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Materialism as Personality: Psychometric Properties Using the Rasch Model

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Abstract. Research on the instrument of materialism as a personality in Indonesia is still lacking. The purpose of this study is to determine the psychometric properties using Rasch model on materialistic personality scale. This study was conducted on 505 diploma/undergraduate/post graduate students aged 18-25 years old using accidental sampling technique. Data analysis used the Rasch model which is supported by Winstep software. The results showed there were 16 items that fit with the Rasch model, rating scale functioned appropriately, reliability (item=0.99, person=0.55, Cronbach's Alpha=0.61). The analysis results also showed that there were three items that were gender biased, and very high accuracy of measurement information would be obtained at the moderate materialistic personality level. The implication of this study is that the 16 items materialistic personality scale can be used to measure materialistic personality.

Keywords: materialism; psychometric properties; Rasch Model

Materialism is the result of a philosophical study that developed from the underlying reality of human existence. Moser and Trout (2005) explained that materialism, as a philosophical ideology, is considered a general perspective of something that actually exists materially or physically. Seligman (1901) stated that in order for the next generations of humans to survive, they needed to produce and reproduce the material requirements of everyday life.

In today's modern era, materialism is related to individual finances that assumes that everything require material. Individuals believe that success is judged by wealth, social status, and one's welfare. Aisyahrani et al. (2020) explained that the existence of materialism is caused by internal and external factors. Self-satisfaction and life goals are categorized as internal factors because individuals are satisfied with the acquisition of property, social status, and appropate self-image. On the other hand, social environment and social media are categorized as external factors that tend to influence individual behavior. Recognition of social status derived from personal wealth will have an impact on materialism which will be difficult to separate from the individual.

Materialism has both positive and negative impacts. First and foremost, it can contribute to life satisfaction because materialism can increase economic motivation and lead to increased future satisfaction with one's standard of living (Sirgy et al., 2019). However, on the other hand, materialism can also influence individual compulsive buying habits (Eren et al., 2012; Islam et al., 2017; Moulding

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et al., 2017; Sharif & Khanekharab, 2017; Villardefrancos & Otero-L'opez, 2016). The tendency to compulsively buy is due to addiction that stems from the belief that purchasing material goods will make you happy (Eren et al., 2012). It can also be considered as a substitute for identity (Claes et al., 2016). In addition, Pradhan et al. (2018) also emphasized that materialism affects the use of credit cards and increases the tendency to buy impulsively, which then triggers compulsive buying habits.

Furthermore, materialism has been shown to have an impact on individual well-being. Gatersleben et al. (2018) mentioned that a sustainable lifestyle is characterized by higher well-being, higher environmental concern and behavior, and lower materialism. Nevertheless, Aisyahrani et al. (2020) added that materialism can also have a negative relationship with well-being, even though individuals believe that materialism can help them achieve life goals. She conveyed that the growing materialism in individuals may manifest as a hedonic lifestyle and corruption.

The problematic side of materialism has an impact on various aspects of an individual's social, spiritual and educational life. In social life, Umiarso and Rijal (2019) demonstrated that a materialist lifestyle is rapidly developing through waves of advertisements on various social media. This may cause individuals to hoard all goods without considering their actual needs. In addition to that, excessive consumerism may encourage individuals to ignore religious and legal values in order to obtain their desired goods. Husna (2015) explained that materialism in the world of education have influenced most students to acquire the mindset that the main goal after completing their studies is to work in order to gain financial success. This way of thinking is also supported by the rise of university advertisements which gave away the idea that graduates will get jobs quickly if they apply to certain campuses. These current trends are considered neglectful as they fail to endorse other important aspects in life, for example, students who have completed college can also become members of a community, find meaning in life, and build ethical identity and integrity.

In Indonesia, there are three major theories about materialism that are used as research measurement tools, namely materialism as a personality (Ger & Belk, 1996), materialism as a personal value or moral consequence (Richins & Dawson, 1992) and materialism as a life aspiration (Kasser, 2002). The three measuring instruments are used in accordance with the context of the materialism studied. However, research on materialism as a personality is still very rare, even though it has been known that materialistic personality is a problem that needs to be studied further.

There are several studies that examined materialism in Indonesia. It is necessary to study the psychometric properties of materialism measurement tools as future research may require them for further analysis. This research is a follow-up collaborative research on measuring instruments of materialism in Indonesia. This study examines one of the measuring tools for materialism, namely materialistic personality. Previously, Puri and Hidayat (2020) had conducted research on the divergence of measuring instruments for materialism as personality and materialism as values. Saffana and Hidayat (2020) also conducted a study on the divergence of measuring instruments for materialism as values and materialism as life aspirations.

The measurement tool for materialism as a personality that is commonly used in research is the instrument by Belk (1984) and Belk (1985) which was updated by Ger and Belk (1996) in the

following years. The validity of the updated instrument was then tested on a sample of students and for interrelationships with other materialism measurement instruments (Seneca, 2006). Judging from the findings of previous research, the researchers of this study assume that the instrument developed by Ger and Belk (1996) can function well in the sample group of students in line with the findings of a study conducted by Seneca (2006).

