Application Rasch Model in Determining The Validity And Reliability Of The Malaysian Armed Forces Spiritual Assessment Instrument: A Pilot Analysis

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ABSTRACT

The objective of this pilot analysis is to validate and investigate the reliability of instruments employed to evaluate Malaysian military personnel's (MMSA-i) spiritual well-being. The instrument comprises 205 items and is distributed to 44 Muslim Malaysian Armed Forces (MAF) personnel in Selangor and Kuala Lumpur, Malaysia. This instrument was developed to measure four dimensions: i) faith appreciation; ii) worship appreciation; iii) morals appreciation; iv) appreciation of Islam in the Pledge of Allegiance MAF. In this pilot analysis, the Rasch model was utilised to test the instrument's validity and reliability. The Rasch model is used to assess both respondent and item reliability and is, therefore, more robust than relying solely on Cronbach's Alpha. Item functioning was assessed employing the Winsteps Version 5.0.2.0 programme in regards to reliability and item-respondent separation, as well as

the suitability and polarity of items measuring constructs and centralised residual correlation values. Additionally, it permits item abortion based on item polarity, item suitability and dependent value determination using standardised residual correlation values. As a result of failing to fulfil the screening criteria, ten items were excluded from the final analysis. The final instrument has 190 items that were intended to measure the four spiritual assessment constructs. Since this is a pilot analysis, the distribution of actual respondents can be conducted to assess all four dimensions of spiritual assessment for Muslim military members in the MAF and develop the MAF members' spiritual profile further.

Keywords: Rasch model, validity, reliability, spiritual assessment, Malaysian Armed Forces

1. INTRODUCTION

As the national defence leader, the Malaysian Armed Forces have gone through various eras of development and transformation in response to technological advances and strategic environmental conditions. Consistent efforts are required to form a credible, balanced, and competent force capable of defending this country's territorial sovereignty. For example, [1]contends that developing military strength encompasses more than just equipment and physicality and the spiritual questions that shape the soul characters of Muslim soldiers.

Spirituality is an intangible that must be prioritised for the Malaysian Armed Forces (MAF) to be regarded as a respected force. Internal aspects of a soldier, as per [2], are similarly intangible and abstract and must be interpreted and empirically validated by systematic and objective examination in order to produce a benchmark. To establish if military personnel have strong intangible traits, each strength and weakness must be examined and utilised as a benchmark toward attaining the intended objectives and mission.

The role of the military's internal aspects (intangible) is interconnected and impacts the excellence of defence resources and organisations [3, 4]. It is also argued by [5] and [6], claiming that internal aspects of human defence such as morale, fighting spirit, and spirituality are intangible factors influencing the performance of defence human resources and the MAF organisation itself, either positively or negatively.

According to [7], one of the indicators of internal defenceman problems is adverse external defenceman disorders such as misconduct, disciplinary cases, and negative case symptoms. This fact is also supported by studies conducted in other countries, such as the [8], [9-11]. However, because of the imbalance in assessing and measuring internal and external aspects in MAF, internal aspects of defence resources cannot be assessed and viewed systematically. This can be seen in the assessment of external aspects (tangible) in the form of MAF materials that assess and measure combat power, mobility, communication and firepower. Integrating these internal and external aspects as a systematic measurement is critical for MAF to become an excellent organisation [12]).

It will also serve as a systematic indicator of the intangible aspects of spirituality concerning MAF's core values [13]. According to [14]), the existence of an instrument in assessing and measuring the internal (intangible) aspects of human defence, including the spiritual, is a determining factor. This is a forced driving factor to a member that makes him brave and full of enthusiasm to fight without fear, weakness, or desperation [15].

As a result, there is a need for a systematic instrument for effectively and sustainably assessing aspects of Malaysia's military spirituality. Based on this, the researcher conducted interviews with top informants in the management and operation of the MAF during phase 1 of the need analysis study. It is followed by phase 2, design and development, in which a panel of field experts agrees on the development of a

Malaysian military spiritual assessment instrument. Following an analysis of the data using the Fuzzy Delphi method, the researcher created a questionnaire instrument to create a Malaysian military spiritual assessment tool. As a consequence, a pilot study was conducted to confirm the questionnaire instrument's strong validity and reliability. The scholar then utilised the Rasch model to establish the questionnaire instrument's level of validity and reliability. Instead of only focusing on the Cronbach's Alpha value, this technique enables further in-depth analysis of each item. This Rasch model method enables for more detailed analysis, for instance, assessing each item's functioning.

2. LITERATURE REVIEW

2.1 Rasch Measurement Model

The Rasch model is a way of calculating the probability of a participant (human) and an item interacting. Each individual is divided into groups based on their abilities, while items are divided into groups based on their complexity. The Rasch model can accommodate for the individual addressing the instrument's abilities and capabilities, as well as the difficulties of every question or item. Through the transition of ordinal data to interval data, individual abilities and item challenges are displayed in logit form. This model can anticipate how individuals from various abilities will react to items of varying degrees of complexity [16]. The probability of accomplishment is determined by the disparity between the individual's abilities and the item's difficulty. Moreover, [17]argue that the capabilities of the Rasch model are, (i) the more intelligent person has a greater probability of agreeing with all items, and (ii) the simpler item has a high probability of being agreed by all persons. The Rasch model can also provide accuracy of validity and reliability values because it pays attention to persons and items. Even these models can indicate which items or constructs are fit (matched), misfit (do not match), need to be reviewed or dropped [4, 9, 10, 18] based on a set range scale.

2.2 Malaysian Armed Forces

The Malaysian Armed Forces (MAF) consists of three services: the Malaysian Army (RMA), Royal Malaysian Navy (RMN), and Royal Malaysian Air Force (RMAF) [19]. The MAF was formed by the British Army and was initially named the Federal Armed Forces, as per [19]. The Federal Armed Forces were renamed the Malaysian Armed Forces after Malaysia was created on September 16, 1963. The British turned over the management and administration of the ATM to the Malaysian government in 1967. The ATM was regulated primarily by the locals from that moment onward [20].

