The Proficiency Edward Personality Preference Schedule in Education Assessment

Eka Sakti Yudha[1*], Agus Taufiq[2]

[1] Universitas Pendidikan Indonesia, Indonesia. [2] Universitas Pendidikan Indonesia, Indonesia.

Abstract

The study aimed to conduct a Rasch analysis of the Edward Personality Preferences Schedule (EPPS) to evaluate and enhance the instrument's precision. Responses of 3.125 students in West Java, Indonesia, were subjected to Rasch analysis using the partial credit Rasch model. The Initial analysis supported the use of the Rasch model, and acceptable reliability (person separation index= 0.82) was observed. By creating super-items, a local dependency between items increased model fit, reliability (person separation index =0.85), and unidimensionality. Infit and outfit statistics for all items satisfied the criterion for construct validity. Almost all items except (17, 97, 126) had suitable point-measurement correlation, reflecting content validity. Item characteristic curves indicated that What evenly distributed roughly 225 items along the person ability continuum. The modified EPPS showed excellent reliability for a measure in assessing the overall potential ability of the students. The item would be added related to the person ability estimates. And Who should omit several items to ensure construct validity.

Keywords

Edward Personal Preference Schedule (EPPS); validation; education; guidance and counseling

Abstrak

Penelitian ini bertujuan untuk melakukan analisis Rasch dari Edward Personality Preferences Schedule (EPPS) untuk mengevaluasi dan meningkatkan presisi instrumen. Respon dari 3.125 siswa di Jawa Barat, Indonesia, dilakukan analisis Rasch menggunakan model Rasch kredit parsial. Analisis awal mendukung penggunaan model Rasch, dan keandalan yang dapat diterima (indeks pemisahan orang = 0,82) diamati. Dengan membuat super-item, ketergantungan lokal antara item meningkatkan kecocokan model, keandalan (indeks pemisahan orang = 0,85), dan unidimensionalitas. Statistik infit dan outfit untuk semua item memenuhi kriteria validitas konstruk. Hampir semua item kecuali (17, 97, 126) memiliki korelasi titik-pengukuran yang sesuai, yang mencerminkan validitas isi. Kurva karakteristik item menunjukkan bahwa Apa yang didistribusikan secara merata kira-kira 225 item di sepanjang kontinum kemampuan seseorang. EPPS yang dimodifikasi menunjukkan keandalan yang sangat baik untuk ukuran dalam menilai kemampuan potensi siswa secara keseluruhan. Item akan ditambahkan terkait dengan perkiraan kemampuan orang tersebut. Dan Siapa yang harus menghilangkan beberapa item untuk memastikan validitas konstruk.

Kata kunci
Edward Personality Preferences Schedule (EPPS); validasi; pendidikan; bimbingan dan konseling

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(*) Corresponding Author: Eka Sakti Yudha, Universitas Pendidikan Indonesia, Indonesia, Email: eka_bk@upi.edu

INTRODUCTION

Psychological test tools are used to reveal the psychological aspects of a person; therefore, the procedures and tools used in psychological examinations are very dependent on the psychological and behavioral aspects to be examined (Ashton & Lee, 2021). Based on the measured psychological aspects, psychological tools can be divided into intelligence tests, aptitude tests, personality tests, and interest tests (Zheng et al., 2020). One of the test tools mentioned above is a personality expression tool. Personality expression tools are very useful in the world of education. The term personality is often used in various meanings and meanings (Nick Cochran et al., 2020; Zheng et al., 2020). Experts in defining personality vary widely, depending on which side of the personality is approached/viewed. Therefore there is no single definition of personality. However, the most general and comprehensive understanding begin with humans' conception (Ashton & Lee, 2021).

The current view of psychologists in America is based on the assumption that humans (individuals) are reactive behavioral, while those developing in continental countries view individuals as self-active. According to Volk et al. (2021), four pathways influence personality theory: (1) clinical observation initiated by Charcot and Janet. Including figures in this genre are Sigmund Freud, Jung, and McDougal, (2) the Gestalt tradition and Wiliam Stern, which consider that unity of behavior is the basis for interpreting personality, (3) experimental psychology learning theory directs the study of personality through empirical analysis. Control, and (4) the psychometric tradition that highly appreciates quantitative measurements.

