Article Type: Research Paper

Do obedience pressure and incentive affect whistleblowing?

Fuadhillah Kirana Putri, Dewi Kusuma Wardani and Adam Damara

Abstract

Research aims: This study aims to empirically test the effect of obedience pressure on whistleblowing intentions and the role of incentives in moderating the obedience pressure on whistleblowing intentions.

Design/Methodology/Approach: The method of analysis used in this research is experimental to test empirically the phenomenon of the causal relationship between obedience pressure and incentives on whistleblowing. This study uses a sample of experimental class results of Accounting Study Program students at Sarjanawiyata Tamansiswa University.

Research findings: This study indicates that obedience pressure has a significant effect on whistleblowing intentions. On the other hand, incentives do not strengthen the positive effect of obedience pressure on whistleblowing intentions because, under high pressure, employees will still do whistleblowing in the presence or absence of incentives.

Theoretical contribution/Originality: The results of this study are expected to be useful for future researchers who will examine whistleblowing, especially those influenced by obedience pressure and incentives.

Practitioner/Policy implication: This research is expected to be an input for the organisation to consider that incentive reward is not the only way to enhance staff's motivation to do whistleblowing.

Research limitation/Implication: The limitations of this study were that it used student subjects as research participants, the research instrument had not explicitly described the amounts of incentives provided by the company to whistleblowers, and only examined the role of incentives in moderating obedience pressure on whistleblowing intentions.

Keywords: Incentive; Obedience Pressure; Whistleblowing

AFFILIATION:
Department of Accounting, Faculty of Economics, University of Sarjanawiyata Tamansiswa, Special Region of Yogyakarta, Indonesia

***CORRESPONDENCE:**
fuadhillah.putri@ustjogja.ac.id

DOI: 10.18196/jai.v25i3.22308

CITATION:
Putri, F. K., Wardani, D. K., & Damara, A. (2024). Do obedience pressure and incentive affect whistleblowing? *Journal of Accounting and Investment, 25*(3), 1175-1195.

ARTICLE HISTORY
Received:
09 May 2024
Revised:
16 Jul 2024
15 Aug 2024
20 Sep 2024
Accepted:
30 Sep 2024

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JAI Website:

Introduction

The more advanced and developed the economy, the more the practice of economic crime develops in various forms. This crime in the accounting world is often referred to as fraud. According to The Association of Certified Fraud Examiners (ACFE), Fraud is an illegal act conducted purposefully by someone inside or outside the organisation for a specific goal (manipulating or supplying false reports to other parties) for personal or group gain, either directly or indirectly affecting other parties (ACFE, 2022). The ACFE classifies fraud into three kinds depending on actions: asset theft, fake financial reporting, and corruption. Fraud is not solely done by means of corruption or theft; it also involves fraud.

Fraud can be committed by deviant actions such as concealing documents, falsifying reports for business purposes, or sharing confidential information with parties outside the company without the knowledge of the authorised party (Wardani & Ngara, 2022). The existence of this fraud makes the organisation/company suffer losses, which also has an impact on employees. To prevent this fraud, whistleblowing actions arise. The whistleblowing system is one method that can be used to prevent fraud in a company or organisation (Lee & Fargher, 2013). Whistleblowing is the revelation by members of the organisation of unlawful, unethical, or illegal conduct to parties that can take action to correct the problem (Chen et al., 2017). Whistleblowing is a series of efforts that a person makes to raise concerns, and they accidentally turn into a whistleblower because of management's response, not yet followed up with actual evidence that raises concerns repeatedly raised by whistleblowers (Vandekerckhove & Phillips, 2019). The handling of the whistleblowing system is expected to increase awareness of maintaining integrity in the organisation because without this system when the whistleblower reports fraud in carrying out his duties, the whistleblower may not feel safe (Wardani et al., 2021). Whistleblowing actions are carried out by whistleblowers. All company employees can carry out whistleblowers in the company.

The phenomenon of whistleblowing became known to the public after the emergence of a number of fraud cases in large American companies. The most famous fraud case was the Enron scandal in 2001. Enron committed fraud by manipulating financial reports to make its performance look good (Ayem & Rumdoni, 2021). This manipulation is also done so that the shares remain attractive to investors. This case involved the public accounting firm Arthur Andersen, which scrutinised Enron's financial statements for years. Another fraud case occurred in 2023 at the multinational company from India Adani Group. Adani Group was shown to have committed money laundering, theft of government funds, and corruption, totalling around US$ 17 billion or Rp 252 trillion.

The latest whistleblowing case in 2024 occurred at the Boeing aeroplane maker in the United States. John Barnett, a former Boeing employee, said that mistakes caused very serious safety problems for the Boeing 787 Dreamliner. According to John Barnett, workers at one of Boeing's factories installed defective parts on an aeroplane that was being repaired, did not document the damage, worked outside of procedures, and did not maintain control of the aeroplane's configuration. John Barnett began taking legal action after retiring from Boeing after receiving retaliation and a hostile work environment from the company.

According to the ACFE titled Asia-Pacific Occupational Fraud 2022, the biggest fraud case in Indonesia is corruption, with 64% of all fraud cases. The high number of corruption cases makes Indonesia ranked 110 out of 180 countries. According to data from Indonesia Corruption Watch (ICW), in 2023, there were 791 corruption cases in Indonesia, with a loss of IDR 28,4 trillion. In 2022, there were 579 corruption cases in Indonesia, with a loss of IDR 48.79 trillion. In 2021, there were 533 corruption cases in Indonesia, with a loss of IDR 62.93 trillion. Meanwhile, in 2020, 1218 corruption cases occurred in Indonesia, resulting in a loss of IDR 56.7 trillion. Clearer data can be seen in the Table 1.

Table 1 Data on Corruption Cases in Indonesia According to Indonesia Corruption Watch (ICW)

Year	Total Cases	Total Loss
2023	791	Rp 28.4 trillion
2022	579	Rp 48.79 trillion
2021	533	Rp 62.93 trillion
2020	1218	Rp 56.7 trillion

Whistleblowing actions are influenced by several factors, namely obedience pressure and incentives. This study builds on prior research undertaken by Setianto (2016), which looked at the influence of obedience pressure and confidence in leaders on whistleblower intentions. This research was conducted using an experimental method to test the relationship between obedience pressure and incentives to whistleblowing. Obedience pressure occurs when someone undertakes an activity or action that requires them to obey directions from a superior or someone in a position of authority (Chotimah & Kartika, 2018).Meanwhile, incentives are prizes or assistance offered to people or organisations to help them achieve certain objectives or accomplish specified activities (Denis et al., 2006). Obedience pressure is categorised into two levels, namely high and low. This research was tested in a situation where the finance division staff learns of fraud committed by the head of the finance division. In this situation, the finance division staff is pressured not to report the fraud, and if they report the fraud, they will get an incentive in return. From this situation, the researcher wants to know whether there is an effect of the high pressure or low pressure exerted by the head of the financial division on fraud and the presence of incentives in exchange for whistleblowing actions. This study differs from past studies in that it includes incentive variables as moderating variables. Whistleblowing incentives have yet to be well examined in the study, despite the fact that rewards can be quite beneficial in combating corruption instances (Teichmann & Falker, 2020). Research conducted by Pulungan et al. (2020) shows that incentives have a positive effect on the intention of whistleblowing. Meanwhile, research conducted by Pulungan (2018) shows that incentives do not affect the intention of whistleblowing.