2.3 Instrument

Instruments are official documents that are legally valid and in accordance with certain rules that state the rights of the parties involved in a contract, instruments and relevant official documents in the field of finance [21]. The term "instrument" used in the context of this study is related to the results of the needs analysis carried out on the spiritual assessment of military personnel in Malaysia based on the questionnaire developed. Other terms such as "model" or "module" are outside the context of this study.

2.4 Spirituality

In the context of the Malaysian military, this spirituality means the internal element (intangible), which is the driving force factor for a member of the military in the MAF to function well and effectively. This spirituality is born from the true belief and practice of

action consistently in life so that it becomes a culture and appreciation in the life of a member of the MAF ([18]).

3. DATA ANALYSIS BASED ON RASCH MEASUREMENT MODEL

Numerous diagnoses are frequently used in the Rasch measurement model, which aims to test and verify an instrument's validity and reliability. Among them are the following: (i) determine the item and responder separation's reliability and index; (ii) evaluate the item's polarity and the participant's ability to measure the construct; (iii) Principal component analysis; (iv) find the instrument's appropriateness (item fit) in the assessment instrument; and (v) depending on standardised residual correlation values, establish dependent items. To discover the discrepancies between two variables, level measurement and correlation, Rasch's technique may be utilised to assess research outcomes data. However, this work employs the Rasch model technique to evaluate the validity and reliability of a questionnaire instrument generated via qualitative data collected in a pilot study. Typically, the validity and reliability of an item are determined solely by the instrument's overall Alpha value.

4. OBJECTIVES

The aim of this pilot study was to determine the instrument's reliability as well as any shortcomings. In this pilot analysis, the scholars investigated item functioning in terms of item-respondent separation and reliability, item-respondent suitability and polarity, principal component analysis, item fit, and standardised residual correlation values.

5. METHODOLOGY

This pilot analysis employed a quantitative approach, which involved the distribution of research instruments in studying participants. This pilot analysis enrolled 44 Muslim military personnel in Selangor and Kuala Lumpur, Malaysia. This pilot study has a sufficient number of participants since [22]) concluded that a pilot study's acceptable number of participants should be between 25 and 100 respondents. Simultaneously, [11] proposed that a pilot study utilised for initial investigation or scale development include a limit of 30 respondents.

The pilot study's findings were analysed using the Winsteps Version 5.0.2.0 software in conjunction with the Rasch measurement model approach. This Malaysian military spiritual assessment instrument (MMSA-i) consists of 190 items divided into four main dimensions: appreciation of faith, appreciation of worship, appreciation of morals and appreciation of the Malaysian Armed Forces' Pledge of Allegiance.

6. RESEARCH FINDINGS

The author applied the Rasch model technique to investigate item functionality from the perspectives of (i) reliability as well as the item and participant separation; (ii) PTMEA CORR values to recognise the polarity of items and participant measuring constructs; (iii) principal component analysis; (iv) fit of the construct measuring item; and (v) standardised residual correlation values to ascertain the dependent items. The functionality check for each item is discussed in the next section.

6.1 Reliability and Separation of Items

The appropriate value of Cronbach's Alpha (α) for reliability, according to the Rasch measurement model technique, is between 0.71 – 0.99, which is at the optimum level (71% – 99%) as indicated in Table 1.1 [10].

Table 1.1

Interpretation of Alpha-Cronbach Scores (Bond & Fox, 2007)

Alpha-Cronbach Scores	Reliability
0.9 – 1.0	Exceptionally good and effective, with a high level of consistency
0.7 – 0.8	Good and reasonable
0.6 – 0.7	Reasonable

Concerning the reliability values and item separation, statistical analysis with the Rasch measurement model technique was performed to assess the reliability of items in the instrument. According to the results of the pilot study, the reliability value derived using Cronbach's Alpha (α) is 0.98, as presented in Table 1.2. This value indicates that the instrument is in outstanding condition and has a high level of consistency, indicating that it is being utilised in actual research.

Table 1.2

Pilot Study Reliability Values (Cronbach's Alpha)

CRONBACH ALPHA (KR-20) Person Raw Score Test Reliability = .98
STANDARDIZED (50 Item) Reliability = .73

The instrument is also investigated holistically, with the reliability and separation of items and participants being examined. The values of item reliability and segregation are shown in Table 1.3, with item reliability at 0.76 and item separation at 1.78. A value of 0.76 implies that the item is in decent and satisfactory condition, according to the item reliability value [10]. The value of good index separation, according to [23], is greater than 2.0. In contrast, the item separation value is 1.78, in a round value of 2.0, which means good separation against the level of difficulty of the item.

Table 1.3

Item Separation And Reliability Values For The Entire Instrument Construct: A Pilot Study

	Total SCORE	Count	Measure	Model S.E	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
MEAN	165202	44.0	.00	.43	1.01	.03	.92	.00
SEM	.5	.0	.09	.00	.02	.10	.05	.07
P.SD	4.9	.0	.93	.05	.22	.99	.51	.72
S.SD	5.0	.0	.94	.05	.23	1.00	.52	.72
MAX	173.0	44.0	2.26	.66	1.79	2.78	4.43	2.64
MIN	149.0	44.0	-2.53	.44	.61	-2.06	.29	-1.29
REAL RMSE .46 true SD .81 SEPARATON 1.78 Item Reliability .76								
MODEL RMSE .44 TRUE SD .82 SEPARATON 1.78 Item Reliability .76								

According to Table 1.4, the participants' reliability value is 0.96, and the participants' separation value is 4.92. This conclusion implies that the participants' reliability value is extremely high and very good. According to [10], reliability values greater than 0.8 are good and widely recognised. In contrast, the participants' separation value on the item's level of difficulty revealed an excellent separation value. According to [24], a separation value greater than 2.0 is a good value.

