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Measuring Cyberbullying Levels among Adolescents in Integrated Islamic Junior High Schools in Jambi City: An Implementation of the Rasch Model

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Abstract

The incidence of cyberbullying in adolescents is increasing. This is, in part, attributed to the progress of Science and Technology (IPTEK), which is inseparable from the negative impact of cyberbullying. The latter has become central to adolescent communication. Consequently, cyberbullying, especially among adolescents, demands serious attention for early intervention. The purpose of this study was to measure the level of cyberbullying among students at SMP IT Jambi City by implementing the Rasch Model, a modern theoretical approach enhancing the accuracy of measuring latent variables. The research included 91 students from classes VII and VIII, selected through proportional random sampling. Data collection employed the Cyber Victim and Bullying Scale (CVBS) with 28 questions. The Rasch Model analysis revealed a high level of cyberbullying among adolescents at SMP IT Jambi City, with 52.2% categorized as high and 47.8% as low. The results demonstrated high accuracy, evident in validity and reliability coefficients of 0.87 and 0.71, respectively. This research provides valuable information for stakeholders aiming to maintain a cyberbullying-free climate.

Keywords: Adolescents, measurement, cyberbullying, Rasch model

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Introduction

The advent of electronic communication technologies, such as social networking services, instant messaging, chat rooms, and text messaging, has transformed how teenagers interact with each other (Holfeld, 2014). Approximately one-third of global Internet users fall within the age group of children and adolescents under 18 years old (UNICEF, 2017). Although digital technology introduces new forms of interpersonal communication (Thomas, et al, 2015), the Internet Era has unveiled a darker side: young people are susceptible to cyberbullying, where they may become victims or perpetrators in the online realm (Baldry, et al, 2015).

Despite the numerous benefits, this technology increases the vulnerability of teenagers to cyberbullying. Cyberbullying encompasses intentional and repetitive bullying behaviors carried out online, including social media, email, chat rooms, short message services, websites, and multimedia uploads via various electronic devices (Ferrara, et al, 2018). According to Smith et al. (2008), cyberbullying involves deliberate attacks within an electronic context, characterized by an imbalance of power between the aggressor and the victim. The prevalence of cyberbullying victimization ranges from 10% to 40% (Zhang et al., 2022; Kowalski et al., 2014), with associated evidence linking cyberbullying violence to emotional problems in adolescents (Gamez-Guadix et al., 2013; Hamm et al., 2015).

Following Olweus' definition, cyberbullying is typically understood as bullying carried out through electronic media (Olweus, 1993; Dooley, et al, 2009). Specifically, cyberbullying among children and adolescents involves intentional and repeated harm occurring in cyberspace through the use of computers, smartphones, and other electronic devices (Smith et al., 2008; Jadambaa et al., 2019). Recent years have witnessed the emergence of new cyberbullying behaviors, such as cyberstalking and online dating abuse (Pereira & Matos, 2016; Gradinger, 2018). In Indonesia, UNICEF data indicate that 92% of the most active internet users are children aged 12-17, with 212,400 users in Jambi City according to APJII data.

Various studies report cyberbullying prevalence ranging from 6.5% to 35.4% in Europe and the United States, with factors influencing the variation. Adolescents experiencing cyberbullying exhibit symptoms like low self-esteem, reduced empathy, social and psychological adjustment issues, depression, anxiety, anger, low academic achievement, and school absenteeism (Pengpid & Peltzer, 2019). Long-term impacts on victims include high levels of anger, anxiety, sadness, shame, loneliness, and embarrassment (Bitar et al., 2023; Nguyen et al., 2023), negatively affecting coping mechanisms, emotional well-being, and self-esteem (Ak et al., 2015; Egan & Todorov, 2009).

Beyond psychological consequences like low self-esteem, anxiety, and depression (Kutok et al., 2021; Fiddiana & Priyambodo, 2022; Del et al., 2016; Fitriana, 2018), cyberbullying poses greater risks than traditional bullying (; O'brien & Albrecht, 1992; Aboujaoude et al., 2015). High school students aged 15 to 19 experiencing cyberbullying show decreased mental health, including antisocial behavior, stress, and depression (Reed et al., 2018, Cassidy, et al, 2013). The consequences extend to reduced academic achievement, anxiety, and violent behavior (Agley et al., 2021), impacting cognitive abilities and overall student development.

A preliminary study at an Integrated Islamic Junior High School in Jambi City revealed that out of 10 teenagers, 7 had experienced cyberbullying via platforms like Instagram and WhatsApp. Interviews with these teenagers uncovered instances of depression leading to school avoidance and the adoption of a mask to hide from the cyberbullying perpetrator. Additionally, 4 out of 7 teenagers admitted to being afraid to meet friends at school due to embarrassment, while 2 out of 7 felt worthless because of social media teasing. Surprisingly, all 7 teenagers chose not to share their experiences with teachers, opting to keep it to themselves.

