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Minimizing Social Desirability in Questionnaires of Non-Cognitive Measurements

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Abstract: Data obtained through questionnaires sometimes respond to the items presented by social norms, so sometimes they do not suit themselves. High social desirability (SD) in non-cognitive measurements will cause item bias. Several ways are used to reduce item bias, including freeing respondents from not writing their names or being anonymous, explaining to the participants to respond to each statement honestly, as they are or according to themselves, and responding to the questionnaire online or offline. This research aims to prove that several methods can minimize the possibility of item bias SD and academic dishonesty (AD). The research was carried out with an experimental study using a factorial design. There were 309 respondents who were willing to be involved in this research. Data analysis was carried out using multivariate ANOVA. The research results show differences for all variables, Self-Deceptive Enhancement (SDE), Impression Management (IM), and AD in the anonymous group. There are differences in AD in the groups that provide a complete explanation and do not explain, and there is an interaction between the average AD based on the anonymous and explanation group.

Keywords: *Academic dishonesty, item bias, questionnaires, social desirability.*

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Introduction

Questionnaires are one of the measuring tools used to collect research data. The form of a questionnaire that researchers widely use is usually a self-report with a Likert type. Collecting data using questionnaires has the advantage of its content being structured and data collection being done classically or individually on various occasions. Unfortunately, the questionnaire is usually in the form of a self-report. If it is not appropriately designed, it allows participants to provide responses that are tailored to social expectations. The responses given when filling out the questionnaire can be influenced by the surrounding environment, so it is possible that the responses given do not reflect themselves. This is done to cover up weaknesses or to be socially accepted. This phenomenon is called the social desirability response. In this way, the data obtained does not match your self-image and tends to have high social desirability (Uziel, 2010).

Social desirability is a person's tendency to give more socially acceptable responses and deny less acceptance by society's culture (Phillips & Clancy, 1972; Vésteinsdóttir et al., 2019; Widhiarso, 2011), Responding based on social appropriateness or socially desirable responding (SDR) is a tendency to give positive assessments in describing oneself (Paulhus, 2002). This tendency to give a positive response when describing oneself can occur when working on or filling out a questionnaire. The behavior that occurs most often is the tendency of respondents to choose positive responses to favorable or supportive items, negative to unfavorable items, and middle or moderate to items that are not understood or uncomfortable, giving negative responses to favorable items. Respondents detected to answer with high social appropriateness will give higher scores to items containing positive behavior or over-reporting and respond with lower

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scores when encountering statements that lead to negative behavior or under-reporting (Hart et al., 2015). This mismatch with actual responses causes answers to be biased (Larson, 2019), thereby threatening the accuracy of the results and the practical relevance or recommendations of research findings (Phillips & Clancy, 1972).

Psychologists have carried out much research on social desirability responding. Several instruments have been developed to detect the presence of SD in this research. Among them: Edward Social Desirability (Edwards, 1957), Marlowe-Crowne Social Desirability Scale which is shortened to MCSDS (Paulhus, 2002; Ventimiglia & MacDonald, 2012), Self-Deception Questionnaire or SDQ and Other-Deception Questionnaire or ODQ, Brief Social Desirability Scale (BSDS), the Overclaiming Questionnaire or OCQ (Bing et al., 2011), and The Balanced Inventory of Desirable Responding or BIDR (Hart et al., 2015). The Balanced Inventory of Desirability Responding (BIDR) is also called the Paulhus Deception Scale. BIDR measures respondents' tendency to distort responses in self-reports to display responses more in line with social desirability rather than giving actual responses. BIDR consists of two scales, namely Self-Deceptive Enhancement (SDE) and Impression Management (IM), each of which consists of 20 items. The SDE scale measures the tendency to respond according to social appropriateness, which is done unintentionally because the respondent believes that the response given is appropriate or accurate for him. The IM scale measures the tendency to give responses according to social propriety, which is done deliberately to increase self-worth so that the answers given are inaccurate (Holden & Fekken, 2020).