Belk (1985) described materialism as a consumer orientation that is strongly attached to worldly possessions. At a higher level, individuals will perceive ownership as the main thing that is believed to be the greatest source of both satisfaction and dissatisfaction. Various recent studies have found that materialism does not only focus on the study of consumer behavior, but also on samples with special characteristics, such as students or college students. One study found that students who have high materialism tend to have low academic engagement and achievement (King & Datu, 2017). Furthermore, other studies have found that college students overall tend to have high materialism which, as demonstrated by research, could cause them to have poor academic achievement (Kazuzuru, 2020).

Based on said findings, validation of materialistic personality measurement instruments on student samples is needed. This is what underlies previous studies to validate materialism measurement instruments on student samples see (Seneca, 2006). Belk initially revealed that materialism can be measured using three sub-personalities, namely possessiveness, non-generosity, and envy (Belk, 1985). Ger and Belk (1996) then added a personality aspect seen evident in materialism, namely preservation. Belk (1985) explains that materialism consists of four aspects, namely a) possessiveness, which is the tendency to control ownership. Possessiveness is conceptualized in value-free terms (like any other trait that is measured) and can potentially be associated positively or negatively with human satisfaction. b) non-generosity, which is the reluctance to share property with others, reluctance to lend or donate property to others, and negative attitude towards charity. c) envy, which is the displeasure of seeing the superiority or strengths of others (for example: happiness, success, reputation, etc). d) preservation, which involves the conservation of events, experiences, and memories in material/real form (Ger & Belk, 1996). It is these indicators that are measured in measuring materialistic personality.

At present, the materialistic personality scale has been adapted into Indonesian by Husna and Hidayat (Puri & Hidayat, 2020). In terms of the methodology used, the psychometric properties and internal structure of this scale have also been studied by Puri and Hidayat (2020) using Classical Test Theory. In addition, previous studies outside Indonesia have also reported the psychometric properties of this instrument using the confirmatory factor analysis method eg, (Seneca, 2006)). However, based on a review of the existing literature, there has been no research in either Indonesia or other countries that examines the psychometric properties of materialistic personality scales using modern test theory approaches such as the IRT or the Rasch model, though it has been well known that the development of modern test theory was carried out to overcome the limitations of Classical Test Theory (Hayat et al., 2021).

The Rasch model (Wolins, 1982) is one of the modern test theory approaches that has contributed

greatly to research in the field of psychology (Aryadoust et al., 2019). With the application of the Rasch model, psychometric property testing will produce more in-depth item analysis results when compared to the classical approach (Hayat et al., 2021). In addition, the Rasch model can produce linear measurement results between respondents and items so that the interrelationships between the two can be compared directly with each other (Andrich, 1978; Sumintono & Widhiarso, 2014). Furthermore, the application of the Rasch model allows testing item functioning (DIF; Differential Item Functioning) between different groups such as gender which is not possible in the classical approach.

Aside from that, based on a literature review, a significant number of studies have found gender differences in materialism, such as a study conducted on a sample of Americans which found that there were differences in the level of materialism between men and women (Segal & Podoshen, 2013). Another study in Pakistan (Umar et al., 2016) along with a recent study on a sample of Americans both found evidence that showed differences in the level of materialism between men and women (Keech et al., 2020).

Based on the findings of these three studies, the DIF test based on gender differences can be carried out using the Rasch model approach eg, (Temel et al., 2022). DIF-gender testing will provide a different perspective to examine whether the differences that occur are no longer at the level of mean differences, but instead are at the item level (Cho et al., 2016). This analysis certainly has novelty in the study of gender differences in measuring materialistic personality. With the finding that the contribution and usefulness of the Rasch model in psychometric property testing studies as well as the DIF test of materialism measuring instruments is still very limited, this study will fill this methodological gap. Therefore, this study aims to test the psychometric properties of the materialistic personality scale by applying the Rasch model and to test the functioning of items between different genders in the Indonesian sample.

Method

Participants

The participants in this study were students from diploma, undergraduate and post graduate degree, aged 18-25 years. Research participants were selected using a non-probability sampling approach. The subjects in this study were 505 students (22.97% males, 77.03% females) from various state/private universities in Indonesia.

Table 1
Description of Participants

	Education Level			Total	%
	Diploma	Bachelor	Master		
Sex					
Male	23	81	12	116	22.97
Female	26	317	46	389	77.03
Total	49	398	58	505	100
Ethnics					
Bugis	18	183	26	227	44.95
Jawa	18	64	19	101	20.00
Makassar	3	72	1	76	15.05
Others	10	79	12	101	20
Total	49	398	58	505	100

Research Instrument

The research instrument used is a materialistic personality measure developed by Belk (1985) and updated by Ger and Belk (1996). As quoted from Puri and Hidayat (2020), this scale has been adapted to Indonesian in an unpublished study conducted by (Husna, 2015). This scale was previously used by Puri and Hidayat (2020) in a study of the divergence of materialistic personality measuring instruments with Cronbach's Alpha of 0.705. The scale consists of 21 statement items which are divided into four aspects, namely possessiveness, non-generosity, envy and preservation. This scale has response options with five alternative answers, namely: very appropriate, appropriate, neutral, inappropriate, and very inappropriate.