Measuring cyberbullying is crucial globally, with Indonesia experiencing an escalating need due to increased social media usage. According to the Coordinating Minister for Human Development and Culture, 45% of children in Indonesia have encountered digital or virtual bullying. Despite several attempts to measure cyberbullying in Indonesia, existing scales may fall short, lacking coverage of all cyberbullying forms or accurately gauging severity (Chun et al., 2020). Hence, this research aimed to refine existing scales and provide a more precise and comprehensive understanding by employing the Rasch model for measuring cyberbullying levels. The Rasch Model, rooted in modern test theory, addresses classical test theory limitations and enhances measurement accuracy (Rasch, 1960; Sumintono, 2015; Falani, 2022). The implementation of the Rasch model seeks to offer more informative insights into the extent and impact of cyberbullying.

Method

Participants

The respondents in this study were early adolescents aged 12-15 years in grades VII and VIII, totaling 91 participants. The study took place at Uswatun Hasanah Islamic Junior High School in Jambi City, where informed consent was obtained from participants prior to their involvement.

Measurement

The level of adolescent cyberbullying in this study was assessed using the Rasch Model, a measurement approach rooted in modern test theory known to enhance the accuracy of measuring latent variables (Rasch, 1960; Falani, 2022).

Procedure

The research utilized the Cyber Victim and Bullying Scale (CVBS), comprising 28 questions. Ethical approval for this study was granted by the Health Research Ethics Commission of the Faculty of Medicine and Health Sciences, Jambi University, with the ethical number 2137/UN21.8/PT.01.04/2023.

Data Analysis

The analysis employed in this research was the Rasch Model, chosen for its ability to improve the precision of measuring latent variables in the context of adolescent cyberbullying.

Result

Respondent's Demographic Characteristics

The demographic characteristics of respondents in this study can be seen in the following table.

Table 1

Respondent's Demographic Characteristics

Variable	Amount
Age	Mean = 12.62 SD = 0.61
Gender	
• Man	38 (42%)
• Woman	53 (58%)
Social media	
• WA	84
• Telegram	2
• TikTok	9
• Instagram	34
• Facebook	24
• Discord	3
• Pinterest	2

In Table 1, the characteristics of the respondents in this study are reviewed from several aspects including age, gender, and social media used. The average age of respondents was 12.62 years with a standard deviation of 0.61. Regarding gender, the respondents in this study were dominated by women. Based on social media use, WhatsApp (WA) is the most widely used platform with 84 respondents. Followed by Instagram with 34 respondents, Facebook with 24 respondents, and TikTok with 9 respondents. Meanwhile, Telegram, Discord, and Pinterest were used by 2, 3, and 2 respondents respectively.

Dimensionality Test Results

The results of the dimensionality test using Winstep software are presented in the following table,

Table 2

Dimensionality

	Item information units	
	Eigenvalues	Observed
Total raw variance in observations	36.3679	100.0%
Raw variance explained by measures	9.3679	25.8%
Raw variance explained by persons	1.8475	5.1%
Raw Variance explained by items	7.5204	20.7%
Raw unexplained variance (total)	27,0000	74.2%
Unexplained variance in 1st contrast	2.8526	7.8%

The dimensionality test in the Rasch model is used to investigate the assumption that the measurement instrument used measures one dimension or construct (Keliat. et al, 2023; Falani et al, 2022). If an instrument is considered "unidimensional," then the total score can be used as a valid measure of the construct being measured. From the analysis results, the raw variance explained by measures value is 25.8%. The eigenvalue of unexplained variance in first contrast is quite small (2.85) with an observed percentage value of 7.8%.

Item Fit

In the Rasch model, "item fit" refers to the degree to which the empirical data fits the Rasch model. In a practical context, item fit analysis helps in identifying items that may not perform as expected in a particular test context. For example, if an item shows poor fit (e.g., has a fit statistic that is much greater or smaller than 1), this may indicate that the item is not measuring the same construct as other items in the test, or that the item may be confounding or misleading for respondents (Smith et al. 2008). The following table 3 are the results of the Item Fit analysis of research instruments using Winstep software.