Social desirability is often related to dishonest behavior (Cheung & Egan, 2021; de Vries et al., 2014; Fernandes et al., 2023). In the selection process, participants often respond dishonestly to psychological tests or scales (Pavlov et al., 2019). Participants overestimate themselves by adding positive self-ratings and subtracting negative self-ratings. Such responses will cause bias and obtain inappropriate data. Not only in selection, dishonesty often appears in the academic field. Students cheat because they want to be considered as someone who is able to do academic questions. Therefore, individual will make various efforts to get high assessment results even though it is not in accordance with his efforts. Even though they use different methods, their intentions are the same to get a positive assessment of themselves. Thus there is a relationship between social desirability and academic dishonesty (Eastman et al., 2008; Winrow et al., 2015).

Although the two have different concepts. One form of cheating that often occurs is academic cheating. This fraud is a problem in universities in Indonesia and abroad, including well-known universities (Aulia, 2015). Various forms of cheating that often occur are using gadgets during tests (electronic cheating), asking for help with answers from outside sources, and plagiarism (Eastman et al., 2008). Because of the link between AD and social desirability, several studies on AD have removed the influence of SD when it is related to other variables (Gannon et al., 2007; Zhang et al., 2023). The concept of AD is different from social desirability, which is more directed at behavior that adapts to social demands. The correlation of AD and SD in studies shows varying results, as well as when looking at the correlation with the dimensions of SDE and IM. Thus, the relationship between AD, SDE, and IM must be explored further.

Several studies have shown that questionnaires answered dishonestly have detected SD. Answers tend to be underreported in surveys regarding smoking, drugs, alcohol, abortion, bankruptcy, energy consumption, criminal behavior, and racist attitudes (Tourangeau & Yan, 2007). Meanwhile, exaggerated responses or over-reporting occurred in surveys related to voting, sports, seat belt use, library card ownership, energy conservation, interest in buying organic food, and surveys during the US presidential election (Larson, 2019). Personality measurements in job selection were also detected as being answered dishonestly (Feeney & Goffin, 2015; Vésteinsdóttir et al., 2019), as were personality measurements in the clinical field using the Minnesota Multiphasic Personality Inventory (Edwards & Edwards, 1992).

The existence of social desirability in non-cognitive measurements using questionnaires is a phenomenon that is difficult to control. However, there are several ways to reduce bias due to responses that contain social desirability. These efforts can be carried out directly and indirectly. The method or method used directly is by freeing respondents from writing their names anonymously (Larson, 2019). When collecting data, the researchers allow respondents to not writing specific names respondents by not writing specific names or identities to maintain respondents' privacy. This condition will make respondents feel free to express their opinions, ideas, and emotions openly (Ben-Ze'ev, 2003). This emotional openness will make respondents answer honestly.

Another way to minimize SD that is done directly is to remind you to respond to answers honestly. Researchers need to explain to respondents by putting pressure on the instrument to be filled in as is and not to lie by reducing or exaggerating response options. Research shows differences in subject responses to the language. Researchers emphasize not lying and cheating, which is included in the instructions for filling out the instrument (Bryan et al., 2013). These efforts make the subject feel the need to respond honestly according to the instructions presented. Thus, the clarity of giving instructions also influences respondents' honesty in giving answers. The results showed varying correlation coefficients in survey research involving social desirability. Some studies found that online surveys yield lower social desirability compared to paper surveys, but other studies found higher social desirability (Dodou & De Winter, 2014)

This research uses several methods to minimize social desirability by comparing respondents in several groups and providing different instrument presentations. Other presentations are carried out in different ways. Several methods that can be used to reduce bias are freeing respondents from not writing their names or being anonymous and writing their

full names, and asking participants to respond honestly, as they are or according to themselves, and groups by collecting data online and offline. Based on the explanation above, the hypothesis that will be answered in the research is:

1. There is a relationship between social desirability in the form of SDE and IM and academic cheating
2. There are differences between SDE, IM, and AD, which are presented online and offline
3. There are differences between SDE, IM, and AD, which are presented with explanations, and those which are not explained
4. There are differences between SDE, IM, and AD, which are presented anonymously and by giving full names

Methodology

Sample size

The subjects in this study were undergraduate students in Universitas Negeri Yogyakarta- Indonesia. To estimate the sample size of A x B x C factorial design, with $i= 2$ levels of A, $j = 2$ levels of B, and $k= 2$ levels of C this study used the effect size f of .25 (medium), α error probability of .05, power statistic of .80, and number of groups were 8. The sample size was calculated using G*Power 3.1.9.7 software. The minimum total sample based on the criteria was 270.