Procedure and Research Ethic

This research has obtained research ethics approval from the Research Ethics Committee of the Faculty of Psychology, Universitas Gadjah Mada, Number: 4172/UN1/FPSi.1.3/SD/PT.01.04/2020. Research data collection was carried out from September 16 to October 12, 2020 using a Google form. The number of subjects who filled out the questionnaire was 516 students. Before the data were analyzed, the researchers performed data cleaning using Microsoft Excel software. Data cleaning was carried out without involving respondents who had constant response sets, which is a form of measurement disturbance in Rasch's analysis (Karabatsos, 2000). Thus, the amount of data analyzed to the next stage was 505 students as respondents.

Rasch Analysis

Because the response options for all items on the measuring instrument in this study are in the form of a Likert scale, the parameterization of the Rasch Model that can be used is the Rating Scale Model (RSM) (Andrich, 1978). In RSM, category thresholds on the Likert scale (threshold) are included in the item estimation process. Threshold is the transition point of a person's response from one category to an adjacent category on the Likert scale. The number of thresholds is equal to the number of categories

(k) minus 1. RSM is used to estimate the probability that someone will choose a particular response category in the resulting rating scale when the "level of materialism" of respondents and the parameters of the items are known. The RSM formula is (Linacre & Wright, 2012):

$log(P_{nik} \mid P_{(k-1)})$= B_n-D_i-F_k

P_{nik} is the probability that the person who answers item i will choose option k, whereas P_{k1} is the probability that the nth person will choose the $k-1$ category, B_n is the level of trait on the construct measure or the level of materialism of the 'n' teh person, D_i is the level of difficulty (item location) item i and F_k is the probability that category k will be selected that depends on category $k-1$. Estimated item difficulty level (D_i) and the level of materialism of the respondents (B_n) are expressed on a logit scale (Linacre, 2010). In this study, each item has five ordinal scale response options. With these four options, there are four thresholds, namely the 2 to 1 option, the 3 to 2 option, the 4 to 3 option, and the 5 to 4 option.

Furthermore, in the application of RSM, there are three assumptions that need to be met, namely: unidimensionality, local independence and parallel item characteristic curves (Mair, 2018). In addition, there are other assumptions, namely that there is no Differential Item Functioning (DIF), which means that items function the same way between different subgroups (Mesbah & Kreiner, 2013). The four assumptions will be tested in this study.

Procedure for Data Analysis

Rasch Modeling analysis was performed on the 21 item materialistic personality scale. Winsteps software version 3.73 (Linacre & Wright, 2012) was used to perform analysis with RSM (Linacre & Wright, 2012). The estimation method used is unconditional maximum likelihood (UCON). Before the RSM analysis was carried out, a descriptive analysis was first carried out to obtain information about the mean item score, SD for each item, skewness and kurtosis. Descriptive analysis was performed using IBM SPSS version 22.

Results

Descriptive Statistics

Table 2 contains information about the mean, SD, skewness, and kurtosis for all items on the materialistic personality scale. The results of item analysis show that all items have a skewness value in the range of -2 to 2, which means that the item does not experience a serious violation of normality (Muthen & Kaplan, 1992). There is one item that has skewness > 1 (item A13) which is included in the moderately skewed category, but the use of analysis that determines each item on an ordinal scale (eg, RSM) can overcome this skewed.