Given the various views above, Hogan & Sherman (2020) concludes that as a result, the classification of personality theory can be different. The classification is arranged depending on the author's point of view and the order. For example, Cooper (2019) classifies the existing personality theory models into three models: the conflict model, the fulfillment model, and the consistency model, whether seen from the core of the personality or the surface (peripheral). Jackson et al. (2019) categorized to make it easier to study the contents and classify personality theories into five groups. The five groups are (1) psychoanalytical-psychophysical. Included in this group are Freud, Jung, and H.A. Murray;

(2) psycho individual psychosocial (Adler, Horney, and Moreno); (3) Self-integrative-biosocial (Allport, Rogers, and Murphy); (4) psychobiological (Sheldon); and (5) Psychostatistical. At the end of the discussion of the nineteen theories presented, Hogan & Sherman (2020) concluded that none of the 19 theories are identical, even if there are similarities. The theories are more complementary than contradictory.

EPPS has been used massively in the selection and placement process of students in schools or used as reference material in providing guidance and counseling services. However, standardization has not been carried out in a structured manner (Nurhudaya et al., 2019). Moreover, this EPPS is a test adapted since 1973, at least 36 years old. So there needs to be a review of whether the item questions and alternative answer choices are still good or whether there needs to be an adjustment/revision.

METHOD

Participant

The sample of this research was random, where a selected 11 senior high schools in West Java province-Indonesia. Schools 3.125 students (Male=1.317, Female=1.808) of various abilities but the same age group (table 1).

Table 1. Person Groups for DIF Analysis

Gender	Age group	School Category
Male (n= 1.317)	16 to 19 years	Public (8 schools= 72%)
Female (n= 1.808)		Private (3 Schools= 28%)
N= 3.125		

Prosedur

This survey was conducted from March 2019-June 2020. This research involved seven trained testers in administering the EPPS instrument and the research flow to be carried out. The period used for the test was 40 minutes.

RESULT AND DISCUSSION

Summary Statistics

Overall, EPPS has reliable reliability (Cronbach Alpha = 0.85), with an average score (x = -0.11), which means that students' ability, in general, is below the average level of standard difficulty. The consistency of the answers from the respondents was excellent (Person reliability = 0.86) with excellent quality of the items (item reliability = 1.00).

Table 2. Summary of All Rasch model person statistics

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
MEAN	17.4	35.6	-.11	.43	.99	-.1	1.11	.1
S.D.	6.3	1.5	1.16	.06	.22	1.1	.79	1.1
MAX.	35.0	36.0	4.44	1.07	2.03	3.9	9.90	5.0
MIN.	1.0	14.0	-4.36	.40	.44	-3.5	.17	-2.9
REAL RMSE	.46	TRUE SD	1.07	SEPARATION	2.35	Person RELIABILITY	.85	
MODEL RMSE	.44	TRUE SD	1.08	SEPARATION	2.46	Person RELIABILITY	.86	
S.E. OF Person MEAN = .01								

Table 3. Summary of All Rasch model item statistics

SUMMARY OF 12.343 MEASURED Person

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
MEAN	5959.3	12209.3	.00	.02	.99	-.6	1.12	1.5
S.D.	3055.7	170.6	1.44	.00	.08	6.2	.36	7.4
MAX.	10390.0	12340.0	3.03	.04	1.13	9.3	2.78	9.9
MIN.	743.0	11624.0	-2.19	.02	.84	-9.9	.71	-9.9
REAL RMSE	.02	TRUE SD	1.44	SEPARATION	59.29	Item RELIABILITY	1.00	
MODEL RMSE	.02	TRUE SD	1.44	SEPARATION	60.28	Item RELIABILITY	1.00	
S.E. OF Item MEAN = .24								

If analyzed further, several things will affect the quality of test scores, especially psychological test scores. In addition to the quality of the test instrument, these are (1) test taker (who is implementing it, an expert or who), (2) the person being tested (testee condition, etc.), (3) administration (corrector, answer key), record keeping, and the process of recording scores), (4) recording the time of the test, and (5) the atmosphere of the test itself. Concerning testing administrators, the person who carries out the psychological examination is the key to objectivity about the data obtained. Therefore in this study, several trained testers who have been equipped with several competencies are involved in administering the test appropriately so that the results obtained can be ascertained that they are free from human error.