Respondent

A total of 309 university students aged 18 to 22 years were involved ($M_{age}= 19.3$; $SD_{age}= 0.724$). The subjects consisted of 253 females (81.9%) and 56 males (18.1%). Subjects were from the Faculties of Education and Psychology as well as the Faculty of Language, Arts, and Culture of Universitas Negeri Yogyakarta- Indonesia.

Research Design

The research used a $2 \times 2 \times 2$ factorial design as depicted in figure 1. The factors were delivering method [A] (online and offline), subject's identity [B] (with identity and anonymous), and explanation [C] (with and without explanation. In term of delivering method, subject in online group filled out the instrument via online survey using Google Form. Meanwhile in offline group, the participants responded the scale in a paper and pencil survey (printed instrument). In term of identity of participants, subject in identity group was asked to write down their full name. In the anonymous group, subjects were asked to write an anonymous name. In term of explanation, the group with an explanation was given a verbal and written explanation that the subject needed to answer each statement honestly, as it is in accordance with the subject's true self. The subject was also told that there were no consequences in filling this out, all answer choices given by the subject were correct if they were in accordance with the subject's true self. While the group without explanation was not given the emphasis to do it honestly and according to the subject's true self.

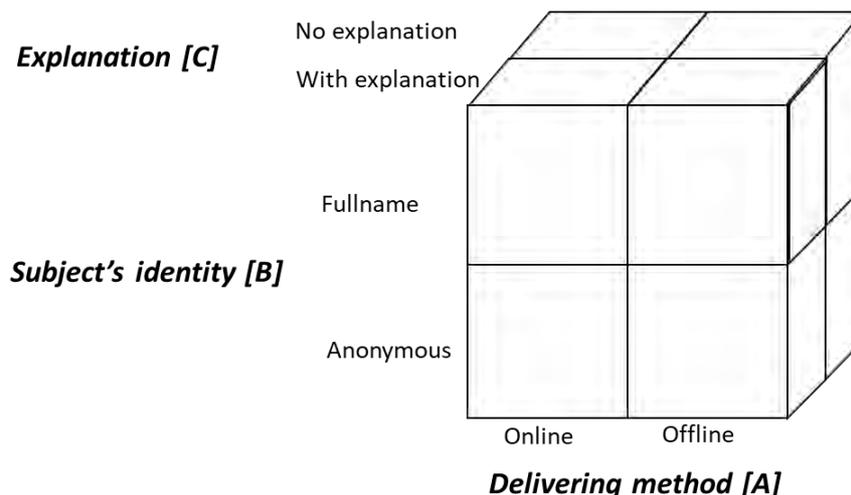


Figure 1. A schematic of a $2 \times 2 \times 2$ factorial design

Based on the three kinds of treatments above, there are eight experimental groups as follows: (1) A1B1C1/ Online-Identity-Explanation Group; (2) A1B1C2/ Online-Identity-No Explanation Group; (3) A1B2C1/ Online-Anonymous-Explanation Group; (4) A1B2C2/ Online-Anonymous- No Explanation Group; (5) A2B1C1/ Offline-Identity-Explanation Group; (6) A2B1C2/ Offline-Identity-No Explanation Group; (7) A2B2C1/ Offline-Anonymous-Explanation Group; (8) A2B2C2/ Offline-Anonymous- No Explanation Group. The distribution of the number of subjects in each group is presented in Table 1.

Table 1. Distribution of subject in the experimental groups

Delivering method	Identity	Explanation	N
Online	Full name	With explanation	37
		No explanation	45
	Anonymous	With explanation	29
		No explanation	62
Offline	Full name	With explanation	34
		No explanation	34
	Anonymous	With explanation	38
		No explanation	30

Instrument

The instruments for this research are Balanced Inventory of the Desirability Responding (BIDR) and the Academic Dishonesty (AD) scale. The BIDR version 16 was adapted and validated in the previous year's research. Revalidation analysis was carried out on 531 UNY student data collected. Model fit analysis using Confirmatory Factor Analysis (CFA) showed that the two-factor model produced an unfit factor structure ($c^2/df=9.436$; $GFI=0.960$; $CFI= 0.764$; $RMSEA=0.126$; $SRMR=0.100$) and the four-factor model produced a more fit factor structure ($c^2/df=3.75$; $GFI=0.985$; $CFI= 0.927$; $RMSEA=0.072$; $SRMR=0.063$). The 4 factor CFA results produced in this study were similar to the results of previous research. Factor 1 contains SDE dimension items that are scored positively (favorable), factor 2 contains IM dimension items that are scored positively (favorable), factor 3 contains SDE dimension items that are scored in reverse (reverse items), and factor 4 contains IM dimension items that are scored in reverse (reverse items).