Table 1.4

Respondent Separation And Reliability Values For The Entire Instrument Construct: A Pilot Study

	Total SCORE	Count	Measure	Model S.E	INFIT		OUTFIT	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	722.1	190.0	4.57	.32	1.00	.06	.92	-.15
SEM	4.6	.0	.30	.03	.03	.27	.05	.25
P.SD	28.5	.0	1.87	.18	.16	1.64	.28	1.53
S.SD	28.9	.0	1.87	.18	.16	1.66	.29	1.55
MAX	759.0	19.0	8.51	1.01	1.34	3.71	1.53	4.27
MIN	663.0	190.0	1.05	.21	.71	-3.90	.16	-3.58
REAL RMSE	.37	true SD	1.81	SEPARATON	4.92	Item Reliability	.96	
MODEL RMSE	.36	TRUE SD	1.81	SEPARATON	4.99	Item Reliability	.96	

6.2 Item Polarity Through PTMEA CORR

The purpose of using the Value Examination of Point Measure Correlation (PTMEA CORR) value to determine item polarity is to see how well the construct accomplishes its goal. Therefore, the item measures the construct to be assessed if the value recorded on the PTMEA CORR section is positive (+) [10]). However, the designed item does not assess the construct to be measured if the value is negative (-). As a result, the item must be revised or removed since it does not relate to a question (is not targeted) or is challenging for the participants to respond to [25].

According to Table 1.5, all 190 items used had positive values (+), suggesting that the item measured the construct [10, 26]. The results suggest that the positive item goes in one way with the construct, can assess the construct, and does not interfere with the construct being measured. If the PTMEA CORR value is increased, the item can differentiate between participants' abilities.

Table 1.5

Point Measure Correlation Value

Input: 44 Person 190 item Reported : 44 person 190 item 3 Cats Win steps 5.0.2.0

Person: real Sep: 3.23 Rel : .91 item : Real Sep: 1.81 Rel : .77

Itm Statistics: misfit order

Entary number	Total score	Total count	Measure	Model S.E	Out fit		Parameters						
					MNQ	ZSTD	MNQ	ZSTD	Corr	EXP	EXAT OBS%	MAH EXP%	ITEM
48	166	44	-.63	.44	1.20	.92	4.43	2.64	A.39	.50	82.1	81.4	A6.A48 takdir
139	161	44	.27	.41	1.19	.98	2.30	2.01	B.50	.58	64.1	77.5	D1.A139 Patriotik
102	164	44	-.25	.43	1.35	1.59	2.23	1.59	C.39	.54	76.9	78.8	C1.A102 AKhlak Allah
117	156	44	1.06	.40	1.53	2.29	1.92	1.96	D.48	.64	66.7	77.2	C2. A117 Akhlak manusia
109	149	44	2026	.42	1.79	2.75	1.89	1.99	E.49	.69	76.9	79.8	C2. A109 Akhlak manusia
115	15	44	1025	.40	1.68	2.78	1.88	1.94	F.49	.65	64.1	77.4	C2. A115 Akhlak manusia
104	165	44	-.44	.43	.99	.02	1.68	1.02	G.19	.52	89.7	80.2	C1. A104 Akhlak Allah
112	158	44	.76	.40	1.28	.65	1.68	1.45	H.57	.62	71.8	77.4	C2. A112 Akhlak Allah