Fit Statistics

The most common item misfit or outfit indices use the information weighted index (Infit Mean Square or IMS) and the unweighted index (the Outfit Mean Square or OMS). Table 4 provided infit and outfit statistics for all items included in EPPS. Based on the criteria (Briggs, 2019) to check the suitability of the items, it can be concluded that all the items on the EPPS meet the criteria, meaning that there is no need for questions to be discarded or replaced.

Tabel 4 Item STATISTICS: MISFIT ORDER

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	Item
36	743	11624	3.03	.04	1.13	4.0	2.78	9.9	A .05	.24	93.5	93.7	I0036
32	1873	11942	1.93	.03	1.09	5.4	1.66	9.9	B .22	.34	84.5	85.0	I0032
29	1652	12118	2.13	.03	1.07	3.7	1.64	9.9	C .23	.32	86.6	86.8	I0029
28	1992	11883	1.83	.03	1.07	4.1	1.41	9.9	D .26	.34	83.9	84.0	I0028
24	2903	12204	1.34	.02	1.07	6.1	1.36	9.9	E .30	.38	77.6	78.4	I0024
31	2436	12133	1.59	.02	1.04	2.7	1.32	9.9	F .31	.36	81.2	81.2	I0031
34	1676	11760	2.05	.03	1.01	.4	1.32	7.7	G .30	.33	86.6	86.3	I0034
30	3114	12009	1.19	.02	1.04	3.3	1.30	9.9	H .34	.39	77.5	76.9	I0030
27	2448	12169	1.59	.02	1.01	1.0	1.25	8.2	I .33	.37	81.4	81.2	I0027
35	2485	12111	1.55	.02	1.03	2.0	1.24	7.9	J .33	.37	80.9	80.9	I0035

Various psychological attributes measured by psychological tests can predict future individual behavior, particularly concerning the client's decision. These psychological attributes are his abilities, interests, and personality. These three things are pretty stable factors in determining academic decisions and placements. (Andrich & Pedler, 2019) says, "... in choosing a course of psychotherapy for the client, measures of the person's mathematical ability may not be very useful or relevant, although the same measures might be beneficial and relevant in general academic admissions and placement decisions".

Content Validity

The construct validity of the EPPS scale (unidimensionality test) by taking into account the natural variance obtained an index of 29.0%, close to 0.30 (30%). It implies that the Indonesian version of the EPPS scale items has a suitable category for measuring the diversity of respondents' abilities and comprehensively measuring one variable. The validity of the EPPS item resulted in a positive number at $p < 0.05$. It means that respondents can correctly perceive the validity of all EPPS items adapted to the Indonesian culture. The Cronbach alpha value is 0.86, which is in the excellent category. Its unidimensionality index is 36.5%, which is in the excellent category. According to (Briggs, 2019), when analyzed, the questions in EPPS include problems that can be used as a measuring tool for all essential and analytical operations that exist in higher thinking processes. That is why EPPS is very useful to get an overview of the speed, speed, and learning success that a person might achieve in a particular field of study.

Some literature states that intelligence test scores are always interpreted based on their comparison with scores in the peer group. Therefore, the norms used always include the age group. On the other hand, based on the trial results, it was also found that the total score on intelligence tests (especially EPPS) in children to late adolescence (students) the total score increased. At the same time, it tended to decrease with age in adults. It can be examined from the following trial results. In reliability testing, the reliability figures are increasing from children to adults. For example, based on the results of the Foulds trial (Andrich & Pedler, 2019) by re-test, the reliability score was 0.76 for children aged 10.5 years, 0.86 for the 12.5 year age group, and 0.91 for the student group and adult. The results of these trials indicate that the higher the level of age (school), the higher the level of reliability.

