-.22	.04	-.36	.96	.70	-.16	.13	.03	-.35	1.00
E1 (Warmth)	-.16	.74	.12	.28	.12	.98	-.06	.73	.16	.19	.20	.96
E2 (Gregariousness)	-.18	.68	-.05	.13	-.04	.99	-.18	.36	.36	.16	.02	.76
E3 (Assertiveness)	-.33	.52	.18	-.35	.29	.99	-.33	.52	.24	-.38	.27	.99
E4 (Activity)	-.04	.59	.13	-.35	.22	.95	-.20	.59	-.08	-.38	.37	.90
E5 (Excitement Seeking)	-.13	.33	.48	-.27	-.15	.75	-.04	.56	.38	-.18	.06	.87
O6 (Positive Emotions)	-.12	.70	.28	-.03	.07	.97	-.12	.62	.40	.01	.14	.94
O1 (Fantasy)	.12	.05	.63	-.03	-.19	.95	.25	.20	.65	-.36	-.14	.94
O2 (Aesthetics)	.13	.14	.65	.15	.16	.99	.01	.27	.40	-.04	.20	.80
O3 (Feelings)	.30	.38	.47	.02	.21	.77	.18	.41	.58	-.03	-.07	.92
O4 (Actions)	-.43	.30	.25	-.22	-.03	.71	-.34	.41	.43	-.25	.11	.81
O5 (Ideas)	-.13	.04	.70	-.15	.30	.98	-.22	.38	.52	-.34	.29	.78
O6 (Values)	-.21	.14	.31	-.06	-.09	.93	-.11	.01	.47	-.03	-.03	.96
A1 (Trust)	-.30	.24	.02	.59	-.03	.98	-.30	.25	-.13	.63	.15	.91
A2 (Straightforwardness)	-.03	-.11	-.12	.63	.19	1.00	.00	.17	-.51	.40	.17	.66
A3 (Altruism)	-.06	.46	.10	.56	.25	.98	.02	.01	.15	.63	.32	.73
A4 (Compliance)	-.14	-.29	-.10	.66	-.12	.93	-.19	-.16	.05	.77	-.06	.99
A5 (Modesty)	.13	-.31	-.13	.44	-.12	.92	.05	-.11	.39	.52	-.24	.90
A6 (Tender-mindedness)	.28	-.19	.05	.36	-.03	.85	.32	.30	-.31	.58	-.11	.75
C1 (Competence)	-.11	.09	.19	-.01	.71	.91	-.16	.05	.44	-.10	.59	.84
C2 (Order)	.03	.02	-.12	-.03	.79	.99	-.21	-.06	-.31	.04	.66	.73
C3 (Dutifulness)	-.17	-.05	.05	.17	.77	.98	-.05	.23	-.09	.30	.68	.91
C4 (Achievement Striving)	-.08	.18	.19	-.01	.79	.99	.03	-.31	.31	-.03	.60	.94
C5 (Self Discipline)	-.29	.05	.09	.03	.76	.97	-.18	.15	.16	.05	.67	.94
C6 (Deliberation)	-.12	-.20	.03	.28	.64	.97	-.28	-.26	.03	.24	.68	.99
Factcong	.96 ^a	.95 ^b	.91 ^a	.95 ^b	.94 ^b	.95 ^b	.95 ^b	.86 ^a	.73	.93 ^b	.95 ^b	.89 ^a

Loadings greater than |.40| are given in boldface.

Procrustes rotation is targeted to U.S. normative structure.