150	162	44	.10	.41	1.26	1.52	1.68	1.19	I.45	.57	74.4	77.7	D3. P150 Komitmen
140	166	44	-.63	.44	1.12	1.84	1.10	.39	J.39	.50	66.7	81.4	D2. Pa4 Rahsia
151	161	44	.27	.41	1.32	1.35	1.44	.91	K.49	.63	74.4	77.5	D3. P151 Komitmen
165	157	44	.92	.40	1.46	1.25	1.44	1.08	L.54	.58	69.2	77.3	D4. P165 Disiplin
172	161	44	.27	.41	1.28	1.70	1.34	.67	M.48	.46	69.2	77.5	D5. P172 Amamah
101	168	44	-1.05	.47	1.26	-.45	1.20	.64	N.47	.52	87.2	84.0	C1. A101 Aklak Allah
130	165	44	--.044	.43	1.36	1.42	.89	.50	O.43	.50	74.4	80.2	D1. P130 Patriotik
182	166	44	-.63	.44	.87	1.20	.83	.14	P.45	.31	71.8	81.4	D6. P128 Ikhlas
88	173	44	-2.53	.66	1.32	.72	1.26	.28	Q.24	.58	92.3	92.3	C1. P88 Akhlak Allah
88	161	44	.27	.41	1.28	1.22	1.00	.64	R.57	.64	69.2	77.5	D6. A188 Ikhlas
116	156	44	1.09	.40	1.27	1.21	1.25	.14	S.61	.58	76.9	77.2	C2. A116 Akhlak Manusia
145	161	44	.27	.41	1025	.93	1.25	.62	T.53	.64	74.4	77.5	D2. A145 Rahsia
167	156	44	-1.05	.40	1.25	.68	1.08	.72	U.59.53	.60	71.8	77.2	D4. P167 Disiplin
186	160	44	-.44	.41	1.18	1.22	1.18	.31	V.35	.41	66.7	77.5	D6. A186 Ikhlas
45	170	44	-.63	.51	1.13	.85	.65	.51	W.35	.35	82.1	86.6	A6. P45 Takdir
92	172	44	-2.53	.59	1.25	.72	1.24	.04	X.31	.58	87.2	90.1	C1. P92 Aklak Allah
175	161	44	.27	.41	1.24	.73	.91	.60	Y.53	.61	74.4	77.5	D5. P175 Manah
114	159	44	1.09	.40	1.24	1.13	1.08	-.04	Z.59	.56	76.9	77.6	C2. A114 Akhlak Manusia
187	163	44	.43	.42	1.23	1.10	.59	.33	.50	.35	71.8	78.0	D6. A187 Ikhlas
91	172	44	-1.53	.59	1.23	.68	10.8	.33	.32	.35	87.2	90.1	C1. P91 Akhlak Allah
135	162	44	-2.14	.41	1.22	1.10	1.00	.04	.51	.57	64.1	77.7	D1. A135 Patriotik
141	163	44	.27	.42	1.21	1.05	.98	.60	.50	.56	71.1	78.0	D2. P141 Rahsia
125	158	44	.60	.40	1.20	1.00	.53	.21	.61	.62	76.9	77.4	C3. A125 Akhalk Alam
90	171	44	-.08	.55	1.15	.55	.64	.10	.36	.38	84.6	88.2	D1. P128 Patriotik
128	165	44	-2.14	.43	1.10	.50	.76	-.11	.51	.52	74.4	80.2	D1. P128 Patriotik
89	172	44	.10	.59	1.05	.27	.48	-.18	.36	.35	87.2	90.1	C1. P89 Akhlak Allah
93	170	44	.60	.51	1.03	.19	.55	.14	.43	.41	82.1	86.6	C1. P93 Akhlak Allah
129	165	44	-.08	.43	1.03	.21	.80	-.05	.52	.52	79.5	80.2	D1. P129 patriotik
144	162	44	.76	.41	1.02	.16	.78	-.23	.57	.57	79.5	77.7	D2. P144 Rahsia
183	164	44	-1.81	.43	1.01	.11	.73	-.22	.55	.54	76.9	78.8	D6. P183 Ikhlas
163	158	44	-.44	.40	1.00	.05	.77	-.43	.63	.62	71.8	77.4	D4 P163 Disiplin
189	160	44	.43	.41	.95	-.17	.73	-.45	.62	.60	76.9	77.5	D6. A189 Ikhlas
95	169	44	-1.28	.49	.94	-.14	.53	-.21	.47	.44	84.6	85.3	C1. A95 Akhlas Allah
146	163	44	-.08	.42	.94	-.24	.65	-.45	.59	.56	71.8	78.0	D2. A146 Rahsia
100	169	44	-1.08	.49	.91	-.24	.52	-.24	.48	.44	84.6	85.3	C1. A100 Akhlak Allah
133	163	44	-.0.8	.42	.90	-.41	.63	-.49	.59	.56	76.9	78.0	D1. P133 Patriotik
105	161	44	.27	.41	.89	-.51	.75	-.34	.62	.58	79.5	77.5	C2. P105 Akhlak Manusia
152	159	44	.60	.40	.89	-.48	.76	-.41	.64	.61	84.6	77.6	D3. P152 Komitmen
185	166	44	-.63	.44	.89	-.44	.63	-.26	.54	.50	82.1	81.4	D6. P185 IKhlas
110	158	44	.76	.40	.88	-.53	.68	-.69	.66	.62	76.9	77.4	C2. A110 Akhlak Manusia
156	152	44	1.75	.41	.88	-.48	.74	-.65	.70	.67	79.5	78.2	D3. P156 Komitmen
169	157	44	.92	.40	.88	-.53	.66	-.80	.67	.63	74.4	77.3	D4. A169 Disiplin
190	162	44	.10	.41	.88	-.55	.64	-.54	.61	.57	79.5	77.7	D6. A190 Ikhlas
108	156	44	1.09	.41	.87	-.60	.65	-.89	.68	.64	82.1	77.2	C2. P108 Akhlak manusia