In the Rasch model, item fit criteria can be determined based on several statistics, including Outfit Mean Square (MNSQ) and Outfit Z-standard (ZSTD). The accepted Outfit MNSQ value is usually in the range of 0.5 to 1.5, indicating the extent to which an individual's response pattern fits the model. Similarly, accepted Outfit ZSTD values typically fall within the range of -2.0 to +2.0, reflecting the extent to which an individual's response pattern fits the model, accounting for the number of respondents. Additionally, Point Measure Correlation values, which show the correlation between item scores and total scores, are generally accepted in the range of 0.4 to 0.852 (Falani et al., 2022; Sumintono, 2015). Based on the table above, it can be observed that all items meet at least one of the three criteria mentioned.

Table 3

Item Fit Summary

Entry No	Total Score	Total Count	Measure	Model S.E	INFIT		OUTFITS		PTMEASURED		Items
					MNSQ	ZSTD	MNSQ	ZSTD	CORR	EXP	
22	110	91	-1.07	.25	1.40	1.4	1.81	2.0	.43	.53	22
1	112	91	-1.19	.24	1.52	1.8	1.77	2.0	.46	.55	1
7	132	91	-2.11	.19	1.52	2.3	1.69	2.5	.56	.69	7
11	107	91	-.86	.27	1.41	1.4	1.09	.4	.46	.50	11
21	100	91	-.20	.35	1.40	1.1	1.14	.4	.36	.40	21
2	99	91	-.07	.37	1.38	1.0	1.31	.7	.33	.38	2
25	95	91	.68	.51	1.25	.6	.55	-.4	.31	.28	25
9	120	91	-1.62	.22	1.13	.6	.97	.0	.61	.61	9
10	113	91	-1.25	.24	.95	-.1	1.13	.5	.55	.56	10
27	104	91	-.62	.30	1.03	.2	.58	1.0	.50	.46	27
13	110	91	-1.07	.25	1.02	.2	.93	-.1	.53	.53	13
16	100	91	-.20	.35	1.00	.1	.80	-.2	.41	.40	16
5	94	91	.98	.59	.97	.2	.93	.2	.24	.24	5
18	101	91	-.32	.34	.87	-.3	.60	-.8	.47	.41	18
26	94	91	.98	.59	.82	-.1	.46	-.4	.31	.24	26
8	92	91	2.11	.01	.81	.1	.14	-.6	.25	.14	8
23	97	91	.25	.42	.81	-.3	.52	-.7	.39	.33	23
20	95	91	.68	.51	.80	-.2	.76	-.1	.32	.28	20
6	95	91	.68	.51	.78	-.3	.72	-.1	.33	.28	6
15	98	91	.08	.40	.77	-.5	.70	-.4	.41	.36	15
19	98	91	.08	.40	.75	-.5	.60	-.6	.42	.36	19
28	94	90	.65	.52	.75	-.4	.40	-.7	.37	.28	28
12	93	91	1.40	.72	.74	-.2	.19	-.7	.32	.20	12
14	95	91	.68	.51	.74	-.4	.38	-.8	.37	.28	14
17	98	91	.08	.40	.72	-.6	.42	1.0	.45	.36	17
3	94	91	.98	.59	.68	-.4	.21	1.0	.38	.24	3
24	97	91	.25	.42	.61	-.9	.32	1.2	.47	.33	24

Reliability Test Results

Reliability in the Rasch model refers to the consistency of measurement. If you measure the same thing with the same test at different times, the results should be consistent. In other words, if the test is reliable, then an individual should get the same or nearly the same score every time they take the test, as long as what is measured does not change (Smith et al. 2008). Reliability in the

Rasch Model is assessed through two indicators: person reliability and item reliability. The following are the results of the reliability test using Winstep software.

Table 4
Summary of Person Reliability Test

	Total Score	Count	Measure	Model S.E	Infit MNSQ	Infit ZSTD	Outfits MNSQ	Outfits ZSTD
Mean	33.2	28.0	-3.34	.62	1.10	.3	.78	.0
P. SD	4.9	.1	1.03	.25	.43	.8	.42	.6
S. Elementary	4.9	.1	1.04	.25	.44	.8	.42	.6
Max.	53.0	28.0	-.87	1.02	2.37	3.0	1.86	1.7
Min.	29.0	27.0	-4.68	.26	.49	-1.4	.17	-1.1
Real RMSE .72 True SD .74 Separation 1.03 Item Reliability .51								
Model RMSE .67 True SD .78 Separation 1.17 Item Reliability .58								
SE of Item Mean=.14								

Table 5
Item Reliability Test Summary

	Total Score	Count	Measure	Model S.E	Infit MNSQ	Infit ZSTD	Outfits MNSQ	Outfits ZSTD
Mean	101.4	91.0	.00	.43	.99	.2	.78	-.1
P. SD	9.3	.2	.97	.18	.28	.8	.46	.9
S. Elementary	9.5	.2	.99	.18	.28	.8	.47	.9
Max.	132.0	91.0	2.11	1.01	1.52	2.3	1.81	2.5
Min.	92.0	91.0	2.11	.19	.61	-.9	.14	-1.2
Real RMSE .47 True SD .85 Separation 1.79 Item Reliability .76								
Model RMSE .46 True SD .85 Separation 1.85 Item Reliability .77								
SE of Item Mean=.19								

Tables 4 and 5 display the reliability values for items and persons as 0.51 and 0.76, respectively. These values indicate that the reliability falls within the 'good' category. Therefore, this value suggests that the item will consistently provide the same measurement value for various respondents (Abdullah et al., 2012).