An academic dishonesty scale was also used in this research to detect cheating in the examination (Faradiena, 2019). On this scale, subjects are asked to respond to 11 statements, such as "When taking exams, I use cheat sheets in the form of small notes." In responding to each statement, subjects were asked to choose a response from 1 (never), 2 (ever once), 3 (ever twice), and 4 (never more than twice). The dishonesty scale had a good unidimensional model fit ($c^2/df=2.15$; $CFI= 0.979$; $TLI= 0.973$; $RMSEA=0.057$). The academic dishonesty scale items used have factor loadings above 0.4 (range 0.405-0.785). In this study, Cronbach's α reliability was estimated at 0.829, with item rest correlation ranging from 0.348 to 0.620.

Analyzing of Data

Data analysis was carried out by Multivariate Analysis of Variance (MANOVA) from a general linear model or multiple-path ANOVA. Pillai's trace was used in analysis with criteria of sig. statistics is less than 0.05 then groups differ significantly (Field, 2018). The effectiveness of the treatment was tested the difference in all variables, which are a combination of SDE, IM, and AD on pathways A (online), B (identity), and C (explanation), and the differences between each variable. In this analysis, interactions between the three groups were also tested.

Findings/Results

The research results are explained through data transcription and hypothesis testing. The data description shows the number of respondents, mean, standard deviation and normality for each dimension or research variable and each group. The descriptive data of respondents to this study is presented in Table 2. It also shows that most of the data met the normal distribution, as shown by the results of the Shapiro-Wilk p analysis which is more than 0.05, except for the online-anonymous-no explanation, online-full name-no explanation, and offline-anonymous-no explanation groups. This data distribution is also confirmed by the results of the Shapiro-Wilk multivariate normality test which shows $W= 0.993$ and $p= 0.161$. The results of the multivariate homogeneity test also show homogeneous data $\chi^2 = 42.0$, $df=43$, $p=0.42$. Based on the results of the assumption test, the normality and homogeneity of the data is proven and the hypothesis test analysis can be continued with multivariate ANOVA.

Table 2. Statistical Description of the Data

	Online	Identity	Explanation	SDE	IM	AD
N	Online	Anonymously	explanation	62	62	62
			no explanation	29	29	29
		full name	explanation	45	45	45
			no explanation	36	36	36
	Offline	Anonymously	explanation	30	30	30
			no explanation	38	38	38
		full name	explanation	34	34	34
			no explanation	34	34	34
Mean	Online	Anonymously	explanation	4.6	5.18	24.3
			no explanation	4.52	4.88	25.8
		full name	explanation	4.5	5.31	27.1
			no explanation	4.7	5.11	25.4
	Offline	Anonymously	explanation	4.39	4.9	27
			no explanation	4.43	4.9	24.3
		full name	explanation	4.56	5.2	26
			no explanation	4.77	5.1	31.5
SD	Online	Anonymously	explanation	0.794	0.958	7.41
			no explanation	0.814	0.969	6.04
		full name	explanation	0.701	0.956	7.78
			no explanation	0.956	0.822	7.5
	Offline	Anonymously	explanation	1.17	0.994	7.45
			no explanation	1.03	0.838	6.86
		full name	explanation	0.732	0.899	7.31
			no explanation	0.8	0.936	6.93
Shapiro-Wilk p	Online	Anonymously	explanation	0.537	0.139	0.013
			no explanation	0.786	0.275	0.325
		full name	explanation	0.677	0.608	0.061
			no explanation	0.664	0.781	0.029
	Offline	Anonymously	explanation	0.34	0.44	0.428
			no explanation	0.076	0.705	0.044
		full name	explanation	0.31	0.503	0.063
			no explanation	0.71	0.412	0.576

Hypothesis Test Results

SDE, IM, and AD are the variables studied in this study. The results of correlation analysis between variables show the strength of the relationship, which shows the relationship between variables. The results of the analysis of the relationship between variables are presented in Table 3. The results of the analysis show that there is a positive correlation between SDE and IM ($r=.342$, $p=0.000$). A high IM score will follow a high SDE score. A low IM score will follow, and vice versa, a low SDE score. There is a negative correlation between SDE and AD ($r=-.150$, $p=.008$), also IM and AD ($r=-.330$, $p= 0.000$). This shows that the higher the SDE and IM scored, the lower the respondents academic dishonesty.