This study intends to explore the influence of obedience pressure on whistleblowing intentions and test whether incentives have a favourable effect on whistleblowers' intentions or not. This research is expected to show the role of accounting and accountants in various whistleblowing processes. This study is expected to provide useful material for policy development and assessment of whistleblowing implementation so that it can run optimally. The best whistleblowing can act as an early warning system that can save the country from greater losses.

Literature Review and Hypotheses Development

Compliance Theory

According to the Compliance Theory proposed by Milgram (1963), individuals have the possibility of conflict over actions taken where the action is not in accordance with

individual values and beliefs if the individual is the subject of pressure to obey someone's power. This theory states that a person who is given obedience pressure will make psychology (taking action according to individual values and beliefs becomes taking action according to the wishes of the authority) so that decision-making becomes inaccurate. Compliance Theory Milgram (1963) states that individuals tend to obey other individuals in positions of authority. The existence of this compliance results in individuals being able to do unethical things according to the authority of their superiors. Milgram (1974) concluded that individuals generally tend to follow orders from figures who have authority, even to the point of killing innocent humans. Individuals tend to obey orders because they know that it is necessary/right. Still, some individuals do the order because of coercion or because of a belief that the one responsible for compliance behaviour is the source of authority, not the individual who does it. This psychological state can create significant barriers to whistleblowing, as individuals may feel compelled to comply with directives that conflict with their ethical beliefs.

Expectancy Theory

According to the Expectancy Theory, the theory proposed by Vroom (1964) states that people can be motivated if they have certain expectations. This theory explains choice and how people make choices. The decision about how much effort to exert in a given situation is known as motivation. This choice is based on a two-stage expectancy sequence, where effort leads to performance, and performance leads to a specific outcome or reward. Employee motivation is influenced by the belief that putting in a certain level of effort will result in the desired performance goal. In addition, motivation is influenced by the employee's perceived opportunities to achieve various outcomes as a result of achieving performance goals. Ultimately, a person's motivation depends on how much they value the outcomes or rewards they receive. Whistleblowing can be seen as a complex decision-making process influenced by the expectations of potential outcomes. According to Potipiroon (2024), the expectation of rewards for whistleblowing, such as organisational support or personal integrity, plays a crucial role in motivating individuals to report unethical behaviour (Potipiroon, 2024). In this study, organisational support as the outcome to enhance employees' intention to do whistleblowing is the incentive. This aligns with Vroom's assertion that if individuals believe their actions (whistleblowing) will lead to positive outcomes (e.g., organisational change, personal satisfaction), they are more likely to engage in such behaviour.

Obedience Pressure

Obedience pressure is a situation when someone performs an activity or action that must follow orders from a superior or someone with more power than them (Chotimah & Kartika, 2018). Obedience pressure is a scenario that generates physical and psychological stress, affecting emotions, thinking processes, and working conditions. In this situation, the pressure comes from the work environment where people work (Sari et al., 2017). Pressure is the motivation of someone who is forced to do deviant actions (Wardani & Saputri, 2023). Obedience pressure is an order given in the form of coercion by superiors or clients to deviate from professional standards (Cahyaningrum, 2017). When someone

receives an order from a superior to do something they want to do, they feel pressure to comply, which may violate professional standards and ethics (Libriani & Utami, 2015). Pressure can be measured by not fulfilling the perpetrator's desire to behave, deviating from professional standards, opposing the perpetrator's desire to maintain professionalism, and opposing superiors when forced to do things that violate professional and ethical standards (Jamilah et al., 2007).

In a group with low obedience pressure, Cahyaningrum & Utami (2015) found empirical results that showed more appropriate audit decisions. Junior auditors who get higher obedience pressure from clients or superiors will behave ineffectively by taking actions that are outside of professional standards. Employees tend to avoid whistleblowing if their superiors force them. This can be caused by the fear of the consequences that will be obtained if they do not follow the orders of their superiors. As a result, they sometimes adapt to the situation. In other words, they do not do things that can attract the attention of others, especially the company's superiors. This action is in line with compliance theory, which states that individuals who face obedience pressure will suffer psychological problems because the decision is made under pressure from the superior; therefore, the decision made is biased (Milgram, 1963). According to the description and analysis above, the first hypothesis is as follows:

H1*: The subjects who are under low obedience pressure conditions will have a higher intention to take whistleblowing action than the subjects who are under high obedience pressure conditions.*

Incentives

Incentives are rewards or support given to individuals or groups to encourage them to achieve certain goals or perform desired actions (Denis et al., 2006). Incentives aim to motivate individuals or groups to work harder, achieve set targets, or perform actions expected by the company or organisation. Incentives can be used in a variety of contexts, including in business environments to encourage employee performance, in research fields to encourage participation in studies, or in government to encourage compliance with policies or regulations (Teichmann & Falker, 2020). Companies can use incentives to persuade individuals to carry out whistleblowing by showing the identity of the whistleblower, making it easier for the authorities to track whistleblowing cases through communication with the whistleblower (Wijayanti & Yandra, 2020).

Expectancy theory Vroom (1964) states that when the focus person does something that results in internal or external incentives, they are more likely to do whistleblowing. If individuals experience obedience pressure, they work under pressure, but the company imposes incentives on whistleblowers as a form of financial reward. In that case, the tendency of a person to report fraud or other unlawful practices in the organisation will increase. This idea is in line with the expectation theory, which states that individuals are more likely to come forward and report wrongdoings if they feel that correcting the observed misconduct is a realistic aim. Individuals in the organisation also will be more

motivated by the incentive received as the outcome expected after becoming whistleblowers as an attempt they did before. According to the description and analysis above, the second hypothesis is as follows:

H2: *Incentives strengthen the tendency of the subject to engage in whistleblowing under high obedience pressure conditions.*

According to the hypotheses, the study framework is as Figure 1.