Table 2
Description of Subjects

	Items	Mean (*SD*)	Skewness	Kurtosis
A1	*Saya marah jika ada sesuatu yang dicuri dari saya, sekalipun sesuatu itu harganya tidak seberapa*	3.79 (1.082)	-.708	-.230
A2	*Saya merasa tidak nyaman membiarkan orang lain di rumah/kamar saya ketika saya tidak ada di sana*	3.54 (1.205)	-.370	-.903
A3	*Saya tidak terlalu bersedih ketika kehilangan sesuatu.**	3.34 (1.052)	-.129	-.651
A4	*Dibanding teman-teman, saya termasuk yang tidak terlalu peduli dengan keamanan barang-barang milik saya.**	3.84 (1.145)	-.729	-.474
A5	*Saya senang menyumbang untuk kegiatan amal.**	1.88 (.789)	.582	.045
A6	*Saya senang berbagi dengan orang lain apa pun yang saya miliki.**	2.04 (.833)	.389	-.229
A7	*Saya jarang berdonasi dalam pengumpulan dana untuk mereka yang mengalami musibah.*	2.27 (.979)	.501	-.085
A8	*Saya tidak suka meminjamkan barang milik saya, sekalipun untuk teman baik.*	1.89 (.932)	.931	.504
A9	*Saya merasa bangga ketika ada teman yang lebih berprestasi dibanding saya.**	2.49 (.928)	.396	.146
A10	*Saya senang menerima tamu menginap di rumah saya.**	2.45 (.999)	.355	-.264
A11	*Saya merasa iri ketika ada teman yang bisa memiliki apa yang tidak mampu saya beli.*	2.21 (1.074)	.615	-.330
A12	*Saya khawatir ada orang yang akan mengambil barang-barang milik saya.*	3.04 (1.072)	-.135	-.572
A13	*Tidak masalah bagi saya untuk memberi tumpangan bagi mereka yang tidak memiliki kendaraan.**	1.76 (.842)	1.447	2.968
A14	*Saya tidak mampu meraih apa yang seharusnya bisa saya capai.*	2.39 (1.030)	.429	-.355
A15	*Orang kaya biasanya merasa tidak pantas bergaul dengan orang-orang biasa.*	2.03 (1.084)	.796	-.169
A16	*Setiap kali membeli hadiah untuk orang yang saya kasihi, saya juga membeli sesuatu untuk diri saya sendiri.*	3.07 (1.084)	-.101	-.584
A17	*Saya iri pada orang-orang bisa membeli apapun yang mereka inginkan.*	2.42 (1.217)	.572	-.604
A18	*Terkadang saya ingin menjadi orang lain yang hidupnya lebih sukses dari saya sendiri.*	3.13 (1.228)	-.273	-.874
A19	*Saya suka mengoleksi berbagai benda.*	3.04 (1.152)	-.011	-.806
A20	*Saya mengumpulkan banyak souvenir.*	2.55 (1.131)	.394	-.586
A21	*Saya tetap menyimpan benda-benda yang seharusnya sudah saya buang.*	3.31 (1.130)	-.293	-.644

Unidimensionality

Misbach and Sumintono (2014) argued that unidimensionality is an important aspect for measuring what should be measured. Unidimensionality in Rasch modeling uses Principal Component Analysis on Residuals

(PCAR) (Smith, 2002) which measures the diversity of the instrument. Linacre and Wright (2012) explained that the requirement for unidimensionality is if the raw variance measurement results are >30%. In addition, the ideal unexplained variance value <15% (Sumintono & Widhiarso, 2014). The results of measuring raw variance data on the materialistic personality scale are 9.2 eigenvalues or 36.6%. The test results show that the unidimensionality requirements on the materialistic personality scale have been fulfilled.This is also supported by the five unexplained variance instruments (8.5%, 6.5%, 5.3%, 5.2%, 4.4%) which ideally does not exceed 15%.

Local Independence

The application of RSM in this study is based on the second assumption, namely local independence. Mair (2018) explains that local independence requires that the response given by the respondent to one item does not depend on the response it gives to other items. The assumption of local independence in this study was tested using the Q3 statistic (Yen, 1984), which if the raw residual correlation > 0.30 indicates a violation of local independence (Christensen et al., 2016; Nair et al., 2011; Roe et al., 2014). The results of the analysis show that there are four pairs of items that experience local dependence, namely A3 and A4 (r = 0.33), A5 and A6 (r = 0.47), A11 and A17 (r = 0.44), and A19 and A20 (r = 0.58). Then, items A3, A6, A17 and A20 were deleted and then re-analyzed. The results of the analysis of the remaining 17 items show that all items are free from local dependence.

Item Fit Statistics

Infit mean-square (mnsq), outfit mean-square (mnsq), and point measure correlation (PTMEA) values are statistics used to detect whether items fit the model. Items that do not fit the model will be reported and marked for consideration in future studies. The perfect mnsq infit and outfit values are 1, whereas values in the range of 0.5 – 1.5 indicate that the items fit the model (Boone et al., 2014). In addition to the mnsq infit and outfit, the PTMEA correlation is also used to determine whether the items fit the model. In principle, the PTMEA correlation is the same as the point-biserial correlation coefficient in classical theory. The PTMEA value > 0.20 indicates that the items function well to distinguish respondents with high trait levels and respondents with low trait levels (Keeves & Alagumalai, 2005).

Table 3 shows the results of item analysis in the form of item parameter estimation results, as well as item fit statistics in the form of infit mnsq, outfit mnsq, and PTMEA correlations. The results of the analysis show that there is one item that does not fit the model (misfit) because it has an outfit mnsq > 1.5 and a PTMEA correlation <0.20, namely item A04 "*Dibanding teman-teman, saya termasuk yang tidak terlalu peduli dengan keamanan barang-barang milik saya*." Thus, there are 16 items that are fit for RSM. One item that does not fit needs to be studied further in order to produce an explanation about the possible causes of the item not fit.