Cyberbullying Level Measurement Results

Following this analysis, the results of measuring the level of cyberbullying using the Rasch Model are presented in the descriptive statistics below.

Table 6

Descriptive Summary Statistics

Parameter	Value
Mean	-4.38428571
Standard Error	0.157283653
Median	-4.68
Mode	-5.91
Standard Deviation	1.500390425
Sample Variance	2.251171429
Kurtosis	-1.14218778
Skewness	0.428619148
Range	5.04
Minimum	-5.91
Maximum	-0.87
Sum	-398.97
Count	91
Largest(1)	-0.87
Smallest(1)	-5.91

Based on data from 91 respondents, the average level of cyberbullying is -4.38 with a standard deviation of 1.50. This value indicates variation in the data. The median value of the data is -4.68, which means that half of the respondents had a score below this and half had a score above this. The mode value in the data is -5.91, which means that this is the value that occurs most frequently in the data. The range of values in the data is 5.04, with a minimum value of -5.91 and a maximum value of -0.87. A skewness value of 0.43 indicates that the data distribution is slightly skewed to the right. Meanwhile, the kurtosis value of -1.14 indicates that the data distribution is flatter than the normal distribution. Overall, these results provide an overview of the level of cyberbullying among respondents as measured by the Rasch Model. Furthermore, the results of measuring the level *of cyberbullying* by implementing the Rasch Model are presented in the following table.

Person Measure

In the Rasch model, the “Person Measure” is the logit value of a respondent. This value is obtained from Rasch model analysis and reflects the ability or latent trait possessed by the individual. This "Person Measure" value can be used to compare respondents' levels of cyberbullying (Falani et al, 2022). The following are the results of person measure analysis in the Rasch Model using Winstep

Table 7

Person Measure Order

Entry No	Total Score	Total Count	Measure	Model S.E	INFIT MNSQ	INFIT ZSTD	OUTFITS MNSQ	OUTFITS ZSTD	PTMEASURED CORR	PTMEASURED EXP	Person
75	53	28	-.87	.26	.67	-1.3	.94	-.1	.40	.60	75
51	44	28	-1.54	.29	.86	-.4	1.00	.1	.53	.53	51
79	43	28	-1.63	.30	.68	-1.0	.96	.0	.43	.52	79
59	41	28	-1.82	.32	1.28	.9	1.29	.8	.50	.50	59
88	41	28	-1.82	.32	1.66	1.8	1.21	.6	.46	.50	88
35	40	28	-1.93	.33	2.37	3.0	1.86	1.7	.26	.48	35
10	39	28	-2.04	.34	1.55	1.4	1.18	.5	.45	.47	10
17	38	28	-2.16	.35	1.59	1.5	1.17	.5	.36	.45	17
74	37	28	-2.28	.37	.99	.1	1.18	.5	.26	.44	74
2	36	28	-2.43	.39	.49	-1.4	.44	1.1	.61	.42	02
9	36	28	-2.43	.39	1.76	1.7	1.29	.7	.28	.42	09
23	36	28	-2.43	.39	1.15	.5	1.19	.5	.36	.42	23
46	36	28	-2.43	.39	.98	.1	1.07	.3	.27	.42	46
48	36	28	-2.43	.39	.65	-.9	.56	-.8	.55	.42	48
55	36	28	-2.43	.39	.65	-.9	.56	-.8	.55	.42	55
69	36	28	-2.43	.39	.60	-1.0	.98	.1	.45	.42	69
77	36	28	-2.43	.39	1.07	.3	1.01	.2	.35	.42	77
81	36	28	-2.43	.39	1.92	1.9	1.27	.7	.31	.42	81
87	34	27	-2.57	.41	.92	.0	1.01	.2	.31	.40	87
72	35	28	-2.58	.41	.63	-.9	.51	-.9	.57	.40	72
65	32	28	-3.22	.52	1.49	1.0	.69	-.2	.42	.32	65
68	32	28	-3.22	.52	1.07	.3	.70	-.2	.41	.32	68
71	32	28	-3.22	.52	1.03	.2	.50	-.5	.46	.32	71
11	31	28	-3.53	.60	.88	.0	1.53	.8	.17	.28	11
18	31	28	-3.53	.60	1.15	.4	.40	-.6	.44	.28	18
19	31	28	-3.53	.60	.76	-.2	.36	-.7	.44	.28	19
47	31	28	-3.53	.60	.86	.0	.73	.0	.32	.28	47
49	31	28	-3.53	.60	.97	.2	1.58	.9	.19	.28	49
63	31	28	-3.53	.60	.79	-.2	.40	-.6	.42	.28	63
64	31	28	-3.53	.60	.76	-.2	.36	-.7	.44	.28	64
67	31	28	-3.53	.60	1.63	1.1	.94	.2	.24	.28	67
83	31	28	-3.53	.60	1.27	.6	1.21	.5	.30	.28	83
6	30	28	-3.96	.73	1.53	.9	.38	-.4	.38	.23	06
13	30	28	-3.96	.73	1.53	.9	.38	-.4	.38	.23	13
27	30	28	-3.96	.73	1.96	1.3	.95	.3	.22	.23	27
41	30	28	-3.96	.73	.78	-.1	.69	.1	.31	.23	41
42	30	28	-3.96	.73	1.96	1.3	.95	.3	.22	.23	42