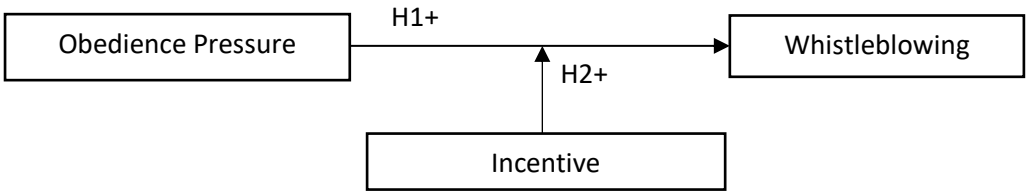

Figure 1 Research Method

Research Method

Types of Research and Data Collection Techniques

This study used experimental methods to examine the phenomena of the causal link between obedience pressure and incentives for whistleblowing. In this case, researchers analysed which conditions, obedience, pressure, and incentives can influence whistleblowing. The independent variable in this study was obedience pressure. Obedience pressure is an order given in the form of coercion by superiors or clients to deviate from professional standards (Cahyaningrum, 2017). Obedience pressure is manipulated into two levels, namely high and low. Meanwhile, the moderating variable in this study was incentives, namely rewards or gifts given to someone as a reward or encouragement to do an action or achieve a certain goal. Money, bonuses, allowances, or other types of gifts with value or advantages for the receiver can all be used as incentives (Teichmann, 2019). Incentives are manipulated into two levels, namely, the presence of incentives and the absence of incentives. The factorial pattern used in this study is 2 x 2 between subjects. Consequently, each participant in this trial had an equal probability of receiving one of the treatments given. For more details, the description of the 2x2 between subject experimental research design can be seen in the Table 2.

Table 2 2 x 2 Between-subject Experiment Design

Condition/treatment	Incentive	
	With Incentive	**No Incentive**
High Obedience Pressure	CELL 1 (TKT-AI)	CELL 2 (TKT-TI)
Low Obedience Pressure	CELL 3 (TKR-AI)	CELL 4 (TKR-TI)

In this study, researchers investigated undergraduate students majoring in Accounting at Sarjanawiyata Tamansiswa University Yogyakarta as the research respondents. Students were used as subjects in this study because the nature of information processing and decision-making between students and practitioners has patterns and characteristics that are not much different (Nahartyo, 2012). Psychological literature explains that real-world decision-makers have the same information-processing patterns and characteristics as university students (Nahartyo, 2012). Students who became experimental subjects had taken business ethics and auditing courses with the expectation that they understood the concept of ethics and fraud follow-up. Then, participants voluntarily followed a series of experimental procedures to minimise the seriousness of students participating in this experiment.

Stages of Research

Before experimenting, the researcher conducted a pilot test (initial testing). The purpose of this test was to determine the quality and efficacy of the manipulation method (Nahartyo & Utami, 2016). At the pilot test stage, the researcher had the opportunity to make improvements to the research scenario script and scan for external (environmental) factors that could disrupt the experimental results (Cooper & Schindler, 2014).

After the pilot test was conducted, the next stage was the implementation of the core experiment. The experimental procedure in this study was adopted from Setianto (2016) with modifications. Respondents in this study acted as purchasing division staff who faced a situation of fraud when one supplier asked the head of the purchasing division for help in getting a new contract and promised to give 15% of the contract value to the head of the purchasing division. From this situation there are 2 different situations: the first is that the staff is threatened by the head of the purchasing division to choose the supplier (high obedience pressure). The second is that the purchasing division staff is asked by the head of the purchasing division to choose a supplier that meets the company's criteria (low obedience pressure). If the purchasing division staff reports the fraud, there are 2 different situations. Namely, the first gets an incentive for reporting the fraud, and the second does not get an incentive for reporting the fraud.

The implementation of the experiment begins by randomly dividing the subjects into four groups with different treatments in each group, namely the treatment of high obedience pressure, low obedience pressure, the presence of incentives, and the absence of incentives. The four experimental groups consisted of group 1 (high obedience pressure – with incentives), group 2 (high obedience pressure - no incentives), group 3 (low obedience pressure – with incentives), and group 4 (low obedience pressure - no incentives). Different modules were prepared for each experimental group. In the implementation, subjects were put in one room, and then the experimenter read the rules before data collection began. After that, the experimenter distributed modules to all subjects and started working on the module by giving time for each page so that all participants filled the module at the same time.

The module work was carried out for fifteen minutes for all groups. Within a certain time, subjects were expected to be able to complete all questions, even though the treatment experienced in each experimental group was different. Completed modules were then gathered. After the experimental class was finished, the researcher returned to the manipulated atmosphere (debriefing), explaining the purpose and benefits of the study.

Descriptive analysis in experimental research is used to display the research data in general, both the magnitude and variability of the data, reveal absolute differences in the demographic characteristics of members of each manipulation group and control group, and explain whether there are differences in subject backgrounds. The descriptive analysis used in this study was the minimum value, maximum value, mean, and standard deviation of participants.

Validity is defined as the extent to which a measurement can fulfil its measuring function (Cooper & Schindler, 2014). In other words, an instrument is said to be valid if the instrument measures what should be measured. In this study, a content validity test was conducted to ensure the quality of the data obtained and to measure the quality of the cases provided. The research instrument was examined by several accounting lecturers who were experienced in the field of experimentation as a form of validity test. Furthermore, the validity test was carried out through a pilot test.

Table 3 First Manipulation Check Instrument for Assignment

No.	Question	Answer
1.	In this assignment, what role do you play?	Staff in the purchasing division
2.	Who is your supervisor?	Head of the purchasing division
3	One of your duties in the company is?	Prepare a statement of financial position.

Manipulation checks are carried out to gain confidence that participants have received manipulation in size and shape, according to the researcher's design. One way to check manipulation is by giving a number of questions and analysing the subject's answers. Subjects who successfully answer questions satisfactorily are declared to have passed testing or checking manipulation (Nahartyo & Utami, 2016). Manipulation checking was carried out after the experimental procedure was carried out. The description of the manipulation instrument and its answers can be seen in the Table 3 and Table 4.

Table 4 Manipulation Check Instrument for the Pressure of Obedience Treatment and Incentive Treatment

No.	Description	Question	Obedience pressure treatment manipulation check answer	
			High	**Low**
1.	Second manipulation for the Pressure of Obedience	Do you feel pressure to lose your job if you do not help accept the acquaintance of the head of the purchasing division to get a new contract at PT ISTIMEWA?	Yes	No
2.	Third manipulation for the Incentive	Does the company reward staff who report fraud with incentives?	**Incentive treatment manipulation checks answer**	
			With Incentive	**No Incentive**
			Yes	No

This study was then randomised. Randomisation is the allocation of participants in the experimental and control groups at random without respect for variables inherent in the subject. Each subject got the same chance to be in the experimental group or control group. The randomisation test was conducted by conducting Chi-Square and ANOVA testing to ensure that the placement of participants was randomised. Chi-square testing was used to show no significant difference between cells with regard to gender, while ANOVA was used to show no significant difference between cells for age and Grade Point Average (GPA) (Nahartyo & Utami, 2016).