Table 3
Item Fit Statistics

Item	Measure	Infit mnsq	Outfit mnsq	PTMEA	Ket
A13	1.01	.98	.94	.33	Fit
A05	.83	.80	.82	.32	Fit
A08	.81	.93	.91	.50	Fit
A015	.62	1.23	1.27	.40	Fit
A11	.41	.93	.91	.57	Fit
A07	.35	.84	.86	.45	Fit
A14	.21	.95	1.02	.37	Fit
A10	.16	.86	.86	.41	Fit
A09	.12	.80	.83	.33	Fit

Table 3 (Continued)
Item Fit Statistics

Item	Measure	Infit mnsq	Outfit mnsq	PTMEA	Ket
A19	-.42	1.17	1.19	.28	Fit
A12	-.42	.89	.90	42	Fit
A16	-.45	1.02	1.07	.29	Fit
A18	-.50	1.13	1.13	.45	Fit
A21	-.67	1.10	1.11	.32	Fit
A02	-.90	1.22	1.24	.39	Fit
A01	-1.16	1.20	1.19	.27	Fit
A04	-1.10	1.46	1.53	.11	Misfit

Description: Infit = inlier-pattern-sensitive fit statistic; Outfit = outlier-sensitive fit statistic; mnsq = mean square; PTMEA = Point Measure Correlation

Rating Scale Diagnostic

Misbach and Sumintono (2014) mentioned that the functioning of a rating scale is a very important aspect in the process of evaluating the psychometric properties of measurement instruments. Testing the functioning of the rating scale is carried out by verifying the rating assumptions given in the instrument.

Table 4
Rating Scale Diagnostic

Observed Average	Andrich Threshold	Observed Count (%)	Infit mnsq	Outfit mnsq	Category
-1.01	NONE	1641 (20)	2	1.04	1-Strongly Agree
-.61	-1.15	2292 (28)	1.04	1.06	2-Agree
-.23	-.35	2138 (26)	.93	.91	3-Neutral
.21	.46	1332 (16)	.91	.90	4-Disagree
.47	1.03	677 (8)	1.09	1.13	5-Strongly Disagree

Table 4 shows that the observed average value increases from the lowest category, which is 'Strongly Agree' (-1.01 logit) to the highest category, which is 'Strongly Disagree' (0.47 logit). The same increase also occurs at the Andrich threshold whose values are -1.15, -.35, .46, and 1.03 logit for each threshold. Furthermore, the response frequency for all categories is >10 and all response options have Infit and Outfit mnsq <2.00. These findings indicate that the materialistic personality measurement instrument in this study has good response functioning in accordance with the guidelines for the interpretation of the rating scale functioning proposed by Linacre and Wright (2012).

Reliability

Unlike the classical approach (CTT; classical test theory), instrument reliability in Rasch modeling consists of respondent reliability and item reliability (Bond & Fox, 2015; Wright & Masters, 1982). The test results show that the reliability of the items on the materialistic personality scale is almost perfect, which is equal to 0.99. The analysis also shows that the reliability of the respondents on the materialistic personality scale test is 0.55. This value indicates that internal consistency in this study is weak. In addition, the reliability value for Cronbach's

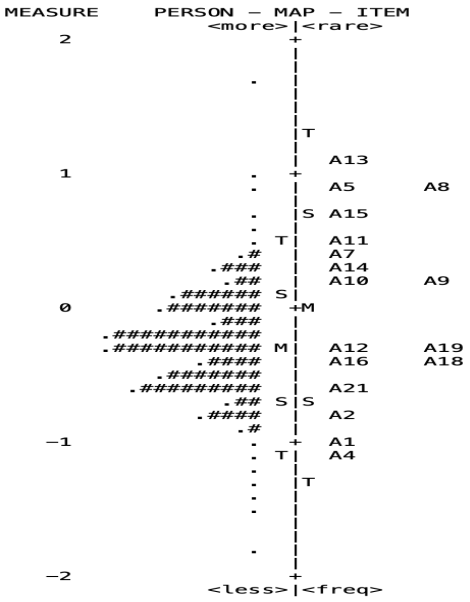
Alpha on the materialistic personality scale is 0.57 (weak).

Wright Map

The Wright Map is a graphic that contains a description of the direct relationship between the location of the items (level of difficulty) and the level of materialism of the respondents (Boone et al., 2014). Figure 1 shows that the most difficult item to agree on is item A13 "*Tidak masalah bagi saya untuk memberi tumpangan bagi mereka yang tidak memiliki kendaraan*." On the other hand, the easiest item to agree on is A1 "*Saya marah jika ada sesuatu yang dicuri dari saya, sekalipun sesuatu itu harganya tidak seberapa*." The mean value of the materialism of the respondents was -0.36 (*SD*=0.44), which is lower than the average difficulty level of item 0. Furthermore, the distribution of persons ranged from -2.09 to 1.67 which exceeded the difficulty range of items -1.16 to 1.01.

However, it is important to note that in the interpretation in Figure 1, there appears to be a gap in item location between item A19 (measure = -0.42 logit) and item A09 (measure = 0.12 logit). Upon closer inspection, it is evident that the gap is filled by a threshold coverage of four thresholds for each item. Therefore, even though it appears that there is a gap, considering that the instrument being tested is not an item with a dichotomous score format, the gap is actually filled by the threshold range.