Entry No	Total Score	Total Count	Measure	Model S.E	INFIT		OUTFITS		PTMEASURED		Person
					MNSQ	ZSTD	MNSQ	ZSTD	CORR	EXP	
50	30	28	-3.96	.73	1.53	.9	.38	-.4	.38	.23	50
54	30	28	-3.96	.73	.68	-.2	.28	-.6	.44	.23	54
70	30	28	-3.96	.73	.70	-.2	.32	-.5	.42	.23	70
76	30	28	-3.96	.73	1.10	.4	1.23	.6	.08	.23	76
80	30	28	-3.96	.73	1.99	1.3	1.07	.4	.20	.23	80
1	29	28	-4.68	.02	.97	.3	.53	.1	.20	.17	01
4	29	28	-4.68	.02	.95	.3	.44	.0	.23	.17	04
5	29	28	-4.68	.02	.97	.3	.53	.1	.20	.17	05
29	29	28	-4.68	.02	.96	.3	.46	.0	.22	.17	29
32	29	28	-4.68	.02	.97	.3	.53	.1	.20	.17	32
36	29	28	-4.68	.02	1.00	.3	.65	.2	.17	.17	36
39	29	28	-4.68	.02	.74	.1	.17	-.5	.38	.17	39
62	29	28	-4.68	.02	.88	.2	.30	-.2	.29	.17	62
84	29	28	-4.68	.02	.74	.1	.17	-.5	.38	.17	84
85	29	28	-4.68	.02	1.06	.4	1.46	.8	.03	.17	85
89	29	28	-4.68	.02	.74	.1	.17	-.5	.38	.17	89
91	29	28	-4.68	.02	.74	.1	.17	-.5	.38	.17	91
3	28	28	-5.91	.84	Minimum Measure				.00	.00	03
7	28	28	-5.91	.84	Minimum Measure				.00	.00	07
8	28	28	-5.91	.84	Minimum Measure				.00	.00	08
12	28	28	-5.91	.84	Minimum Measure				.00	.00	12
14	28	28	-5.91	.84	Minimum Measure				.00	.00	14
15	28	28	-5.91	.84	Minimum Measure				.00	.00	15
16	28	28	-5.91	.84	Minimum Measure				.00	.00	16
20	28	28	-5.91	.84	Minimum Measure				.00	.00	20
21	28	28	-5.91	.84	Minimum Measure				.00	.00	21
22	28	28	-5.91	.84	Minimum Measure				.00	.00	22
24	28	28	-5.91	.84	Minimum Measure				.00	.00	24
25	28	28	-5.91	.84	Minimum Measure				.00	.00	25
26	28	28	-5.91	.84	Minimum Measure				.00	.00	26
28	28	28	-5.91	.84	Minimum Measure				.00	.00	28
30	28	28	-5.91	.84	Minimum Measure				.00	.00	30
31	28	28	-5.91	.84	Minimum Measure				.00	.00	31
33	28	28	-5.91	.84	Minimum Measure				.00	.00	33
34	28	28	-5.91	.84	Minimum Measure				.00	.00	34
37	28	28	-5.91	.84	Minimum Measure				.00	.00	37
38	28	28	-5.91	.84	Minimum Measure				.00	.00	38
40	28	28	-5.91	.84	Minimum Measure				.00	.00	40
43	28	28	-5.91	.84	Minimum Measure				.00	.00	43
44	28	28	-5.91	.84	Minimum Measure				.00	.00	44
45	28	28	-5.91	.84	Minimum Measure				.00	.00	45
52	28	28	-5.91	.84	Minimum Measure				.00	.00	52
53	28	28	-5.91	.84	Minimum Measure				.00	.00	53
56	28	28	-5.91	.84	Minimum Measure				.00	.00	56
57	28	28	-5.91	.84	Minimum Measure				.00	.00	57
58	28	28	-5.91	.84	Minimum Measure				.00	.00	58
60	28	28	-5.91	.84	Minimum Measure				.00	.00	60
61	28	28	-5.91	.84	Minimum Measure				.00	.00	61
66	28	28	-5.91	.84	Minimum Measure				.00	.00	66