158	158	44	.76	.40	.77	-1.19	.86	-.20	.67	.62	82.1	77.4	D3. A158 Komitmen
111	157	44	.92	.40	.85	-.71	.66	-.80	.68	.63	76.9	77.3	C2. A111 Akhlak manusia
103	167	44	-.83	.40	.84	-.64	.68	-.11	.53	.48	79.5	82.6	C1.A103 Akhlak Allah
113	162	44	.10	.46	.84	-.75	.61	-.62	.62	.57	74.4	77.7	C2. A113 Akhlak Manusia
124	164	44	-.25	.41	.83	-.81	.61	-.46	z.59	.54	79.5	78.8	C3. P121 Akhlak Alam
121	166	44	-.63	.43	.82	-.75	.51	-.47	y.57	.50	82.1	81.4	C3. P121 Akhlak Alam
171	161	44	.27	.44	.82	-.87	.70	-.46	x.63	.58	82.1	77.5	D4. A170. Disiplin
106	159	44	.60	.41	.81	-.94	.60	-.87	w.67	.61	84.6	77.6	C2. P106 Akhlak Manusia
122	169	44	-1.28	.40	.81	-.67	.49	-.28	v.50	.44	87.2	85.3	C3. P122 Akhlak alam
119	165	44	-.44	.49	.80	-.90	.59	-.40	u.58	.52	79.5	80.2	C3. P119 Akhlak Alam
131	169	44	-1.28	.43	.80	-.70	.48	-.29	t.50	.44	87.2	85.3	D1. P131 patriotik
179	160	44	.43	.49	.80	-.98	.72	-.48	s.65	.60	82.1	77.5	D5. A179 Amanah
184	167	44	-.83	.41	.80	-.79	.57	-.30	r.54	.48	84.6	82.6	D6. P184 Ikhlas
107	157	44	.92	.46	.79	-1.07	.58	-1.07	q.70	.63	84.6	77.3	C2.P107Akhlak mansia
137	167	44	-.83	.40	.78	-.*92	.64	-.18	p.54	.48	79.5	82.6	D1.A137 Patriotik
157	157	44	.92	.46	.78	-1.13	.61	-.98	o.70	.63	82.1	77.3	D3.A160 Komitmen
160	153	44	1.58	.40	.78	-1.00	.64	-.17	n.72	.63	79.5	77.7	D3.A161 Komiten
161	158	44	.76	.41	.75	-1.30	.65	-.99	m.69	.67	82.1	77.4	D3. A161 Komitmen
162	159	44	.60	.40	.74	-1.34	.53	-.78	l.69	.62	92.3	77.6	D3.A162 Komitmen
174	160	44	.43	.40	.74	-1.40	.53	-1.08	k.68	.61	84.6	77.5	D5. P174 Amanah
96	172	44	-2.14	.59	.73	-.69	.29	-1.01	j.43	.35	79.5	90.1	C1.A96 Akhlak Allah
99	167	44	-.83	.46	.71	-1.26	.43	-.49	i.57	.48	87.2	82.6	C1.A99 Akhlak Allah
98	167	44	-.83	.46	.68	-1.43	.65	-.56	h.56	.48	92.3	82.6	C1. A98 Akhlak Allah
138	167	44	-.83	.46	.68	-1.40	.42	-.17	g.58	.48	87.2	82.6	C1.A98 Akhlak Alah
123	169	44	1.28	.49	.67	1.28	.41	-.57	f.53	.44	94.9	85.3	A123 Akhlak alam
143	158	44	.76	.40	.67	-1.77	.50	-.42	e.71	.62	87.2	77.4	D2.p143 Rahsia
180	159	44	.60	.40	.66	-1.90	.59	-1.29	d.70	.61	89.7	77.6	D5.A180 Amanah
94	167	44	-.83	.46	.65	-1.61	.39	-.91	c.59	.48	92.3	82.6	C1. P94 Akhlak Allah
118	163	44	-.08	.42	.64	-1.98	.42	-1.01	b.66	.56	87.2	78.1	C3. P120 Akhlak Alam
120	164	44	-.25	.43	.61	-2.06	.40	-.96	a.65	.54	92.3	78.8	C3. P120 Akhlak

6.3 Person Polarity Through PTMEA CORR

The comprehensive Rasch model includes an examination of person polarity. Its goal is to determine the amount to which the individual's quality in responding to the item is tested, as well as to verify that the people properly respond to the assessment of the item construct. In addition, it is to identify person patterns that are different from the ideal pattern. The person polarity acceptance measure is the same as the item polarity.

According to [9]), a person whose Point Measure Correlation is negative shows an unusual decision. This issue requires further attention to the demographic characteristics that may contribute to such behaviour. This is since the Rasch model can detect invariance in the measurement in the equation, implying that there must be discrepancies.

In the analysis context of this pilot study, the researchers found that all 44 respondents were within the values of the three acceptance criteria, as shown in Table 1.6 below. It is explained further in the polarity of the person in Table 1.6.

Table 1.6

Person Polarity

Input: 44 Person 190 item Reported : 44 person 190 item 3 Cats Win steps 5.0.2.0

Person: real Sep: 3.23 Rel : .91 item : Real Sep: 1.81 Rel : .77

Itm Statistics: misfit order

Entary number	Total score	Total count	Measure	Model S.E	Out fit		Parameters						
					MNQ	ZSTD	MNQ	ZSTD	Corr	EXP	EXAT OBS	MAH EXP	ITEM
37	711	190	3.71	.21	1.28	3.15	1.53	4.27	A.51	.59	57.0	66.1	R 37 LE BA DQ SP AA
10	758	190	7.80	.72	.94	.13	1.41	-.70	B..12	.11	98.1	98.1	R 10 PE B A DA SP AA
16	690	190	2.77	.22	1.34	3.10	1.30	2.14	C.67	.72	54.2	71.5	R 16 LE K A DA SP AC
12	714	190	3.85	.24	1.30	3.71	1.30	2.46	D.50	.57	47.7	66.3	R 12 PE B A LA ST AD
21	678	190	2.13	.21	1.23	1.58	1.29	1.46	E.76	.80	71.0	78.0	R 21 LE B A DA SP AB
17	705	190	3.45	.21	1.20	2.46	1.24	2.19	F.58	.63	54.2	66.7	R 17 LE B A DA SP AD
41	700	190	3.23	.34	1.12	1.39	1.19	1.75	G.63	.66	61.7	67.8	R 41 LE K A UD SP AC
14	750	190	6.06	.25	1.18	.75	1.14	.46	H.24	.26	91.6	90.6	R 41 LE K P DA IJ AC
20	738	190	5.06	.25	1.04	.30	1.18	.77	I.36	.38	79.4	79.8	R 20 LE B A DA SP AA
15	737	190	5.00	.43	1.17	1.25	.99	.04	J.38	.39	84.1	79.8	R 15 LE K P DA IJ AD
24	754	190	6.64	.22	1.07	.32	1.14	.42	K.17	.20	94.4	79.0	R 24 LE K A DA SP AB
36	687	190	2.62	.26	1.13	1.20	1.14	.98	L.72	.74	67.3	94.4	R 36 LE B A DA SP AA
4	740	190	5.20	.21	.97	-.14	1.13	.57	M.36	.36	81.3	72.9	R 4 LE K P UD IJ AA
8	703	190	3.36	.36	1.13	1.57	1.13	1.23	N.62	.64	66.4	81.6	R 8 PE K A UD ST AE
2	751	190	6.18	.23	1.07	.35	.90	-.08	O.23	.24	91.6	67.1	R 2 LE K A LA SP AC
6	730	190	4.61	.32	1.07	.72	1.00	-.07	P.43	.45	72.9	91.6	R 6 LE K A UD SP AD
28	748	190	5.84	.72	1.05	.30	.91	-.11	Q.27	.28	88.8	73.3	R 6 LE K A UD SP AD
7	758	190	7.80	.25	1.02	.25	.88	.18	R.11	.11	98.1	88.8	R 28 LE K A DA SP AC
26	738	190	5.06	.22	1.00	.02	.85	-.58	S.39	.38	77.6	98.1	R 7 LE K A UD SP AB
32	723	190	5.06	.72	.99	-.09	.90	-.67	T.51	.50	67.3	79.8	R 26 LE K A DA SP AB
3	758	190	7.80	.26	.98	.19	.46	-.44	S.13	.11	98.1	68.9	R 32 PE K A DA SP AA