Differential item functioning

DIF (differential item functioning) is a bias in measurement, meaning whether an item is more in favor of one individual with specific characteristics. On the other hand, the opposition is disadvantaged. For example, in the EPPS item number 17, from the DIF curve, it can be seen that item number 17 is easier to answer correctly by women compared to men with a significant difference. Curve 1 illustrates the DIF of the items in the EPPS. The criteria for determining DIF are items that have a prob value <0.05; based on these criteria, there are three questions that contract DIF.

Tabel 5. Differential Item Functioning

Person CLASS	DIF MEASURE	DIF S.E.	Person CLASS	DIF MEASURE	DIF S.E.	DIF CONTRAST	JOINT S.E.	t	Welch d.f.	Prob.	Mantel-Haenszel Chi-squ	Prob.	CUMLOR	Size Item Number	Name
	-2.34	1.12	*	-1.01	.96	-1.33	1.47	-.90	11	.3852				2	I0002
	-2.34	1.12	0	-1.68	.62	-.66	1.28	-.52	16	.6131				2	I0002
	-2.34	1.12	1	-1.70	.10	-.63	1.12	-.56	9	.5863				2	I0002
	-2.34	1.12	2	-1.78	.15	-.56	1.13	-.50	10	.6302				2	I0002
	-2.34	1.12	3	-1.33	.27	-1.01	1.15	-.88	12	.3965				2	I0002
	-2.34	1.12	4	-1.66	.15	-.68	1.13	-.60	10	.5619				2	I0002
	-2.34	1.12	5	-2.07	.03	-.27	1.12	-.24	8	.8168	.3333	.5637		2	I0002
	-2.34	1.12	6	-.92	.30	-1.42	1.16	-1.23	12	.2438	.0000	1.000		2	I0002
	-2.34	1.12	7	-.90	.11	-1.43	1.12	-1.28	9	.2339				2	I0002
	-2.34	1.12	8	-1.61	.13	-.72	1.13	-.64	9	.5368				2	I0002
	-2.34	1.12	*	-2.06	1.15	-.28	1.60	-.17	10	.8670				3	I0003
	-2.34	1.12	0	-2.09	.66	-.25	1.30	-.19	16	.8513				3	I0003
	-2.34	1.12	1	-1.86	.10	-.47	1.12	-.42	9	.6841				3	I0003
	-2.34	1.12	2	-1.88	.15	-.45	1.13	-.40	10	.6964				3	I0003
	-2.34	1.12	3	-1.47	.27	-.87	1.15	-.75	12	.4664				3	I0003
	-2.34	1.12	4	-1.15	.15	-1.19	1.13	-1.06	10	.3160				3	I0003
	-2.34	1.12	5	-2.14	.03	-.20	1.12	-.18	8	.8617	.3333	.5637		3	I0003
	-2.34	1.12	6	-1.39	.28	-.95	1.15	-.82	12	.4274				3	I0003
	-2.34	1.12	7	-1.06	.11	-1.27	1.12	-1.13	9	.2858				3	I0003
	-2.34	1.12	8	-1.99	.14	-.34	1.13	-.30	10	.7667				3	I0003
	-1.67	.86	*	-3.16>	1.57	1.50	1.79	.84	8	.4275				4	I0004
	-1.67	.86	0	-3.16	.83	1.50	1.20	1.25	20	.2244				4	I0004
	-1.67	.86	1	-1.94	.10	.27	.87	.31	9	.7635	.0000	1.000		4	I0004
	-1.67	.86	2	-1.55	.14	-.12	.88	-.14	10	.8936				4	I0004
	-1.67	.86	3	-1.48	.27	-.19	.91	-.21	13	.8396				4	I0004
	-1.67	.86	4	-1.58	.15	-.09	.88	-.10	10	.9207				4	I0004

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