Entry No	Total Score	Total Count	Measure	Model S.E	INFIT MNSQ	INFIT ZSTD	OUTFITS MNSQ	OUTFITS ZSTD	PTMEASURED CORR	PTMEASURED EXP	Person
73	28	28	-5.91	.84	Minimum Measure				.00	.00	73
78	28	28	-5.91	.84	Minimum Measure				.00	.00	78
82	28	28	-5.91	.84	Minimum Measure				.00	.00	82
86	28	28	-5.91	.84	Minimum Measure				.00	.00	86
90	28	28	-5.91	.84	Minimum Measure				.00	.00	80

The table above presents the results of measuring cyberbullying levels for 91 research respondents. The cyberbullying level for each respondent is shown in the measures column. The table has been automatically sorted by Winstep, starting with the highest level of cyberbullying (-0.87 logit) and ending with the lowest (-5.91 logit). This arrangement facilitates researchers in assessing the cyberbullying levels of respondents.

Discussion

Measuring the level of cyberbullying in the 91 respondents resulted in two categories, according to the separation value in the person measure order table, namely 1.03. These two categories include Low Cyberbullying and High Cyberbullying (Bond and Fox, 2013).

This measurement meets the unidimensional assumptions required by the Rasch model (Sumintono & Widhiarso, 2014; Andrich & Marais, 2019). In the dimensionality table, it can be seen that the Raw variance explained by measures value is 25.8%, meeting the minimum unidimensional requirements of 20%. Additionally, according to Mardapi (2016), there are two main criteria for the quality of test instruments: validity and reliability. The results of the instrument validity test also show that the instrument used meets the requirements for instrument validity, as indicated by the test results for the level of item suitability. Furthermore, the instrument also meets the reliability criteria of 0.76 in the high category (Brennan, 2000).

Measuring students' levels of cyberbullying using the Rasch Model approach produces more accurate measurements and provides a wealth of information (Bond and Fox, 2013; Falani et al., 2020; Supriyati et al., 2021; Falani et al., 2022). This is because measurement using the Rasch model employs a modern test theory approach, considered capable of overcoming the weaknesses in classical test theory measurements (Wright & Mok, 2004). Based on the results of measuring the level of cyberbullying, it can be seen that the measurements can sort respondents' cyberbullying levels in more detail using a logit ruler. This is different from measurements with classical test theory, which cannot achieve this.

However, this measurement becomes the same as the classical test theory approach in cases where respondents get a minimum measurement score, meaning that when all respondents receive a minimum score for all items, in this case, the Rasch Model becomes less sensitive (Rasch, 1960).

Conclusion

The implementation of the Rasch Model in measuring the level of *cyberbullying* among adolescents in integrated Islamic junior high schools produces more accurate measurements compared to measurements using the classical test theory approach. This allows researchers to see more information from the measurements of the level of *cyberbullying* carried out. However, this measurement becomes less sensitive in the case of a minimum measurement, which means that all respondents get a minimum score on an item. The measurements carried out will be the same as the classical test theory approach.

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References

Aboujaoude, E., Savage, M.W., Starcevic, V., Salame, W.O. (2015). Cyberbullying: Review of an old problem gone viral. *J. Adolesc. Health*, *57*, 10–18. doi: 10.1016/j.jadohealth.2015.04.011

Agley, J.; Jun, M., Eldridge, L., Agley, D.L., Xiao, Y., Sussman, S., Golzarri-Arroyo, L., Dickinson, S.L., Jayawardene, W., & Gassman, R. (2021). Effects of ACT Out! social issue theater on social-emotional competence and bullying in youth and adolescents: Cluster randomized controlled trial. *JMIR Ment. Health*, *8*. doi: 10.2196/25860

Ak, Ş., Özdemir, Y., & Kuzucu, Y. (2015). Cyber- victimization and cyberbullying: The mediat- ing role of anger, don't anger me! *Computers in Human Behavior, 49,* 437–443. doi: 10.1016/j.chb.2015.03.030