18	741	190	5.26	.23	.98	-.10	.94	-.14	r.36	.35	83.2	98.1	R 3 PE K P LA SP AB
40	730	190	4.61	.21	.96	-.41	.83	-.93	q.46	.45	74.8	82.4	R 18 LE K A DA SP AB
23	702	190	3.32	.43	.95	-.66	.91	-.89	p.66	.65	71.0	73.3	R 40 LE K A US SP AA
25	754	190	6.64	.21	.95	-.01	.67	-.46	o.22	.20	94.0	67.4	R 23 LE L A DA SP AC
27	708	190	3.58	.30	.94	-.83	.94	-.51	n.62	.61	73.8	94.4	R 25 LE K A DA SP AA
19	756	190	5.66	.47	.93	-.32	.70	-.88	m.33	.30	87.9	66.3	R 27 LE B A DA SP AC
29	755	190	6.84	1.01	.93	-.04	.45	-.89	l.22	.18	95.3	86.2	R 19 PE L A DA SP AC
11	759	190	8.51	.21	.91	.23	.16	-1.42	k.12	.08	99.1	95.3	R 29 LE B A DA SP AA
31	712	190	3.76	.23	.91	-1.28	.85	-1.24	j.60	.58	66.4	99.1	R 11 PE K A DA AA
39	730	190	4.61	.31	.91	-.88	.78	-.74	i.48	.45	74.8	66.1	R 31 PE K ADA SP AA
43	747	190	5.75	.27	.90	-.41	.72	-.91	h.32	.29	88.8	73.3	R 39 LE K A UD SP AA
5	670	190	1.62	.30	.86	-.83	.78	-.76	g.86	.84	86.9	87.8	R 43 LE K P UD IJ AD
13	663	190	1.05	.27	.81	-1.33	.77	-1.71	f.90	.88	89.6	83.3	R 5 LE K P UD ST AE
1	669	190	1.5	.25	.77	-1.55	.61	-1.32	e.88	.85	87.9	87.8	R 13 LE B A DA SP AA
22	676	190	2.01	.21	.77	-.165	.73	-1.43	d.84	.81	86.0	79.4	R 22 LE K A DA SP AB
34	700	190	3.23	.21	.72	-3.72	.67	-3.50	c.72	.66	82.2	67.8	R 34 PE B A DA SP AC
35	702	190	3.32	.21	.72	-3.90	.68	-3.50	b.71	.65	84.1	67.4	R 35 LE K A DA ST AA
9	726	190	4.40	.22	.71	-3.53	.60	-2.93	a.55	.48	8302	70.5	R P PE K A DA SP AC

6.4 Principal Component Analysis

The attribute of unidimensionality is crucial in Rasch analysis when identifying instruments that assess in one direction and one side. Instruments that have a tendency to assess what should be evaluated ambiguously might cause inaccurate outcomes. Therefore, a minimum of 20 percent (20%) Raw Variance Explained By Measures is required by Rasch analysis as an indication of a decent unidimensionality instrument, with a value of 40 percent (40%) as an indication of better measurement and a maximum of 60 percent (60%) as an indication of satisfactory. In comparison, the greatest Unexplained Variance in The 1st Contrast should not surpass the 15 percent (15%) value control limit. Table 1.7 demonstrates that 190 items are in the target value, which is the value of Raw Variance Explained By Measures (39.2%) and the value of Unexplained Variance in The 1st Contrast of 7.2% in this pilot analysis.

Table 1.7

In the 1st contrast, Raw Variance Explained by Measures vs Unexplained Variance

Input: 44 person 190 item Reported: 44 person 190 item 3 cast winsteps 5. 0. 2.0

Table of standardized Residual variance in Eigen value unit = item information unit

	Eigen value	Observed		Expected
Total raw variance in observations	175.9880	100%		100.0%
Raw variance explained by measure	68.9880	39.2%		39.6%
Raw variance explained by persons	40.9711	23.3%		23.5%
Raw variance explained by item	28.0168	15.9%		16.1%

Raw unexplained variance (total)	107.000	60.8%	100.0%	60.4%
Unexplained variance in 1st contrast	12.7366	7.2%	11.9%	
Unexplained variance in 2nd contrast	11.1486	6.3%	10.4%	
Unexplained variance in 3rd contrast	9.4246	5.4%	8.8%	
Unexplained variance in 4th contrast	6.4198	3.6%	6.0%	
Unexplained variance in 5th contrast	6.0221	3.4%	5.6%	

6.5 Item Fit

The infit value of MNSQ and outfit MNSQ show how well items fit in measuring constructs. The outfit values of MNSQ and infit MNSQ, as per [10], should be in the range of 0.7 to 1.3. Moreover, Linacre (2005) states that the recognised index or range is between 0.5 and 1.5. [27] and [9] also claimed that it is a duplicate. This is to verify that the items created can be used to measure constructs. Nonetheless, instead of infit, the MNSQ outfit index should be used to evaluate the fitting of items that measure a construct or hidden factor. If the MNSQ value exceeds 1.5 logits, it indicates a perplexing item. In contrast, if the MNSQ value is lower than 0.5 logit, it implies the participant expects the item to behave rapidly [24]. Additionally, the outfit values of ZSTD and infit ZSTD should be in the range of -2 to +2 (Bond & Fox, 2007). Nevertheless, the ZSTD index can be omitted, provided that the outfit values and infit MNSQ are approved [24].