^a Congruence higher than that of 99% of rotations from random data

^b Congruence higher than that of 95% of rotations from random data (McCrae, Zonderman et al., 1996)

A NEO PI-R Profiles for Indonesia

Table 3

Personality Profiles of Indonesian College Students and Indonesian Breast Cancer Patients

NEO PI-R domain and facets	T-Score (college students)	Range	T-Score (breast cancer patients)	Range
N (Neuroticism)	49	average	51	average
E (Extraversion)	44	low	44	low
O (Openness)	47	average	44	low
A (Agreeableness)	50	average	48	average
C (Conscientiousness)	49	average	50	average
N1 (Anxiety)	50	average	53	average
N2 (Angry Hostility)	47	average	50	average
N3 (Depression)	51	average	54	average
N4 (Self Consciousness)	50	average	48	average
N5 (Impulsiveness)	46	average	42	low
N6 (Vulnerability)	54	average	55	average
E1 (Warmth)	46	average	44	low
E2 (Gregariousness)	48	average	50	average
E3 (Assertiveness)	46	average	47	average
E4 (Activity)	45	average	46	average
E5 (Excitement Seeking)	45	average	44	low
E6 (Positive Emotions)	47	average	44	low
O1 (Fantasy)	46	average	54	average
O2 (Aesthetics)	55	average	46	average
O3 (Feelings)	46	average	46	average
O4 (Actions)	51	average	47	average
O5 (Ideas)	49	average	40	low
O6 (Values)	42	low	42	low
A1 (Trust)	52	average	48	average
A2 (Straightforwardness)	51	average	48	average
A3 (Altruism)	45	average	46	average
A4 (Compliance)	52	average	46	average
A5 (Modesty)	50	average	54	average
A6 (Tender-mindedness)	49	average	48	average
C1 (Competence)	42	low	42	low
C2 (Order)	51	average	52	average
C3 (Dutifulness)	49	average	51	average
C4 (Achievement Striving)	52	average	53	average
C5 (Self Discipline)	45	average	45	average
C6 (Deliberation)	54	average	58	high

Note : N college student = 341

N breast cancer patient = 10

T-score based on U.S. normative groups

T-score norms: 66 ≤ : very high

56-65 : high

45-55 : average

35-44 : low

34 ≥ : very low

In Table 3, the mean *T*-scores for both Indonesian samples are presented. The Indonesian college student sample showed a profile similar to the U.S. normative group of college students with the exception of the domain of Extraversion (E) and some facets of the NEO PI-R. The Indonesian college students produced relatively low scores on values (O6) and competence (C1). The Indonesian breast cancer patients produced relatively low scores in the domains of extraversion (E) and openness (O) and also on several facets of the NEO PI-R, such as impulsiveness (N5), warmth (E1), excitement seeking (E5), positive emotions (E6), ideas (O5), values (O6), and competence (C1). The only facet showing a relatively high score was deliberation (C6).

Comparison of the personality profiles for the two Indonesian samples reveals many similarities and some differences. The differences were not only one domain (O), but also on several facets (N5, E1, E4, E5, E6, O3, O5 and C6). Both of the Indonesian samples scored relatively low on extraversion (E), values (O6), and competence (C1).

Discussion

In general, the results of the present study clearly document the reliability and structural validity of the Indonesian version of the NEO PI-R. Based on the congruence coefficients between the factor solutions for each of the Indonesian samples and the relevant U.S. normative groups, the Indonesian version of the NEO PI-R can be considered to be a good approximation to the original English version with the exception of the Openness domain. In other words, we can be confident that the NEO PI-R is quite similar structurally in both Indonesian and American samples. The failure of the openness domain to produce a high congruence coefficient especially for the Indonesian breast cancer sample may relate either to the Indonesian culture itself or to the cancer disease itself. When we compare the present result with those of several other cross-cultural studies examining the NEO PI-R (Katigbak et al., 1996, Piedmont & Chae, 1997, Rolland et al., 1998, McCrae & Costa et al., 1998, Mastor et al., 2000), moreover, we find the results of our study are quite similar to Malay college student sample regarding the congruence coefficient of openness domain. This finding is understandable with regard to the similarity of language at a certain level. Bahasa Indonesia and Malay language, however, comes

from the same family. On the other hand, both cultures may also have similarity in "trait" such as "dogmatic attachment to values", which might contribute to the failure of producing high congruence coefficient of the openness domain.