Andrich, D., & Marais, I. (2019). A course in Rasch measurement theory. *Measuring in the educational, social, and health sciences*, 41-53. doi: 10.1007/978-981-13-7496-8

Baldry AC, Farrington DP, Sorrentino A. (2015). Am I at risk of cyberbullying? A narrative review and conceptual framework for research on the risk of cyberbullying and cyber victimization: the risk and needs assessment approach. *Aggress Violent Behav,* 23, 36–51. doi: 10.1016/j.avb.2015.05.014

Bitar, Z., Elias, M. B., Malaeb, D., Hallit, S., & Obeid, S. (2023). Is cyberbullying perpetration associated with anxiety, depression and sui- cidal ideation among Lebanese adolescents? Results from a cross-sectional study. *BMC Psychology, 11*(1), 53. doi: 10.1186/s40359-023-01091-9

Bond, T.G., & Fox, C.M. (2013). *Applying the Rasch model: Fundamental measurement in the human sciences*. Psychology Press.

Brennan, R.L. (2000). Performance assessments from the perspective of generalizability theory. *Applied Psychological Measurement*, *24*(4), 339-353. doi: 10.1177/01466210022031796

Cassidy, W.; Faucher, C.; Jackson, M. (2013). Cyberbullying among Youth: A Comprehensive Review of Current International Research and Its Implications and Application to Policy and Practice. *Sch. Psychol. Int*, *34*, 575–612. doi: 10.1177/0143034313479697

Chun, J., Lee, J., Kim, J., & Lee, S. (2020). An international systematic review of cyberbullying measurements, Computers in Human Behavior. 113. doi: 10.1016/j.chb.2020.106485

Del Rey, R., Casas, J. A., & Ortega, R. (2016). Impact of the ConRed program on different cyberbullying roles. Aggressive Behavior, 42, 123–135. doi: 10.1002/ab.21608

Dooley JJ, Pyzalski J, Cross D. (2009). Cyberbullying versus face-to-face bullying: a theoretical and conceptual review. J Psychol. 217, 182–8. doi: 10.1027/0044-3409.217.4.182

Egan, L. A., & Todorov, N. (2009). Forgiveness as a coping strategy to allow school students to deal with the effects of being bullied: Theo- retical and empirical discussion. *Journal of Social and Clinical Psychology, 28*(2), 198–222. doi: 10.1521/jscp.2009.28.2.198

Falani, I., Akbar, M., & Naga, DS (2020). The Precision of Students' Ability Estimation on Combinations of Item Response Theory Models. *International Journal of Instruction*, *13*(4), 545-558. doi: 10.29333/iji.2020.13434a

Falani, I., Iriyadi, D., Ice, YW, Susanti, H., & Nasuition, RA (2022). A Rasch Analysis of Perceived Stigma of COVID-19 among Nurses in Indonesia Questionnaire. Psychological Thought, 15(1), 12. doi: 10.37708/psyct.v15i1.530

Fiddiana, N.; Priyambodo, A.B. (2022). The Correlation Between Self-Control and Cyberbullying at Private High School X in Bogor. *KnE Soc. Sc*, 7, 255–266. doi: 10.18502/kss.v7i1.10216

Fitriana, NS. (2018). Positive Thinking Training to Reduce Public Speaking Anxiety in Students (Doctoral dissertation, Mercu Buana University Yogyakarta).

Ferrara P, Ianniello F, Villani A, Corsello G. Cyberbullying a modern form of bullying: let's talk about this health and social problem. Ital J Pediatr. 2018;44(1):14. doi:10.1186/s13052-018-0446-4 doi: 10.1186/s13052-018-0446-4

Gámez-Guadix, M., Orue, I., Smith, P. K., & Calvete, E. (2013). Longitudinal and reciprocal relations of cyberbullying with depression, substance use, and problematic internet use among adolescents. *Journal of adolescent health*, *53*(4), 446-452. Doi: 10.1016/j.jadohealth.2013.03.030

Gradinger, P., Yanagida, T., Strohmeier, D., & Spiel, C. (2015). Prevention of cyberbullying and cybervictimization: Evaluation of the ViSC Social Competence Program. Journal of School Violence, 14(1), 87–110. doi: 10.1080/15388220.2014.963231

Hamm, M. P., Newton, A. S., Chisholm, A., Shulhan, J., Milne, A., Sundar, P., ... & Hartling, L. (2015). Prevalence and effect of cyberbullying on children and young people: A scoping review of social media studies. *JAMA pediatrics*, *169*(8), 770-777. Doi: 10.1001/jamapediatrics.2015.0944