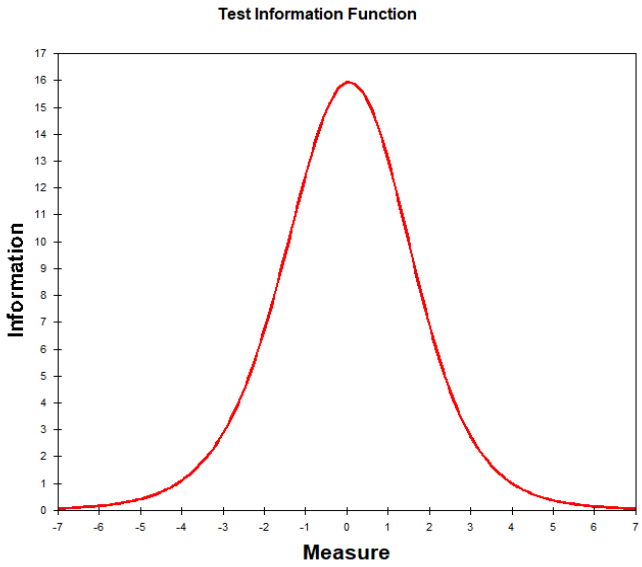
Figure 1
Wright Map



Test Information Function (TIF)

Whether TIF is well obtained or not depends on the relationship between the instrument and the respondent being measured (Sumintono & Widhiarso, 2014). Figure 2 is a TIF graph which explains that the information obtained from the measurement results is very high at the materialistic personality level with a range of -0.07 to 0.21 logit. The test results show that the peak of the TIF curve is at 0.07 logit. These results provide information that the instrument used will provide maximum information or is suitable for use on respondents with moderate levels of materialism in the range -0.07 to 0.21 logit.

Figure 2
Test Information Function



Differential Item Functioning (DIF)

DIF analysis in Rasch modeling can be performed to find and mark (flag) items that experience DIF. The method used in this study is the Rasch-Welch t-test. The *t* probability value is below 5% (<0.05) and also the DIF contrast is greater than 0.30 indicating items that are biased (Liu & Bradley, 2021). The DIF test based on sex was carried out on 505 students (116 boys and 389 girls). Based on the Rasch-Welch t and DIF contrast significance values in Table 6, it was found that there were three items that experienced DIF (prob <0.05 and DIF contrast > 0.30), namely A1, A13, and A16. These findings will be discussed further in the paper.

Table 5
Differential Item Functioning (DIF)

Item	DIF effect size (contrast)	Rasch-Welch t	Prob.	Information
A1	0.44	4.18	0.000	Biased
A2	0.14	1.38	0.443	Not biased
A4	-0.05	-0.45	0.498	Not biased
A5	-0.17	-1.40	0.405	Not biased
A7	-0.24	-2.25	0.014	Not biased
A8	-0.12	-1.00	0.583	Not biased
A9	0.16	1.48	0.135	Not biased
A10	0.08	0.78	0.936	Not biased
A11	-0.11	-1.04	0.306	Not biased
A12	0.00	0.00	0.984	Not biased
A13	-0.31	-2.45	0.027	Biased
A14	-0.05	-0.51	0.646	Not biased
A15	-0.22	-1.99	0.04 1	Not biased
A16	0.33	3.29	0.000	Biased
A18	0.00	0.00	0.556	Not biased

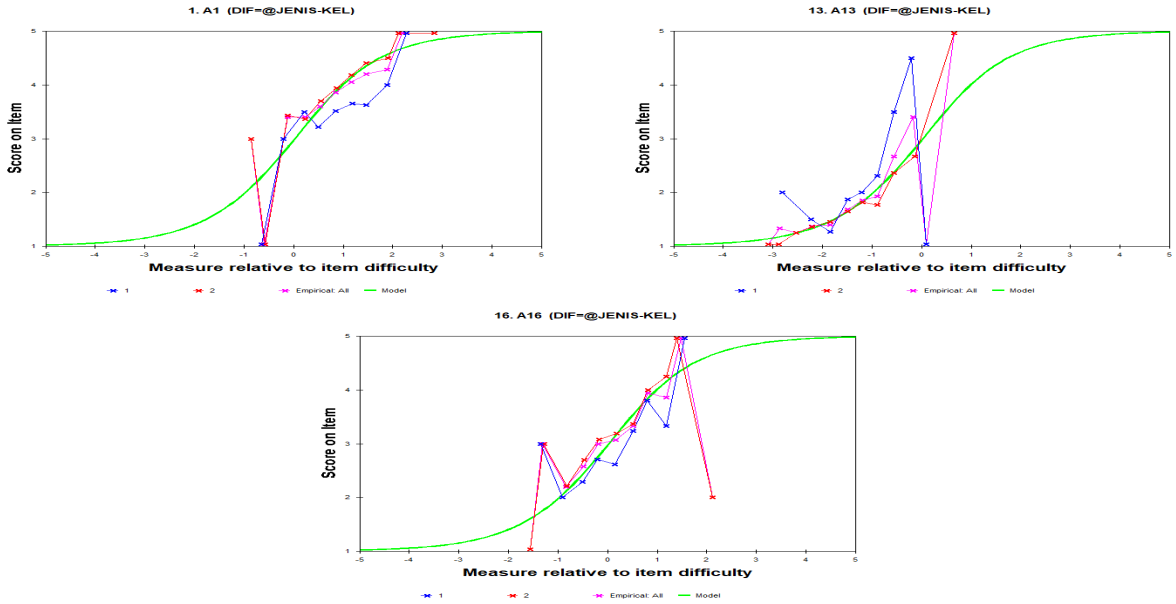
Table 5 (Continued)