Table 3. Correlation between SDE, IM, and AD Variables

	IM	AD
SDE	.342**	-.150**
	0.000	0.008
IM	1	-.330**
		0.000

Three hypotheses will be tested in this Manova, namely: 1) there are differences in the social desirability of responses (SDE and IM) and academic dishonesty (AD) in online and offline classes, both overall and for each variable, 2) there are differences in SDE, IM and AD of responses data presented with explanations and no explanations, 3) There are differences SDE, IM and AD responses which are presented anonymously and by giving full names to both the whole and each variable. The overall analysis results are shown in Table 4 and partially in Table 4.

Table 4. The Overall Difference in Test Results

Classes	F	df1	df2	p
Online	1.332	3	298	.264
Identity	5.753	3	298	<.001
Explanation	1.390	3	298	.246
Online*Identity	1.127	3	298	.338
Online*Explanation	0.811	3	298	.489
Identity*Explanation	1.101	3	298	.349
Online*Identity* Explanation	3.968	3	298	.009

The results of the analysis between variables in each group were carried out using Multivariate Pillai's Trace, as presented in Table 4. The analysis results show overall differences in the SDE, IM, and AD variables in the identity groups ($F=5.752$, $p < 0.001$). This means there is a difference in the overall means of SDE, IM, and AD in the group that did not give a name or anonymously and the group that gave a complete name. Meanwhile, there was no difference in the groups presented online and offline. Likewise, the group where the instructions were explained and presented simply or without explanation. From the interactions between variables, there are interactions in online, identity and explanations ($F=3.968$, $p = .009$). Further analysis to test differences in means for each variable and group is presented in Table 5.

The results of different tests on each variable analyzed in this study show differences in academic dishonesty (AD) between identity groups ($F=77.912$, $p = 0.006$). The group whose name was written in full on their identity had a higher mean score than those whose name was not written. The group that received an explanation had a lower mean than those who did not receive an explanation. There was no difference in SDE and IM in the three treatments. Judging from the results of the interaction between groups, it shows that there is no difference in SDE and IM in the interaction between variables. At the same time, in the average AD, there is an interaction between online, identity, and explanation ($F=113.605$, $p < .001$).

Table 5. Univariate Analysis for SDE, IM, and AD between Groups

Classes	Dependent Variable	Sum of Squares	df	Mean Square	F	p
Online	SDE	0.1442	1	0.1442	0.1898	.663
	IM	11.364	1	11.364	13.296	.250
	AD	1.973.135	1	1.973.135	37.700	.053
Identity	SDE	10.925	1	10.925	14.378	.231
	IM	27.578	1	27.578	32.266	.073
	AD	4.077.735	1	4.077.735	77.912	.006
Explanation	SDE	0.4653	1	0.4653	0.6124	.435
	IM	19.317	1	19.317	22.600	.134
	AD	203.435	1	203.435	0.3887	.533
Online*Identity	SDE	11.947	1	11.947	15.724	.211
	IM	0.1013	1	0.1013	0.1185	.731
	AD	597.728	1	597.728	11.421	.286
Online* Explanation	SDE	0.0888	1	0.0888	0.1169	.733
	IM	0.7196	1	0.7196	0.8419	.360
	AD	383.902	1	383.902	0.7335	.392
Identity* Explanation	SDE	0.9696	1	0.9696	12.760	.260
	IM	7.02e-4	1	7.02e-4	8.21e-4	.977
	AD	764.981	1	764.981	14.616	.228
Online* Identity* Explanation	SDE	0.0534	1	0.0534	0.0703	.791
	IM	0.1865	1	0.1865	0.2182	.641
	AD	5.950.540	1	5.950.540	113.695	<.001

Interaction between groups is used to analyze differences in data on two variables based on the figure presented. One variable is distinguished from the horizontal line and the other variable is a separator. The figurer of interactions resulting from this research are presented based on SDE, IM, and AD data on identity and explanation interactions. Based on figurer 2 and 4, it can be concluded that to get the data with low SDE and AD, the best method to collect data is by allow subject to give anonymous identity and give explanation on how to fill out the questionnaire.