Holfeld, B. (2014). Perceptions and attributions of bystanders to cyber bullying. *Computers in Human Behavior*, *38*, 1-7. doi: 10.1016/j.chb.2014.05.012

Jadambaa A, Thomas HJ, Scott JG, Graves N, Brain D, Pacella R. (2019). Prevalence of traditional bullying and cyberbullying among children and adolescents in Australia: a systematic review and meta-analysis. Aust NZJ Psychiatry. 53, 878–88. doi: 10.1177/0004867419846393

Keliat, B. A., Nasution, R. A., Handini, I. T., & Falani, I. (2023). Psychometric properties evaluation of the Indonesian version of the Beck Scale for Suicide Ideation (BSSI) questionnaire using a Rasch model. *European Review for Medical & Pharmacological Sciences*, *27*(21).

Kowalski, R. M., Giumetti, G. W., Schroeder, A. N., & Lattanner, M. R. (2014). Bullying in the digital age: a critical review and meta-analysis of cyberbullying research among youth. *Psychological bulletin*, *140*(4), 1073. Doi: 10.1037/a0035618

Kutok, E.R. Dunsiger, S. Patena, J.V. Nugent, N.R. Riese, A. Rosen, R.K & Ranney, M.L. (2021). A Cyberbullying Media-Based Prevention Intervention for Adolescents on Instagram: Pilot Randomized Controlled Trial. *JMIR Ment. Health*, *8*. doi: 10.2196/26029

Mardapi, D. (2012). Educational measurement, assessment, and evaluation. *Yogyakarta: Nuha Medika , 45* .

Nguyen, T. H., Shah, G., Muzamil, M., Ikhile, O., Ayangunna, E., & Kaur, R. (2023). As- sociation of in-school and electronic bully- ing with suicidality and feelings of hopeless- ness among adolescents in the United States. *Children (Basel, Switzerland), 10*(4), 755. doi: 10.3390/children10040755 PMID:37190004

Olweus D. Bullying at School: What We Know and What We Can Do. Oxford; Cambridge, MA: Blackwell (1993).

O'Brien, E. J., & Albrecht, J. E. (1992). Comprehension strategies in the development of a mental model. *Journal of experimental psychology*: learning, memory, and cognition, 18(4), 777. doi: 10.1037//0278-7393.18.4.777

Pengpid, S. Peltzer, K. Bullying victimization and externalizing and internalizing symptoms among in-school adolescents from five ASEAN countries. Child. Youth Serv. Rev. 2019, 106, 104473 doi: 10.1016/j.childyouth.2019.104473

Pereira F, Matos M. Cyber-stalking victimization: what predicts fear among Portuguese adolescents? Eur J Crim Policy Res. (2016) 22:253–70. doi: 10.1007/s10610-015-9285-7

Rasch, G. (1960). Probabilistic models for some intelligence and attainment tests. Danish Institute for Educational Research.

Reed LA, Ward LM, Tolman RM, Lippman JR, Seabrook RC. The association between stereotypical gender and dating beliefs and digital dating abuse perpetration in adolescent dating relationships. *J Interpers Violence*. (2018). doi: 10.1177/0886260518801933

Smith PK, Mahdavi J, Carvalho M, Fisher S, Russell S, Tippett N. Cyberbullying: its nature and impact in secondary school pupils. *J Child Psychol Psychiatry*. (2008) 49:376–85. doi: 10.1111/j.1469-7610.2007.01846.x

Smith, A. B., Rush, R., Fallowfield, L. J., Velikova, G., & Sharpe, M. (2008). Rasch fit statistics and sample size considerations for polytomous data. *BMC medical research methodology*, *8*, 1-11. doi: 10.1186/1471-2288-8-33

Sumintono, B. (2015). Rasch modeling in educational assessment: An introduction.

Supriyati, Y., Falani, I., & Maulana, S. (2021, March). The information function of mixed-format test of physics learning outcomes measurement. In *AIP Conference Proceedings* 2320(1). doi: 10.1063/5.0037574

Thomas HJ, Connor JP, Scott JG. (2015). Integrating traditional bullying and cyberbullying: challenges of definition and measurement in adolescents - a review. Educ Psychol Rev. 27, 135–52. doi: 10.1007/s10648-014-9261-7

UNICEF ed. Children in a Digital World. New York, NY: UNICEF (2017).

Wright, B.D., & Mok, M. G.N. (2004). Introduction to Rasch measurement. MESA Press.

Zhang W, Huang S, Lam L, Evans R and Zhu C. (2022). Cyberbullying definitions and measurements in children and adolescents: Summarizing 20 years of global efforts. *Front. Public Health* 10:1000504. doi: 10.3389/fpubh.2022.1000504