Experimental error is the result of several factors that interfere with the causal relationship between the independent variable and the dependent variable, originating from the characteristics of the subject, experimental environmental conditions, and the experimenter's behaviour (Nahartyo & Utami, 2016). Error tests were conducted using two-way ANOVA with demographic characteristics as the independent variable and the Whistleblowing variable as the dependent variable. The significance level in this test is 0.05. If the significance value is more than 0.05, then the demographic characteristics of participants do not affect the intention to do Whistleblowing. Conversely, if the significance value is less than 0.05, then the demographic characteristics of participants influence the intention to do whistleblowing. If the demographic characteristics variable affects the intention to do Whistleblowing, then these variables are used as control variables.

Hypothesis testing in this study used ANOVA testing using the SPSS statistical tool. This test is used to test and observe the comparison of means of two or more groups of data. The ANOVA test used a two-way ANOVA type because there is one dependent variable on a metric scale (interval), one independent variable, and one moderating variable on a nonmetric scale (categorical or nominal).

This study will test the main effect and interaction effect. The main effect test is used to determine the effect of the independent variable on the dependent variable without taking into account the effect of other independent variables. In comparison, the

interaction effect is used to test the effect of a factor on the dependent variable that can depend on other factors.

The first hypothesis of this study states that the subjects who are under low obedience pressure conditions will have a higher intention to take whistleblowing action than the subjects who are under high obedience pressure conditions. This hypothesis is answered by comparing the average Whistleblowing score between cell 1 TKT-AI and cell 2 TKT-TI with cell 3 TKR-AI and cell 4 TKR-TI. The hypothesis will be supported if the average value of the Whistleblowing value of cell 1 TKT-AI and cell 2 TKT-TI is lower than cell 3 TKR-AI and cell 4 TKR-TI.

Meanwhile, the second hypothesis of this study is that incentives strengthen the tendency of the subject to take whistleblowing under high obedience pressure conditions. This hypothesis is answered by conducting an interaction test. It is said that there is an interaction effect if there is a difference in the mean between cell 1 TKT-AI and cell 2 TKT-TI, where the value of intention to whistleblowing in cell 1 TKT-AI is lower than cell 2 TKT-TI.

The significance level used in this study is 5% (0.05). This proves that the error rate in this study is 5% or with a confidence level of 95%. If the P value ≤ 0.05, then the hypothesis is supported. Meanwhile, if the P value ≥ 0.05, the hypothesis is not supported.

Result and Discussion

Experiment Implementation

The implementation of the experiment began on September 21, 2023, and continued until October 3, 2023. The research participants were 5th-semester students of the Accounting Study Program at Sarjanawiyata Tamansiswa University, with the criteria that they had taken Auditing and Business Ethics courses. Students who are willing to become experimental participants are 97 participants. Details of the number of students based on the 5th-semester class who participated in this study are described in the Table 5.

Table 5 Breakdown of Experiment Participants by Semester 5 Classes

No	Class Origin	Number of Participants
1	A1	34
2	A2	38
3	A3	25

Manipulation Check

After data collection, a manipulation check was conducted. The manipulation check is to find out whether participants understand the contents of the experimental module. There are 6 questions in the manipulation check with the aim of knowing whether participants understand the contents of the experimental module. Participants are said to pass the manipulation check if they answer all questions correctly. The detail information of each experimental group that pass the manipulation check can be shown in the Table 6.

Table 6 Details of Data Distribution that Can Be Analyzed Further

Description	Experimental Group				Total	Total (%)
	TKT - AI	TKT - TI	TKR - AI	TKR – TI		
Total participant data	25	25	24	23	97	100%
Number of incomplete participant data	0	0	0	0	0	0%
Total number of participants' data that did not pass the manipulation check	8	9	6	7	30	31%
Number of final participant data that can be used for analysis	17	16	18	16	67	69%

Demographic Data Description of Experiment Participants

The total of data that could be used for further testing was 67 participants. Researchers conducted descriptive testing to determine the demographics of participants as a whole and per group. This study identified participant demographic data based on gender, GPA, and age, which will be explained in the Table 7.

Table 7 Demographic Data on the Gender of Experiment Participants

Gender	Experimental Group				Total
	TKT - AI	**TKT - TI**	**TKR -AI**	**TKR - TI**	
Male	0	3	4	6	13
Female	17	13	14	10	54
Total	17	16	18	16	67

Table 7 above shows that the number of female participants is greater than the number of male participants. The TKT-AI group consisted of 0 male participants and 17 female participants. The TKT-TI group consisted of 3 male participants and 13 female participants. The TKR-AI group consisted of 4 male participants and 14 female participants. The TKR-TI group consisted of 6 male and 10 female participants. Overall, there were 13 male participants and 54 female participants.

Table 8 Experiment Participants GPA Demographic Data

GPA	Experimental Group				Total
	TKT - AI	TKT - TI	TKR -AI	TKR - TI	
2.51 – 3.00	0	0	1	0	1
3.01 – 3.50	3	2	2	6	13
3.51 – 4.00	14	14	15	10	53
Total	17	16	18	16	67

Based on the Table 8, data on participants in the TKT-AI group with GPAs in the range of 2.51-3.00 were 0 participants, in the range of 3.01-3.50 were 3 participants, and in the range of 3.51-4.00 were 14 participants. In the TKT-TI group, there were 0 participants with GPAs in the 2.51-3.00 range, 2 participants in the 3.01-3.50 range, and 14 participants in the 3.51-4.00 range. Then, in the TKR-AI group, data on participants with GPAs in the range of 2.51-3.00 were 1 participant, in the range of 3.01-3.50 were 2 participants, and in the range of 3.51-4.00 were 15 participants. In the TKR-TI group, data on participants with GPAs in the range of 2.51-3.00 were 0 participants, in the range of 3.01-3.50 were 6 participants, and in the range of 3.51-4.00 were 10 participants.