Previous studies of the NEO PI-R have also sometimes found a different factor structure prior to procrustes rotation (McCrae & Yik et al., 1998; Piedmont et al., 1997). This has particularly been found in the case for Asian populations where the structures of extraversion (E) and agreeableness (A) were unclear. These domains seem to represent love more than extraversion (see positive loadings on facets E1, E2, E4, E6, A1, A3, and A6) and submission more than agreeableness (see negative loadings on facets E3, E4, and E5; positive loadings on facets A2, A3, A4, and A5) when compared to the original English domains (Piedmont & Chae, 1997; Katigbak et al., 1996). In the present study, the structure found in the Filipino and Korean studies has been replicated by the Indonesian breast cancer sample. Unclear structures for E and A prior to Procrustes rotation were also found in the Indonesian student sample. In the Indonesian college student sample, factors E and A corresponded to Dominance and Love rather than Extraversion and Agreeableness itself as was also found in Japanese sample. This finding may strengthen the possibility of cultural differences between the individualistic society of the West and the collectivist society of the East influencing personality predispositions. Concerning the dimension of individualism-collectivism, the Estonian study of NEO PI-R found that both dimensions might not be uniformly applicable to all cultures (Kallasmaa et al., 2000). Therefore, additional studies from a broader range of cultures are needed.

Based on the personality profiles for the two Indonesian samples, we can conclude that there are some basic similarities and real differences between them. The Indonesian breast cancer patients show lower scores on openness, warmth, excitement seeking, positive emotion, and ideas than the Indonesian college students. In contrast, they show higher score on deliberation than the Indonesian college students. These differences are presumably a result of having cancer. Low *T*-scores on these facets of the NEO PI-R may certainly be associated with the weakened physical and psychological conditions of cancer patients, who usually show a lack of energy and difficulties with the expression of their emotions (Temoshok, 1987). It is not surprising that we found cancer patients no longer having

an interest in excitement seeking. They are presumably too tired or too weak for such activity. Psychologically they may also tend to become more anxious or depressed, and this may lead them to lose their interest in interpersonal intimacy. They may also tend to think about their disease more than other things with positive emotions and ideas low as a result. The low scores of Indonesian breast cancer patients on openness may also be associated with age. McCrae, Costa, and de Lima et al. (1999) found a consistent change in personality profiles between college and middle adulthood. While scores for three of the five major personality factors tend to decline with age (N, E, and O), the scores for two of the five factors (A and C) tend to increase with age (McCrae, Costa, and de Lima et al., 1999). It is also possible that the low scores on openness (O) found for Indonesian breast cancer patients relative to Indonesian students are due to age.

To close, a number of interesting conclusions can be drawn on the basis of the present findings. First and despite the potential obstacles presented by deep differences in language and culture, the Indonesian version of the NEO PI-R appeared serve its purpose quite well. The Indonesian version of the NEO PI-R may constitute a useful instrument for personality assessment in Indonesia. Further research is nevertheless still needed in light of the low internal reliability for some facets of the inventory and the "low" congruence coefficients found for the openness domain. Second, clear differences in the personality profiles for Indonesian college students and Indonesian breast cancer patients were observed. The next question is whether these differences are caused by the disease itself or by age. Third, clear similarities in the personality profiles of the two Indonesian samples were also documented and may clearly be the product of Indonesian culture being part of collectivist society. Low scores for extraversion (E), values, and competence may be "specific" to the Indonesian personality profile. Indonesian samples tend to be "closed," conservative, and conforming. They rarely show their "real" emotions, which may be a means for staying polite and avoiding conflict. In closing, it is important to note that neither of the Indonesian samples in the present study were representative samples of the Indonesian population. In other words, the results of the present study and the Indonesian personality profiles described here should be interpreted with caution.

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