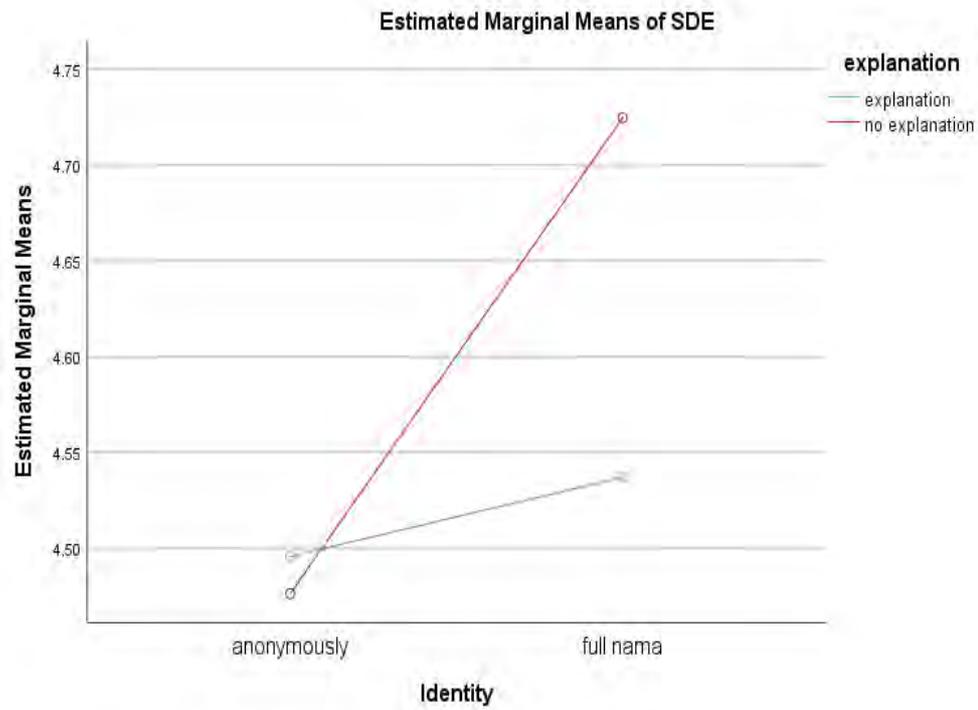


Figure 2. The Interaction SDE between Identity and Explanations

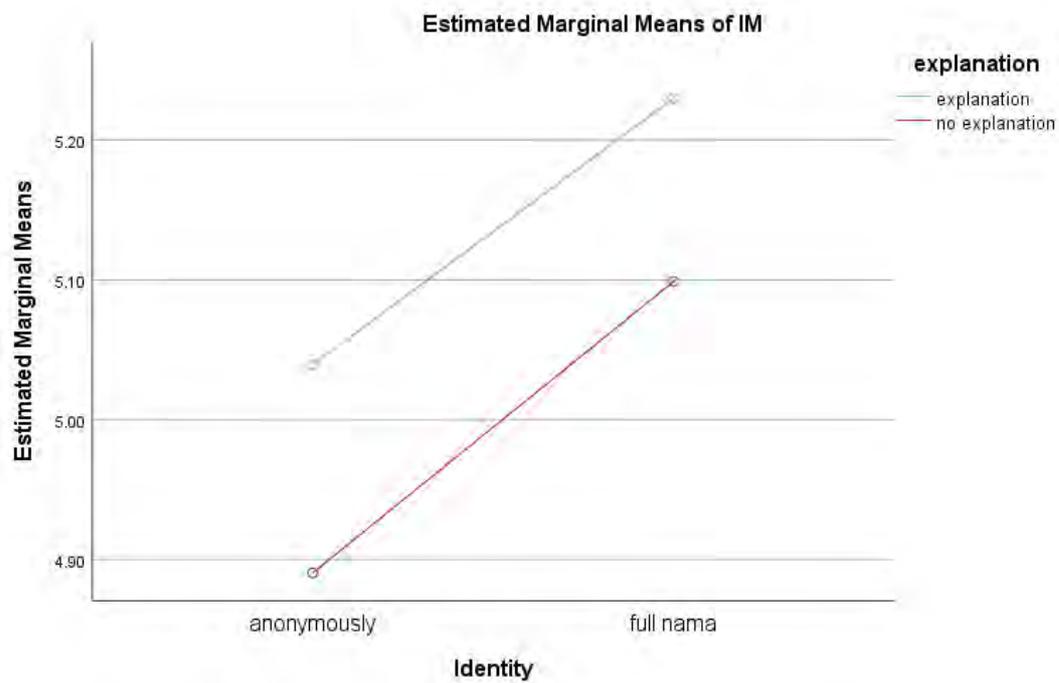


Figure 3. The Interaction IM between Identity and Explanations

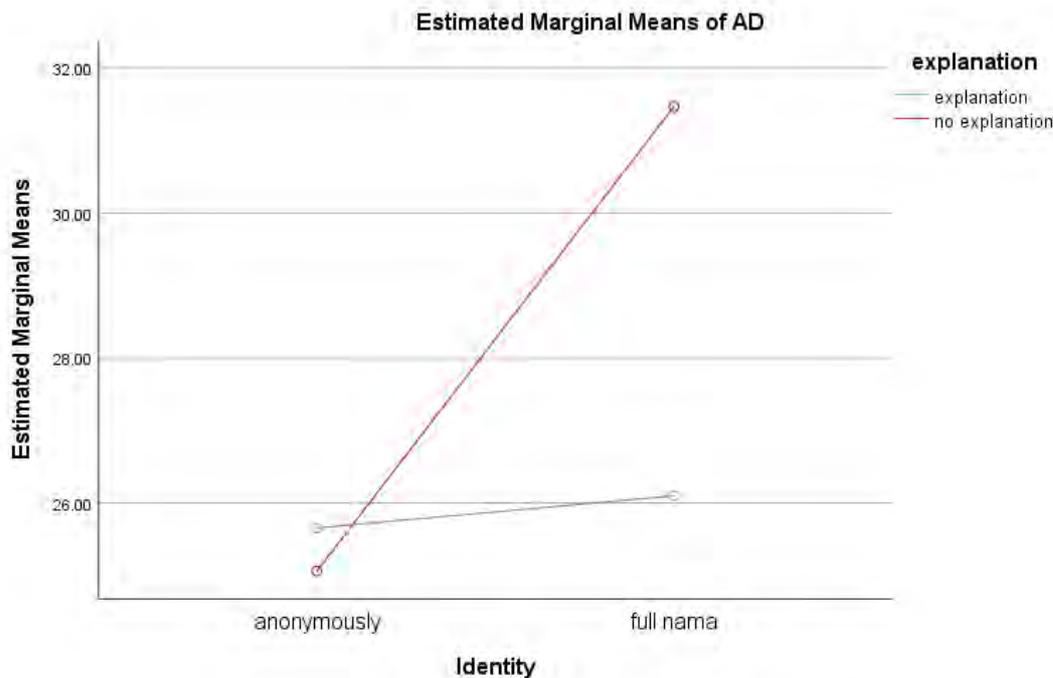


Figure 4. The Interaction AD between Identity and Explanations

Discussion

There is a negative correlation between SDE and IM with AD. This shows that the higher the SDE and IM scores, the lower the respondent's recognition of academic dishonesty. This shows a difference between social desirability response and academic dishonesty or cheating. If social desirability is a response society expects, then academic dishonesty is not socially expected behavior. AD is also related to moral behavior, but a high AD score indicates immoral behavior. On the other hand, people are said to be moral when they do not show dishonest behavior in academics. Thus, the correlation between AD and SD, as represented by SDE and IM, becomes negative. These results indicate that dishonesty in elementary school is different from academic dishonesty. This negative correlation is in line with research results that found the SDE and IM scores with immoral behavior to be negative (Ward & King, 2018).

The study results showed an overall difference in the mean between the groups who worked anonymously and wrote their full names. The overall average score of SDE, IM, and AD by writing their full name got a higher average score than anonymous. When someone fills out a questionnaire by writing their full name, they will realize that other people will be able to know the responses given. Hence, efforts to fill in according to social propriety are higher than without writing their identity. Disguised identity allows subjects to respond to items freely. It is not bound or embarrassed if their response is not socially accepted. The higher AD scores for identity data where the name was written in full compared to anonymously in this study used this instrument as a self-report so that when responding by writing one's name, it would sometimes be more honest and accountable.