Table 9 Demographic Data Age of Experiment Participants

Experimental Group	N	Mean	Std. Deviation	Minimum	Maximum
TKT – AI	17	20.47	0.874	20	23
TKT – TI	16	20.31	0.793	19	22
TKR – AI	18	20.72	1.364	19	23
TKR – TI	16	20.88	1.147	19	23
Total	67	20.60	1.074		

Based on the Table 9, the TKT-AI group had an average participant age of 20.47 years, with a minimum age of 20 years and a maximum age of 23 years. In the TKT-TI group, the average age of participants was 20.31 years, with a minimum age of 19 years and a maximum age of 22 years. The average age of the TKR-AI group members was 20.72 years, with a minimum of 19 years and a maximum of 23 years. Participants in the TKR-TI group had an average age of 20.88 years, ranging from 19 to 23 years.

Data Analysis Results

Randomisation testing was performed by comparing the demographic characteristics of all experimental groups, including gender, age, and GPA. The decision-making criteria state that if the significance value is greater than 0.05, there is no significant difference in participant demographics across experimental groups. In contrast, if the significance level is smaller than 0.05, there is a demographic difference between the experimental groups. The Chi-Square test was utilised in this study to assess nominal scale data, specifically age and gender. The Table 10 shows the results of the Chi-Square test.

Table 10 Chi-Square Test

Characteristics	Pearson Chi-Square	Asymp. Sig (2-sided)
Age & GPA	13.679	0.091

Based on Table 10, the Pearson Chi-Square value for participant gender is 13.679; p> 0.05. This proves that there are no significant differences between the experimental groups regarding the age and grade point average of the participants. Next, the researcher used One-Way ANOVA to conduct randomisation testing on ratio-scale data, namely age and GPA. The Table 11 shows the results of the One-Way ANOVA test.

Table 11 One-Way ANOVA Test

Characteristics	F	Sig.
Age	0.501	0.735
GPA	0.748	0.477

Based on Table 11, the F-value for participant age is 0.501; p> 0.05. This suggests that there is no significant age difference between the experimental groups. The F value for the participants' GPA is 0.748; p > 0.05. As a result, there is no significant difference in GPA among the experimental groups.

Error testing is performed to guarantee that the outcomes of hypothesis testing are not impacted by individuals' demographic features but rather by independent and moderating variables. This test employs the Two-Way ANOVA test. The dependent variable in this test is the intention to whistleblowing, while the independent variable is participant demographic characteristics. The decision-making criteria are that if the significance value is more than 0.05, the demographic characteristics of the participants do not affect their intention to whistleblowing. Conversely, if the significance value is less than 0.05, then participant demographic characteristics affect the intention to whistleblower.

Table 12 Experimental Error Test

Independent Variable	Whistleblowing Intention	
	F	Sig.
GPA	0.339	0.714
Gender	0.362	0.550
Age	0.634	0.641

Table 12 show that the F-value on GPA is 0.339; p> 0.05. Based on these findings, it is concluded that GPA has no significant effect on whistleblower intentions. The F value for gender is 0.362; p > 0.05. This demonstrates that gender has no major influence on the intention to commit whistleblowing. The F-value for age is 0.634; p > 0.05, indicating that age has no significant effect on the desire to whistleblowing. Thus, the outcomes of hypothesis testing are not impacted by individuals' demographic features such as GPA, gender, and age. In other words, the intention to do whistleblowing in this research does not impact GPA, gender, and age.

Before discussing hypothesis testing, Table 13 displays the results of descriptive statistical analysis regarding the intention to conduct whistleblowing by each whistleblowing group.

Table 13 Descriptive Statistics Testing Results

Obedience Pressure	Incentive		Total
	With Incentive	**No Incentive**	
High	Sel 1: TKT-AI	Sel 2: TKT-TI	N = 33
	N = 17	N = 16	Average = 80.30
	Average = 82.94	Average= 77.50	Std. Deviation = 16.486
	Std. Deviation = 16.111	Std. Deviation = 16.931	
Low	Sel 3: TKR-AI	Sel 4: TKR-TI	N = 34
	N = 18	N = 16	Average= 69.41
	Average= 69.44	Average= 69.38	Std. Deviation = 23.217
	Std. Deviation = 21.821	Std. Deviation = 25.421	
Total	N = 35	N = 32	N = 67
	Average= 76.00	Average= 73.44	Average= 74.78
	Std. Deviation = 20.176	Std. Deviation = 21.664	Std. Deviation = 20.770

Based on the Table 13, the TKT-AI group consisting of 17 participants has an average intention to do whistleblowing of 82.94 with a standard deviation of 16.111. The TKT-TI group, consisting of 16 participants, has an average intention to whistleblowing of 77.50 with a standard deviation of 16.931. Then, the TKR-AI group, consisting of 18 participants, had an average intention to do whistleblowing of 69.44 with a standard deviation of 21.821. The TKR-TI group, consisting of 16 participants, has an average whistleblowing to manipulate of 69.38 with a standard deviation of 25.421.

Based on the results of descriptive statistics, the lowest value of staff intention in whistleblowing is in conditions of low obedience pressure with no incentives. In contrast, the highest value of staff intention in whistleblowing is in conditions of high obedience pressure with incentives. The descriptive statistical results need to be tested for significance using two-way ANOVA.

A Two-Way ANOVA test is required to determine the effect of obedience pressure and incentives on employees' efforts to prevent whistleblowing. The Two-Way ANOVA test yielded the following results, with obedience pressure as the independent variable, incentives as the moderating variable, and whistleblowing as the dependent variable.

Table 14 Two-Ways ANOVA Test Results

Source	df	*Mean Square*	F	Sig.
Corrected Model	3	743.502	1.785	0.159
Intercept	1	374121.738	898.195	0.000
ObediencePressure	1	1952.966	4.689	0.034
Incentive	1	126.857	0.305	0.583
Obedience Pressure*Incentive	1	120.543	0.289	0.592
Error	63	416.526		
Total	67			
Corrected Total	66			
Dependent variable: *Whistleblowing*				

Based on the Two-Ways ANOVA test results shown in the Table 14, the F-value of the obedience pressure variable is 4.689 and p=0.034 <0.05. Based on these findings, it is determined that obedience pressure has a major impact on staff efforts to prevent whistleblowing. The findings of the interaction test between obedience pressure and incentives on staff efforts to avoid whistleblowing revealed that they had no effect. This is evident from the F-value of 0.289, p=0.592. Furthermore, the results of assessing the average value of intention to disclose for each therapy based on the proposed hypothesis are reported.