Differential Item Functioning (DIF)

Item	DIF effect size (contrast)	Rasch-Welch t	Prob.	Information
A19	-0.06	-0.62	0.3 99	Not biased
A21	-0.03	-0.30	0.416	Not biased

Figure 3

Measure Relative to Item Difficulty



Discussion

This study uses the RSM method to reveal the psychometric properties of the materialistic personality scale. The assumption tests carried out in this study investigated unidimensionality and local independence. This study also revealed evidence of construct validity by reporting item fit, the functioning of the rating scale, and information on the reliability of the items and the respondents. In addition, DIF analysis was also carried out based on sex differences.

The first assumption test performed is the unidimensionality assumption test. Brentari and Golia (2013) described that unidimensionality is a fundamental requirement when using Rasch modeling in order to obtain latent trait measurements. In this study, it was found that the assumption of unidimensionality in the materialistic personality instrument, containing 21 test items, was met. This meant that all items on the materialistic personality scale were singular in measuring the materialistic personality construct.

The second assumption test looked into local independence. There were four pairs of items that experienced local dependence, namely pairs of items A20 "*Saya mengumpulkan banyak souvenir*" with items A19

"*Saya suka mengoleksi berbagai benda*", items A06 "*Saya senang berbagi dengan orang lain apa pun yang saya miliki*" with items A05 "*Saya senang menyumbang untuk kegiatan amal*", item A17 "*Saya iri pada orang-orang bisa membeli apapun yang mereka inginkan*" if with item A11 "*Saya merasa iri ketika ada teman yang bisa memiliki apa yang tidak mampu saya beli*", and partner item A03 "*Saya tidak terlalu bersedih ketika kehilangan sesuatu*" with point A04 "*Dibanding teman-teman, saya termasuk yang tidak terlalu peduli dengan keamanan barang-barang milik saya*".

The four item pairs experienced local dependence. For example, A20 "*Saya mengumpulkan banyak souvenir*" when paired with A19 "*Saya suka mengoleksi berbagai benda*". This meant that when the respondent reaches a high level of ability to answer item A20, his response to that item depends on his response to item A19. Respondents considered that "*mengoleksi berbagai benda*" is closely related to "*mengumpulkan banyak souvenir*". This finding confirms the findings of previous studies which stated that the cause of local independence being violated is the similarity of item wording (Bandalos, 2021). The same occurrence happened to the other three pairs of items, namely the response to one item depended on the response to the other item. Zenisky et al. (2001) stated that local dependence can have a serious impact on both statistical modeling. Therefore, items A20, A3, A4, A6, A17 which have a high degree of dependency on other items were excluded from the analysis.

The number of items that did not meet the local independence assumption test in the Rasch modeling is due to the original scale of materialistic personality (Belk, 1985; Ger & Belk, 1996) tested using a classical test theory approach such as Confirmatory Factor Analysis (CFA) which has not considered testing local assumptions independence. During the scale development period, Rasch modeling using the RSM approach was rarely used.

After testing the assumptions, a statistical fit test was carried out to see the suitability of the data against the Rasch RSM model. In this study, based on the item fit criteria used in this study, it was evident that there was one item that did not fit the model, namely item A04 "*Dibanding teman-teman, saya termasuk yang tidak terlalu peduli dengan keamanan barang-barang milik saya*" with an outfit value mnsq 1.53 > 1.50. This meant that A04 was an item that was affected by outliers so that it did not fit the Rasch model. Based on the location of the items, it was known that item A04 was the easiest item for respondents to agree with (item measure = -1.10 logit), but many respondents who had a high level of materialism responded strongly disagree (aberrant response), and vice versa. This is what causes this item to have a high mnsq outfit and become unfit. In addition to the mnsq outfit, the impact of the aberrant response also occured on the differential power of items which were relatively low (PTMEA = 0.11 <0.20) because many respondents with very low materialism (< -1.10 logit) responded strongly to item A04. Thus, item A04 is recommended to be excluded in future use of this instrument.

Psychometric property testing with the RSM also showed the good functioning of the rating scale of the materialistic personality instrument. This is shown from observed average of each response category which increased consistently from the low category to the higher category. Furthermore, the Andrich threshold value for each response category also increased monotonically from the lowest to the highest category. The functioning of the rating scale was also supported by the Infit and Outfit mnsq whose values are acceptable (< 2.00) in all response categories (Linacre & Wright, 2012). These findings indicated that the use of a rating scale in the materialistic personality scale worked well and was not confusing for respondents.