As a result, if this criterion is not satisfied, the item may be subjected to abortion or purification. In addition, the misfit order is displayed for all 190 items having MNSQ values within the defined range values as a consequence of statistical item analysis of misfit order.

6.6 Measurement of Standardised Residual Correlations

The goal of measuring standardised residual correlation values is to see if there are any redundant items. The strong residual correlation between the two items suggests that they are not independent, perhaps since they have comparable characteristics or since they both incorporate a number of other dimensions that are common.

For example, [24]states that if the correlation value of the two items is more than 0.70, it signals a strong correlation value, and only one item should be kept while the other should be deleted. He went on to say that one of the items has to be discarded in order to build a decent and excellent instrument. Item selection relates to the MNSQ value, which will be kept near as 1.00 as possible (Linacre, 2010). There are 20 pairs of redundant items in this pilot study, as shown in Table 1.8, since the correlation value of items surpasses the value of 0.70, which is between items D6184/D6185, D4165/D4167, C2115/C2117, D4170/D4171, C2106/C2107, C3119/C3120, C192 /C193, D5176/D5177, D4164/D4165, D5179/D5180, C3123/D1138, D4166/D5168, D5177/D5179, C188/C193, C194/C199, C3123/D1131, A6462/A645/C2148 and D4164/D4168.

Table 1.8

Largest Standardized Residual Correlation on items

Input: 44 person 190 item Reported: 44 person 190 item 3 cast win steps 5. 0. 2.0 Largest ST5ANDARIZED RESIDUAL CORRELATION USED TO IDENTITY DEPENDENT ITEM		
Correlation	**Entry number item**	**Entry number item**
.87	184 D6.P184 IKHLAS	185 D6. P185 Ikhlas
.84	165 D4. P165 Discipline	167 D4. P167 Disiplin
.82	115 C2. A115 Akhlak manusia	117 C2. A117 Akhlak manusia
.82	170 D4. A170 Disiplin	171 D4. A171 Disiplin
.81	106 C 2 .p106 Akhlak manusia	107 C2. P107 Akhlak Manusia
.79	119 C3. P119 Akhlak alam	120 C3. P 120 Akhlak Alam
.78	92 C1. P92 Akhlak allah	93 C1. P93 Akhlak Allah
.76	176 D5. P176 Amanah	177 D5. A177 Amanah
.76	164. D4. P164 Disiplin	165 D4. p165 Disiplin
.75	179 D5. A179 Amanah	180 D5. A180 Amanah
.75	123 C3. A123 Akhlak Alam	138 D1. A138 Patriotik
.75	166 D4. P166 Disiplin	168 D4. P168 Disiplin
.74	177 D5. A177 Amanah	179 D5. A179 Amanah
.74	88 C1. P88 Akhlak Allah	93 C1. P93 Akhlak Allah
.74	94 C1.p94 Akhlak Allah	99 C1. A99 Akhlak Allah
.73	123 C3. A123 Akhlak Alam	131 D1. P131 Patriotik
.73	46 A6 . p46 Takdir	47 A6. P47 Takdir
.72	92 C1. P92 Akhlak Allah	100 C1. A100 Akhlak Allah
.72	145 D2 . A145 Rahsia	148 D2. A148 Rahsia
.72	164 D4. P164 Disiplin	168 D4. P168 Disiplin

However, although there were 20 overlapping items in this pilot study, the researcher accepted them in the context of the study because of as many as 15 overlapping items in the range value of 0.70, measuring different items statements. Similarly, there are five overlapping items that exceed 0.80. However, the researcher accepted these overlapping items in the context of the study because they are in different evaluation dimensions and different item statements.

7. DISCUSSION

Following the analysis of the data, each item was evaluated in accordance with the standard index and the requirements that must be met in order for the instrument to meet the Rasch model's criterion of validity and reliability. The elimination and refining of items are done in consideration of and with professional opinions and assessments in mind. Note that ten items do not fulfil the standards of the analysis that has been defined, according to the outcomes of the pilot study, which should be removed. Table 1.9 below provides an overview of the pertinent question items.

Table 1.9

Summary of Items Dropped and Retained

Dimension	Contact	Number of Original Items	Accepted Item	Number of Accepted Item	Drop Items	Number of Drop Items
1. Appreciation of the Faith	Against Allah	10	A1.1, A1.2, A1.3, A1.4, A1.5, A1.6, A1.7, A1.8, A1.9 & A1.10	10	0	0
	Against Angels	4	A2.11, A2.12, A2.13, & A2.14	4	0	0
	Against the Messengers	10	A3.15, A3.16, A3.17, A3.18, A3.19, A3.20, A3.21, A3.22, A3.23 & A3.24	10	0	0
	Against al-Quran	11	A4.25, A4.26, A4.27, A4.28, A4.29, A4.30, A4.31, A4.32, A4.33, A4.34 & A4.35	11	0	0
	Against the Hereafter	9	A5.36, A5.37, A5.38, A5.39, A5.40, A5.41, A5.42, A5.43 & A5.44	9	0	0
	Allah's Provisions	8	A6.45, A6.48, A6.49 & A6.50	4	A6.46, A6.47, A6.51 & A6.52	4
2. Appreciation of Worship	Tawhidic	7	B1.53, B1.54, B1.57 & B1.59	4	B1.55, B1.56 & B1.58	3
	Prayer	10	B2.60, B2.61 B2.62, B2.63, B2.64, B2.65, B2.66, B2.67, B2.68 & B2.69	10	0	0
	Fasting	9	B3.70, B3.71, B3.73, B3.74, B3.75, B3.76, B3.77 & B3.78	8	B3.72	1
	Donation	9	B4.79, B4.80 B4.81, B4.82, B4.83, B4.84, B4.85, B4.86 & B4.87	9	0	0
	Pilgrimage	8	B5.88, B5.89 B5.90, B5.91, B5.92, B5.93, B5.94 & B5.95	8	0	0
3. Appreciation of Morals	Allah Relations	17	C1.96, C1.97, C1.98, C1.99, C1.100, C1.101, C1.102, C1.103, C1.104, C1.105, C1.106, C1.107, C1.108, C1.109, C1.110, C1.111 & C1.112	17	0	0
	Human Relations	15	C2.113, C2.114, C2.116, C2117, C2118, C2.119, C2.120, C2.121, C2.122, C2.123, C2.124, C2.125 & C2.126	13	C2.115 & C2.127	2
	Environment Relation	10	C3.128, C3.129, C3.130, C3.131, C3.132, C3.133, C3.134, C3.135, C3.136 & C3.137	10	0	0