Hypothesis 1 concluded that obedience pressure had a beneficial impact on whistleblower intentions. This hypothesis is tested by comparing the average whistleblowing score of cell 1 TKT-AI and cell 2 TKT-TI, which is greater than cell 3 TKR-AI and cell 4 TKR-TI. Table 13 shows that cell 1 TKT-AI and cell 2 TKT-TI have a total mean score of 80.30 and a standard deviation of 16.486. Meanwhile, cell 3 TKR-AI and cell 4 TKR-TI have a combined mean of 69.41 and a standard deviation of 23.217. This shows that cell 1 AIT-THT and cell 2 AIT-THR are more likely for staff to do whistleblowing because the total average of cell 1 and cell 2 is greater than the total average of cell 3 and cell 4. Furthermore, based on the Two-Ways ANOVA test results in Table 14, there is a significant difference in the mean intention of whistleblowing in conditions of high obedience pressure and low obedience pressure with p=0.034 <0.05. According to the results of statistical testing, H1 is supported.

Hypothesis 2 reveals that incentives strengthen the tendency of the subject to take whistleblowing under high obedience pressure conditions. This hypothesis is answered by conducting an interaction test. It is said that there is an interaction effect if there is a mean difference between cell 1 TKT-AI and cell 2 TKT-TI. Staff will do whistleblowing when there is high obedience pressure when the company applies incentives compared to when the company applies no incentives.

Table 15 One-Way ANOVA Results

	Df	*Mean Square*	F	Sig.
Between Groups	1	109.767	0.252	0.618
Within Groups	65	436.337		
Total	66			

Table 15 shows that the significance level of the average difference between the two is not significant, which is p=0.618> 0.05. Thus, H2 is not supported.

Based on the Figure 2, in conditions of high obedience pressure, staff will be more willing to do whistleblowing when there are incentives (mean = 82.94) or when there are no incentives (mean = 77.50). These results provide additional information regarding the non-support of hypothesis 2. The results of hypothesis testing support H1 and do not support H2. In summary, the results of hypothesis testing are described in the Table 16.

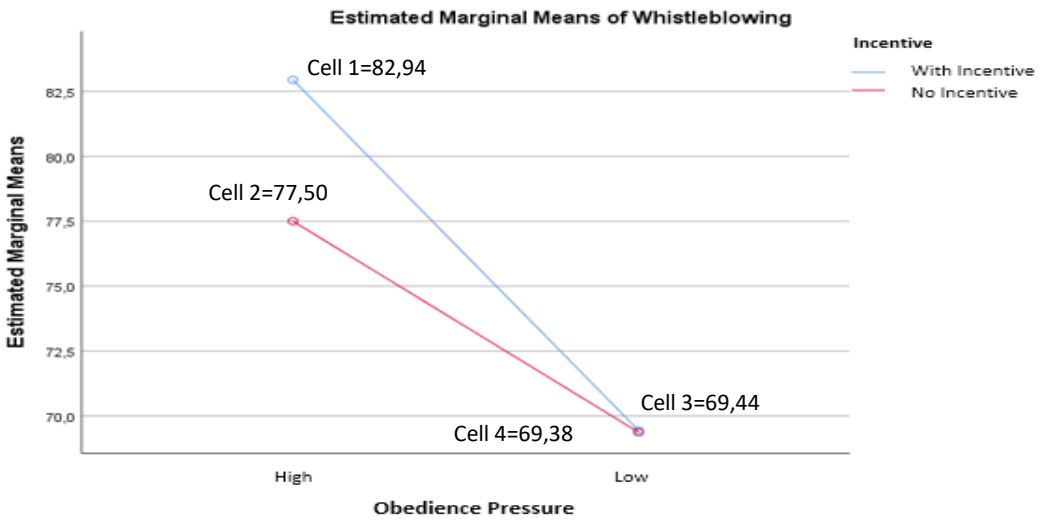

Figure 2 Obedience Pressure and Incentives Interaction Graph

Table 16 Summary of Hypothesis Testing Results

Hypothesis	Statement	Statistical Test Results	Conclusion
H1	*The subjects who are under low obedience pressure conditions will have a higher intention to take whistleblowing action than the subjects who are under high obedience pressure conditions.*	p=0.034	Supported
H2	*Incentives strengthen the tendency of the subject to take whistleblowing under high obedience pressure conditions.*	p=0.618	Not Supported

Hypothesis 1 explains that staff will be more willing to do whistleblowing when there is high obedience pressure than when obedience pressure is low. The two-way ANOVA test results reveal strong support for this assumption, with a p-value of 0.034 (<0.05). Furthermore, the average value of intention to whistleblower was found to be lower in high obedience pressure (mean = 80.30) than in low obedience pressure (mean = 69.41). This demonstrates that there is a difference in the inclination of staff in whistleblowing acts when there is high or low obedience pressure; hence, hypothesis 1 is supported.

The evidence for hypothesis 1 is consistent with an earlier study conducted by Setianto (2016), which indicates that the potential of whistleblowing is greater in settings of high obedience pressure than in conditions of low obedience pressure. When the head of the purchasing division puts high obedience pressure on employees, it puts them under pressure. It has an impact on their assessment of new suppliers to obtain new contracts. In cases where the head of the purchasing department stressed employees over the choice of suppliers that did not meet company standards, there was a loss of values and ethics held by the head of the purchasing division for the negative orders he gave. Due to the high pressure from these orders, employees will take whistleblowing action. Research by Libriani (2016) shows that, depending on the level of obedience pressure that arises in

the company, the intention to take whistleblowing action will be different. The intention to take whistleblowing action will be higher in situations with low obedience pressure. People who experience high obedience pressure do not dare to disclose fraud that occurs in the company. If someone knows that the boss is cheating, it makes them depressed and has a fear of telling others because of their power. Cahyaningrum's research (2017) states that the likelihood of whistleblowing is higher in low-obedience-pressure situations than in high-obedience-pressure situations. This hypothesis is in line with previous research by Cahyaningrum (2017); Gala, (2016); Libriani (2016); Nubatonis (2018); and Setianto (2016).