Moreover, in regards to reliability, this study found that the reliability of materialistic personality scale items was 0.99. These findings indicated that the sample size in this study was sufficient to confirm the distribution of item difficulty levels from the easiest to the most difficult (Linacre, 2023). However, the reliability of the respondents showed opposite results, namely 0.55 which was included in the unfavorable category. These findings indicated that the instrument was not sensitive enough to be able to distinguish respondents with high and low levels of materialism (Tennant & Conaghan, 2007). The unfavorable reliability of the respondents occurred because there were several items that had a low discriminatory index (PTMEA correlation). The same effect also applies to the Cronbach's Alpha reliability coefficient of 0.61. If a comparison was made with previous studies, the Cronbach's Alpha value on the original scale (Belk, 1985) also showed sufficient value, as well as research

(Ger & Belk, 1996) in several different cultures with a reliability coefficient of 0.46 – 0.79. However, even though the reliability of the respondents was classified as poor, this finding did not have an impact on the validity of the instrument because the reliability only applies to this study sample. Future research is expected to conduct reliability tests on research samples.

TIF on the materialistic personality scale provides information that the instrument used will provide maximum information or is suitable for use in respondents with a moderate level of materialism. At very low to moderate low levels of materialism, the information obtained from the measurement results with materialistic personality instruments was quite low. Likewise, with very high to high levels of materialism, the information obtained was also quite low.

The DIF results showed that there were three items that functioned differently (experiencing DIF) between male and female respondents, namely items A1, A13, and A16. This finding is not surprising because various studies have found gender differences in research on materialism such as a study conducted on a sample of Americans which found that there were differences in the level of materialism between men and women (Segal & Podoshen, 2013). In addition to that, another study in Pakistan also found similar findings (Umar et al., 2016) and the same findings were also replicated by a recent study on a sample of Americans which showed differences in the level of materialism between men and women (Keech et al., 2020).

In this study, the occurrence of item bias can be explained from a content perspective, namely the study of item wording. As for item A1 "*Saya marah jika ada sesuatu yang dicuri dari saya, sekalipun sesuatu itu harganya tidak seberapa*" showed that women get a higher score than men (*DIF* contrast = 0.44). This item contains details, irritability, nurture, and sensitivity that women tend to have. Wallendorf and Arnould (1988) explained that women emphasize social ties with the goods they own, while men tend to represent their achievements through the things they own. The sensitivity that women have causes them to get angry more easily if their things are stolen. On the other hand, point A13 "*Tidak masalah bagi saya untuk memberi tumpangan bagi mereka yang tidak memiliki kendaraan*" showed that men get a higher score than women (DIF contrast = -0.31). The bias occured due to society's view of greater responsibility and power in men, while women were considered not proficient in using vehicles. Additionally, it is a cultural tradition for men to give rides to women, whereas women to give rides to men are considered impolite and inappropriate. Setiyarini and Hidayah (2014) explained that people need to consider driving habits. Men will prefer to give rides because of masculine identity and views of greater responsibility in men.

The last item, namely item A16 "*Setiap kali membeli hadiah untuk orang yang saya kasihi, saya juga membeli sesuatu untuk diri saya sendiri*" showed that in this item, women's scores tend to be higher than men's (DIF contrast = 0.33). This is supported by impulsive behavior in women when they see attractive items. Henrietta (2012) mentioned that women in early adulthood are more impulsive than men. Gkasiorowska (2011) clarified that the tendency to buy impulsively is positively related to the level of stimulation and sensation. For women, this will be easier to obtain, one of which is through shopping. Higher female performance on A16 is also associated with female behavior that tends to be jealous of other people's possessions. Chae (2017) described that women tend to compare their own possessions with those of other people which will result in envy. When buying things for other people, women will feel envy when they don't have things that are bought for other people. There are three items that are (DIF), so users need to consider gender in obtaining scores on these items. The intent of taking gender differences into account is either to include gender variables in the model as previous studies have done eg, Cheng et al. (2016) or to carry out a DIF-gender test on any future use of this instrument. In this study, three items found to have DIF were not excluded from the analysis but flagged as items with the potential to experience DIF due to gender differences which need to be considered in future use of this instrument.

Conclusion

Based on the results of the research, the conclusion in this study is that the materialistic personality scale that is in accordance with the Rasch modeling consists of 16 items. The response categories in the rating scale were able to function properly. TIF showed that the item on the materialistic personality scale was very precise and gave optimal results when used on respondents who have moderate materialism. In this instrument, there are also three items marked as having DIF (flagged as DIF).

Recommendation

The implication of this study is that the 16 points materialistic personality scale can be used to measure materialistic personality. Materialistic personality measurement tools can be used in various fields in psychology, especially social psychology, clinical, educational and consumer psychology. The limitation in this study is the disproportionate distribution of respondent characteristics (gender, age, ethnicity, domicile). It is recommended for future researchers to evaluate the use of the scale in a wider age range and detect DIF in different geographic areas and levels of education.

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Author Contribution

RMW conceptualized and wrote publication manuscripts. RH provided supervision.

Conflict of Interest

The authors declared no conflict of interest in the production of the manuscript.

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