4. Islamic appreciation of MAF Pledge Allegiance	Patriotic	14	D1.138, D1.140, D1.142, D1.143, D1.144, D1.145, D1.146, D1.147, D1.148, D1.149, D1.150 & D1.151	12	D1.139 & D1.141	2
	Confidentiality	10	D2.152, D2.153, D2.154, D2.155, D2.156, D2.157, D2.158, D2.159, D2.160 & D2.161	10	0	0
	Commitment	14	D3.162, D3.163, D3.164, D3.165, D3.166, D3.167, D3.168, D3.169, D3.171, D3.172, D3.173, D3.174 & D3.175	13	D3.170	1
	Discipline	10	D4.176, D4.177, D4.178, D4.179, D4.180, D4.181, D4.182, D4.183 & D4.184	9	D4.185	1
	Trusty	11	D5.186, D5.187, D5.188, D5.189, D5.190, D5.191, D5.192, D4.193, D5.194 & D5.196	10	D5.195	1
	Sincerely	9	D6.197, D6.198, D6.199, D6.200, D6.201, D6.202, D6.203, D6.204 & D6.205	9	0	0
Items Amount		**205**		**190**		**15**

Validity and reliability are key concerns when establishing a novel instrument for research, according to the findings of this pilot analysis. Therefore, ten items were deleted based on the findings of the analysis since their validity and reliability were doubted.

As a result, it is considered that this instrument is of adequate quality for usage by the Muslim army in Malaysia, relying on its validity and reliability. The implications of this analysis aid researchers in developing spiritual assessment instruments for Malaysian Muslims (MMSA-i) based on the four assessment dimensions. This is the first step toward ensuring that spiritual assessment can be used consistently and assisting the MAF and Malaysian Ministry of Defense in providing superior national defence human resources in terms of material and spiritual resources.

8. CONTRIBUTIONS TO THE STUDY

This research is a pilot study. It is carried out to ensure that the instrument is consistent and to fix any issues that may arise during the pilot study [28]), as well as to offer a consistent, systematic, reliable, and validated instrument for the actual study ([4]. A novel input in the construction and validation of present instruments is the Rasch model, which is a mix of Classical Measure Theory (CMT) and Item Response Theory (IRT). The two measurement theories are a complementary relationship to meet the psychometric characteristics of a stable instrument for use in real studies in constructing the spiritual profile of MAF. This instrument contributes to the measurement of intangible aspects of MAFs. In addition, it adds value to existing measuring tools in MAFs in assessing the material aspects of MAF strength known as Situational Force Scoring (SFS).

9. RECOMMENDATIONS FOR FUTURE RESEARCH

The researcher proposed the focus of future studies in order to further broaden the backing of the concept of consistent and systematic item development by using the Rasch Measurement Model. Meanwhile, the respondents were non-muslim military personnel who were more into the internal aspects that touched on the fighting spirit and morale. This is in view of the strength of the MAF, which also comprises non-muslims by 13% . This strength also contributes to the sustainability of the country's defence and security.

10. CONCLUSION

A pilot study on MMSA-i containing four dimensions, 20 constructs and 190 items was conducted on the respondents of Muslim MAF selected by the researcher. This was performed via a sampling method aimed at involving 44 Muslim military personnel in the zone that dominates the MAF force population, which is the main central zone of peninsular Malaysia. It covers the strength of 3 services in MAF, namely, 30 RMA respondents, 5 RMN respondents and 9 RMAF respondents. Analysis of the Rasch model proves that MMSA-i is acceptable and has high reliability (person = 0.96; item = 0.76) as well as a Cronbach Alpha value of 0.98. Separation is also at a good value and accepted (person = 4.92; item = 1.78). Both (item and person) contributed to the measurement in terms of the aspect of item and person polarity since all PTMEA CORR values were positive between +0.5 and +1.5 logit. The item suitability test showed that the value of the MNSQ infit/ outfit range was between +0.5 logit to +1.5 logit.

The final outcomes of the Principal Component Analysis (PCA) revealed that 190 of the items utilised were within the targeted value, notably, the value of Raw Variance Explained By Measures 39.2% and the value of Unexplained Variance in The 1st Contrast 7.2%, indicating that the items did not have any uncertainty in measuring what should be assessed and did not produce inaccurate results. On the other hand, the results of Standardised Residual Correlations (SRC) showed that there were 20 overlapping items. Still, researchers accepted all overlapping items in the context of the study because of as many as 15 overlapping items in the range value of 0.70, which measures different item statements. Similarly, there are five overlapping items that exceed 0.80, namely C296/C297, C398/D2112 and C398/D1105. Nevertheless, the scholar accepts this redundant item since it measures various dimensions and constructs of evaluation as well as separate item assertions in the context of this research.

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