Hypothesis 2 states that incentives strengthen the tendency of the subject to take whistleblowing under high obedience pressure conditions. This hypothesis is not statistically supported by the One-Way ANOVA test, as shown in the Table 15, with a p-value of 0.618 > 0.05. Findings indicate that obedience pressure has a significant impact on whistleblowing intentions. The presence or absence of incentives does not affect a person in whistleblowing because, as a human being who is obedient and knows of a violation, he will definitely reveal the fraud without wanting any reward for his actions. This also agrees with the results of the interaction test, which can be shown in Figure 1. The graph proves that in a situation of high obedience pressure, staff tend to do whistleblowing when there are incentives or when there are no incentives. The function of incentives in motivating people to disclose misconduct is a contentious issue in the context of whistleblowing. A counterargument suggests that incentives may not always be an effective means of encouraging whistleblowing, despite the fact that others contend that giving rewards can drive whistleblowers. According to Mehrotra et al. (2020), companies may deter whistleblowing by offering rewards to staff members who keep quiet about financial irregularities. According to this viewpoint, the existence of incentives could put workers in a conflict of interest and influence their decision not to report suspicious activity. Furthermore, as Macgregor and Stuebs (2014) noted, whistleblower intentions might be tainted and challenged by powerful opposing motivations. This implies that people may make a more difficult and nuanced decision to come forward when faced with conflicting incentives. Furthermore, Dey et al. (2021) came to the conclusion that employees, in particular, may have little incentive to report wrongdoings because doing so could result in undesirable outcomes like being fired or facing retaliation. Teichmann and Falker (2020) also stressed that although financial incentives can support the motivations of whistleblowers, the size of these incentives matters because small incentives might not have a substantial impact on employees' internal ethical motivations and might even have the opposite effect. This implies that a number of variables, including the incentives' perceived value, affect how well they encourage whistleblowing. The results of this study are consistent with those of Pulungan et al. (2020), who stated that financial incentives have no effect on whistleblowing intentions. In addition, based on the characteristics of the respondents, the majority are men who have a bachelor's degree and have only worked for less than five years, so they are still idealistic and do not expect financial rewards (Pulungan et al., 2020). Thus, hypothesis 2 is not supported.

Conclusion

The purpose of this study is to provide empirical evidence for the analysis of the impact of obedience pressure on whistleblowing intention and the impact of incentives on whistleblowing intention. Findings indicate that staff under high obedience pressure from superiors are more likely to do whistleblowing rather than staff in low obedience pressure conditions. Staff who are under higher obedience pressure create pressure between the values or ethics adopted and negative orders from direct superiors. Employees who are in a position of lower obedience pressure are less likely to report whistleblowing. Incentives do not strengthen the positive effect of obedience pressure on whistleblowing intentions. When under high pressure, employees will still do whistleblowing in the presence or absence of incentives. Incentives can put employees in a difficult situation where employees may report fraud, but there are other risks, such as dismissal and retaliation. The implication of this research may contribute ideas for the prevention of whistleblowing. Since the result of the study is that the incentive cannot strengthen the influence of obedience pressure on the intention to do whistleblowing, organisations must consider another outcome for the staff when they decide to be whistleblowers, such as assurance of retaliation.

The limitations of this study are, first, it used student subjects as research participants. Thus, suggestions for further research can use more suitable subjects such as company employees or internal or external auditors. Second, the research instrument has yet to explicitly describe the amounts of incentives provided by the company to whistleblowers and only examines the role of incentives in moderating obedience pressure on whistleblowing intentions. The suggestion for future research is that the researchers need to get the data about the range of incentive amounts given to the whistleblower so that the experiment scenario can describe the real condition. Future research is expected to explore other factors that can influence whistleblowing, such as the state of the work environment and the seriousness of fraud.

References

Association of Certified Fraud Examiners (ACFE). (2022). *Fraud 101: What is fraud?*

Ayem, S., & Rumdoni. (2021). Pengaruh penalaran moral, retalisasi, religiusitas, dan gender terhadap niat mahasiswa melakukan tindakan whistleblowing (Studi empiris pada mahasiswa akuntansi Universitas Sarjanawiyata Tamansiswa). *AKURAT Jurnal Ilmiah Akuntansi FE UNIBBA, 12*(2), 150–164. Retrieved from https://ejournal.unibba.ac.id/index.php/akurat/article/view/593

Cahyaningrum, C. D. (2017). Whistleblowing: Studi eksperimental dalam kejujuran dan tekanan ketaatan. *Journal of Accounting and Management Innovation, 1*(2), 143–158.

Cahyaningrum, C. D., & Utami, I. (2015). Do obedience pressure and task complexity affect audit decision? *Jurnal Akuntansi dan Keuangan Indonesia, 11*(1), 92–105. https://doi.org/10.21002/jaki.2015.06

Chen, C. X., Nichol, J. E., & Zhou, F. H. (2017). The effect of incentive framing and descriptive norms on internal whistleblowing. *Contemporary Accounting Research, 34*(4), 1757–1778. https://doi.org/10.1111/1911-3846.12325

Chotimah, C., & Kartika, A. (2018). Pengaruh gender, tekanan ketaatan, kompleksitas tugas, dan pengalaman auditor terhadap audit judgment. *Dinamika Akuntansi Keuangan dan Perbankan, 6*(1). Retrieved from https://www.unisbank.ac.id/ojs/index.php/fe9/article/view/5950

Cooper, D. R., & Schindler, P. (2014). *Business research methods.* McGraw-Hill.

Denis, D. J., Hanouna, P., & Sarin, A. (2006). Is there a dark side to incentive compensation? *Journal of Corporate Finance, 12*(3), 467–488. https://doi.org/10.1016/j.jcorpfin.2005.08.006

Dey, A., Heese, J., Pérez-Cavazos, G., & School, H. B. (2021). Cash-for-information whistleblower programs: Effects on whistleblowing and consequences for whistleblowers. https://doi.org/10.1111/1475-679X.12370

Eaton, T. V., & Akers, M. D. (2007). Whistleblowing and good governance. *The CPA Journal, 77*. Retrieved from www.universityofcalifornia.edu/aboutuc/Whistleblower.html

Gala, P. (2016). Studi eksperimental atas whistleblowing: Pengaruh tekanan ketaatan dan dilema etika. Retrieved from https://repository.uksw.edu/handle/123456789/21823

Jamilah, S., Fanani, Z., & Chandrarin, G. (2007). Pengaruh gender, tekanan ketaatan, dan kompleksitas tugas terhadap audit judgment. In *Simposium Nasional Akuntansi X*. Makassar.

Lee, G., & Fargher, N. (2013). Companies' use of whistle-blowing to detect fraud: An examination of corporate whistle-blowing policies. *Journal of Business Ethics, 114*(2), 283–295. https://doi.org/10.1007/s10551-012-1348-9

Libriani, E. W. (2016). Studi eksperimental tekanan ketaatan dan personal cost: Dampaknya terhadap whistleblowing. *Jurnal Akuntansi dan Bisnis, 15*(2), 106–119. https://doi.org/10.20961/jab.v15i2.181

Macgregor, J., & Stuebs, M. (2014). Whistle while you work: Whistleblowing in the presence of competing incentives and pressures. *Accounting Perspectives, 13*(4), 309–324. https://doi.org/10.1111/1911-3838.12038

Mehrotra, S., Mishra, R. K., Srikanth, V., Tiwari, G. P., & Kumar, E. V. M. (2020). State of whistleblowing research: A thematic analysis. *FIIB Business Review, 9*(2), 133–148. https://doi.org/10.1177/2319714519888314

Milgram, S. (1963). Behavioral study of obedience. *The Journal of Abnormal and Social Psychology, 67*(4), 371-378. https://doi.org/10.1037/h0040525

Milgram, S. (1974). *Obedience to authority: An experimental view.* The New York Times. Retrieved from https://www.nytimes.com/1974/01/13/archives/obedience-to-authority-an-experimental-view.html

Nahartyo, E. (2012). *Desain dan implementasi riset eksperimen.* Yogyakarta: UPP STIM YKPN.