The research results showed differences in the recognition of committing academic dishonesty (AD) between the groups that provided a complete explanation and those that did not. The average AD without explanation is higher than with explanation. Providing explanations makes respondents better understand the content and what should be done when filling out the respondent. Providing this explanation will make respondents confident in answering honestly so that the average AD score will be lower.

SDE and IM scores on data taken online are no different than online. The freedom to respond to activities carried out online and offline is no different. Respondents are equally free to answer questionnaires, whether online or offline. Thus, giving questionnaires online is the same as offline, and vice versa.

The limitation of using self-reported questionnaires is still able to cause invalid responses (Demetriou et al., 2015). Self-reported respondent can give inaccurate answers to questions, especially those about normative behaviors. Because it is possible for respondents to answer not as it is or tend to follow good responses that are recognized by social norms or can be said to be social desirability bias. This is because they are aware that they are being researched, especially subjects carrying a certain identity in the research. Indirectly the use of self-reported questionnaires is interpreted as a question about the respondent's identity or whether they are someone who has conformed to the norm so that individual characteristics influence the response process to social psychological measures (Brenner & DeLamater, 2016). The limitation of using self-reported questionnaires is still able to cause invalid responses (Demetriou et al., 2015). Self-reported respondent can give inaccurate answers to questions, especially those about normative behaviors. Because it is possible

for respondents to answer not as it is or tend to follow good responses that are recognized by social norms or can be said to be social desirability bias. This is because they are aware that they are being researched, especially subjects carrying a certain identity in the research. Indirectly the use of self-reported questionnaires is interpreted as a question about the respondent's identity or whether they are someone who has conformed to the norm so that individual characteristics influence the response process to social psychological measures (Brenner & DeLamater, 2016).

Figures 1 and 3 show the interactions between SDE and AD based on identity and providing explanations, and there is no interaction in IM from Figure 2. The image below shows the low average SDE and AD in anonymous data, both with explanations and without explanation. The average SDE and AD tended to be the same in the group that received explanations in the instructions, with very little difference between the anonymous group and those who wrote their full names. However, in scores that did not receive an explanation, the average SDE and AD in the anonymous group were low. Still, it was high for the group who wrote their full names. These results show that there is consistency in the group results by providing an explanation before filling out the questionnaire and that there are inconsistent or different results in the anonymous and full name groups.

Conclusion

Based on the results and discussion, it can be concluded that there is an overall mean difference in social desirability and academic dishonesty (SDE, IM, and AD) in the identity group, but there is no difference in the online or offline presentation and explanation group. Specifically, in AD, partial differences are found in identity and explanation groups. There is an average interaction data between identity and presentation, especially in SDE and SD, and there is no interaction in IM.

Recommendations

This study's results show differences in the overall mean of social desirability and academic dishonesty across identity groups. To enhance the accuracy of the study by using self-report as an instrument, the subject of the survey could write down their identity anonymously. Anonymous identity allows the subject to be more honest in giving a response to the self-report questionnaire, which could lead to accuracy. Furthermore, the researcher may provide an explanation of the instructions to improve the understanding of the subject when giving responses on self-report and to reduce the item bias. The measuring tool in this research is the BIDR social desirability scale, which is correlated with the Likert-type academic dishonesty scale. Other research shows that using a ranking scale can reduce social desirability. Thus, further research to correlate BIDR using a ranking-type measuring instrument could be an alternative to lowering social desirability. Several ranking-type measuring tools, such as pair comparison, stimulus ranking, or statements of more than 2 with certain combinations, are interesting for further research.

Limitations

This research has attempted to randomize the groups that will receive certain treatments. However, this research still needs to improve its implementation, especially in performing experiments that were not carried out equally for each group. Different researchers also carried out data collection in this experiment, so it is possible that external factors influenced the data obtained. The situation in conducting experiments, organizing research, and reading instructions to different researchers can still affect research results.

Ethics Statements

The study design has been approved by the ethics committee at the Institute of Research and Community Service, Yogyakarta State University No. T/17.1/UN34.9/KP.06.07 /2023 and all study participants provided informed consent.

Conflict of Interest

The authors declare no potential competing interest

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Authorship Contribution Statement

Setiawati: Conceptualization, design, analysis, writing. Widyastuti: Data analysis, drafting manuscript. Fathiyah: Critical revision of manuscript, data acquisition. Husna: Editing, data acquisition.

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