Nahartyo, E., & Utami, I. (2016). *Panduan praktis riset eksperimen.* Jakarta: PT. Indeks.

Nubatonis, G. A. S. (2018). Pengaruh profesionalisme auditor, tekanan ketaatan, lingkungan etika dan personal cost terhadap intensi melakukan whistleblowing: (Studi pada Kantor Akuntan Publik di wilayah Semarang dan Solo). Retrieved from https://repository.uksw.edu/handle/123456789/22866

Picaully, M. R. (2018). Pengaruh kepercayaan pelanggan terhadap niat pembelian gadget di Shopee Indonesia. *Jurnal Manajemen Maranatha, 18*(1), 31–40. https://doi.org/10.28932/jmm.v18i1.1094

Potipiroon, W. (2024). Reward expectancy and external whistleblowing: Testing the moderating roles of public service motivation, seriousness of wrongdoing, and whistleblower protection. *Public Personnel Management, 53*(2), 309–345. https://doi.org/10.1177/00910260231222814

Pulungan, A. H. (2018). Pengaruh religiusitas dan insentif keuangan terhadap intensi melakukan whistleblowing pada faith-based organization. *Jurnal Ekobis, 5*(1), 70–83. https://doi.org/10.35590/jeb.v5i1.682

Pulungan, A. H., Afriani, I., & Hasudungan, A. (2020). Apakah insentif keuangan dan persepsi keseriusan berpengaruh terhadap keputusan aparatur sipil negara melakukan whistleblowing? *Jurnal Akuntansi Aktual, 7*(1), 1–10. https://doi.org/10.17977/um004v7i12020p1

Putu, N., Parianti, I., Suartana, W., Dewa, I., & Badera, N. (2016). Faktor-faktor yang mempengaruhi niat dan perilaku whistleblowing mahasiswa akuntansi. *E-Jurnal Ekonomi dan Bisnis Universitas Udayana, 5*(12), 4209-4236.

Sari, D. I., Ruhiyat, E., Akuntansi, P., Ekonomi, F., Pamulang, U., Selatan, T., & Id, H. C. (2017). Locus of control, tekanan ketaatan, dan kompleksitas tugas terhadap audit judgment. *Jurnal Aset (Akuntansi Riset), 9*(2), 23-34. https://doi.org/10.17509/jaset.v9i2.9230

Setianto, V. Y., Utami, I., & Novianti, S. (2016). Whistleblowing dalam Tekanan Ketaatan dan Kepercayaan pada Pimpinan. *Jurnal Ekonomi dan Bisnis, 19*(3), 485–510. https://doi.org/10.24914/jeb.v19i3.607

Teichmann, F. M., & Falker, M. C. (2020). Whistleblowing incentives. *Journal of Financial Crime, 28*(2), 394–405. https://doi.org/10.1108/JFC-10-2019-0132

Teichmann, F. M. J. (2019). Incentive systems in anti-bribery whistleblowing. *Journal of Financial Crime, 26*(2), 519–525. https://doi.org/10.1108/JFC-04-2018-0041

Vandekerckhove, W., & Phillips, A. (2019). Whistleblowing as a protracted process: A study of UK whistleblower journeys. *Journal of Business Ethics, 159*(1), 201–219. https://doi.org/10.1007/s10551-017-3727-8

Vroom, V. H. (1964). *Work and motivation.* Wiley.

Wardani, D. K., & Agung Kalli Ngara, A. A. (2022). Pengaruh pertimbangan etis terhadap perilaku mahasiswa akuntansi untuk melakukan tindakan whistleblowing. *JISMA: Jurnal Ilmu Sosial, Manajemen, dan Akuntansi, 1*(3), 315–320. https://doi.org/10.59004/jisma.v1i3.85

Wardani, D. K., & Farin, I. (2023). Niat melakukan whistleblowing kecurangan akademik: Moralitas individu dan pemahaman tri pantangan. *Jurnal Ilmiah Universitas Batanghari Jambi, 23*(1), 276–285. https://doi.org/10.33087/jiubj.v23i1.3287

Wardani, D. K., Primastiwi, A., & Hanisah, H. (2021). Fraud prevention of government procurement of goods and services in local government. *Jurnal Akuntansi, 25*(2), 256–275. https://doi.org/10.24912/ja.v25i2.809

Wardani, D. K., & Saputri, C. A. D. (2023). Pengaruh fraud diamond dan penerapan tri pantangan Tamansiswa terhadap perilaku kecurangan akademik mahasiswa. *JIIP-Jurnal Ilmiah Ilmu Pendidikan, 6*(6), 4450–4457. https://doi.org/10.54371/jiip.v6i6.1805

Wijayanti, D. M., & Yandra, F. P. (2020). The role of incentives, emotional connection, and organizational justice in establishing an effective whistleblowing system: An experimental study. *Jurnal Dinamika Akuntansi dan Bisnis, 7*(1), 51–68. https://doi.org/10.24815/jdab.v7i1.14178

About the Authors

Fuadhillah Kirana Putri, S.Ak., M.Sc. (F.K.P.) - is a lecturer of Accounting Department, Faculty of Economics, Universitas Sarajanawiyata Tamansiswa, Yogyakarta 55167. Special Region of Yogyakarta, Indonesia. Email: Fuadhillah.putri@ustjogja.ac.id

Dr. Dewi Kusuma Wardani, S.E., S.Psi., M.Sc., Ak., CA, CRM, BKP, ACPA (D.K.W.) - is a lecturer at the Faculty of Economics, Universitas Sarajanawiyata Tamansiswa, Yogyakarta 55167. Special Region of Yogyakarta, Indonesia. Email: dewi.kusuma@ustjogja.ac.id

Adam Damara (A.D.) - is a student of Accounting Department, Faculty of Economics, Universitas Sarajanawiyata Tamansiswa, Yogyakarta 55167. Special Region of Yogyakarta, Indonesia. Email: adamdamara999@gmail.com

Author Contributions

Conceptualisation, F.K.P. and D.K.W.; Methodology, F.K.P. and D.K.W.; Investigation, F.K.P. and A.D.; Analysis, F.K.P. and A.D.; Original draft F.K.P.; Review and editing, F.K.P. and D.K.W.; Visualization, A.D.

Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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