

Group support system and explanatory feedback: An experimental study of mitigating halo effect

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ABSTRACT

Comprehensive assessment potentially leads to halo effect that will affect accuracy of auditors' decision-making process. Biased initial audit decision will potentially influence final audit decision. It is therefore necessary to mitigate halo effect that is the consequence of auditors' good impression on clients' initial condition. This research aims to empirically show that halo effect can be mitigated by explanatory feedback and Group Support System (GSS). The researchers experimentally manipulate explanatory feedback and GSS using online web-site. The subjects are students who have already taken auditing courses. The results show that: 1) explanatory feedback can mitigate halo effect so that audit decision will be more accurate 2) GSS can also mitigate halo effect 3) explanatory feedback and GSS are the best methods to mitigate halo effect.

ABSTRAK

Penilaian dengan perspektif menyeluruh berpotensi pada munculnya halo effect yang mempengaruhi akurasi pengambilan keputusan auditor. Keputusan audit pada tahap awal yang dipengaruhi oleh bias berpotensi pada keputusan akhir audit. Untuk itu efek halo yang muncul karena terkesan pada kondisi awal klien perlu dimitigasi. Riset ini bertujuan memberi bukti empiris bahwa efek halo dapat dimitigasi dengan metode pembelajaran berupa balikan eksplanatori dan dengan diskusi berbasis sistem (Group Support System/GSS). Desain penelitian menggunakan metode eksperimental dengan manipulasi berupa balikan eksplanatori dan GSS dengan bantuan website daring. Subjek penelitian yaitu mahasiswa yang sudah mengambil mata kuliah Pengauditan. Hasil penelitian menunjukkan bahwa: 1) Balikan eksplanatori mampu memitigasi bias halo sehingga keputusan audit menjadi lebih akurat, 2) GSS merupakan metode yang juga mampu memitigasi efek halo. 3) Balikan eksplanatori dan GSS merupakan metode paling baik dalam memitigasi efek halo.

1. INTRODUCTION

In order to determine client's business risk, an auditor needs to have a good understanding of client's business activities by developing a holistic perspective of risk-based audit (Bell et al. 2002). In this case, an analytical procedure is a mandatory component of an audit (Biggs, Mock & Watkins 1988) and critical in risk-based audit (Bell et al. 1997; Eilifsen, Knechel & Wallage 2001). For example, in the planning phase of analytical procedure, an auditor should develop preliminary hypothesis to identify the causes of fluctuation of client's financial data (Koonce 1993).

Failure to develop preliminary hypothesis may lead to inaccurate judgment in the final stage (Bedard & Biggs 1991). Data ambiguity (which consists of data sufficiency and complexity) is the main cause of inaccurate preliminary hypothesis (Luippold & Kida 2012). Data sufficiency denotes to the completeness of information while data complexity refers to the amount of available information (Hogarth and Einhorn 1992). Complex and sufficient data enables auditors to establish more accurate professional judgment (Luippold & Kida 2012). More complex data requires more sophisticated cognitive

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process in order to eliminate inaccuracies of preliminary hypothesis development. Complex data refers to information with holistic scope. Holistic data assessment enables auditor to gain better understanding of client's business. Furthermore, the use of holistic perspective helps auditor identify factors that potentially threaten client's business (Eilifsen, Knechel & Wallage 2001; Fukukawa & Mock 2011; Ballou, Earley & Rich 2004).

The halo effect in audit context is empirically demonstrated by O'Donnel & Schultz (2005), Grammling et al. (2010), Utami et al. (2012), Utami & Wijono (2014). In addition, the empirical literature shows that the halo effect on auditor decision making could be affected by holistic perspective developed by auditor (O'Donnel and Schultz 2005) or overall information that is not directly related with audited evidence (Grammling et al. 2010). In their experimental study, Utami et al. (2012) empirically demonstrate that convincing client appearance led to inaccurate decision making on risk of material misstatement. Utami & Wijono (2014) confirm that halo effect emerged when a set of information was presented as a chart. Such effect created high level of impression that eventually led to inaccurate decision-making. Gric (2008) argues that primacy effect could explain halo effect because primacy effect weighted preliminary information as the basis of decision-making. However, literature on decision-making model based on halo effect is still inconclusive, while the role of primacy effect on halo effect can be explained with belief revision model.

Cooper (1981b) argues that there are some approaches to mitigate halo effect, such as statistical control, training, increasing familiarity using ranks, grouping of ranks, groupings of irrelevant category, and ranking after observation and review. Training is the most appropriate in the audit context. For novice auditors, training equips them with complex analytical skills (Earley 2001). This is also in line with the first general auditing standard that asserts that auditor must have sufficient level of technical training and skills to audit. Earley (2001) asserts that training is an explanatory feedback method.

Decision making using holistic perspective could produce halo effect. Client appearance with strong impression at preliminary stage triggers halo effect and, if it is associated with primacy effect, can be explained by belief adjustment model (Hogarth & Einhorn 1992; Ashton &

Ashton 1988; Kennedy 1993; Pinsker 2011). Halo effect could produce inaccurate audit decision.

In practice, audit decisions are not made by individuals, but by groups. Additionally, information technology also supports group-based decision making as a communication mode or commonly called Group Support System (GSS). GSS is a computer-based decision support system that combines communication, computer, and decision technology to support formulation and solution of ill-structured problems (Briggs, Numanaker and Sprague 1998).

Nahartyo & Utami (2014) use GSS and transformational leadership type to modify rationalization of individual decision making from individual self-oriented one to the one that prioritizes organizational interests. GSS helps individuals to alter their decisions. One of the causes of inaccuracy of decision making is halo effect, and GSS can enhance accuracy of audit decision. Consequently, this research is motivated to propose GSS as a method to debias halo effect.

Another motivation of this research is to test the results of previous research (Utami 2013) that proposes explanatory feedback to mitigate halo effect. The previous research (Earley 2001, 2003) provides empirical evidence that explanatory feedback can enhance audit decision. Explanatory feedback is a review given by work team leader containing important information that has to be considered by decision makers. Utami (2013) empirically supports that explanatory feedback, but not self-explanation, can mitigate halo effect. According to Utami (2013), explanatory feedback was provided in the form of managers' review and presented in written form as audit decision on misstatement of sales account. In practice, provision of computer-assisted explanatory feedback is faster, more effective, and more efficient. This research again proposes combination of explanatory feedback and GSS to mitigate halo effect. Therefore, this research is a replication of previous research (O'Donnel and Schultz 2005; Grammling et al. 2010, Utami et al. 2013, Utami 2013, Utami and Wijono 2014) by providing empirical evidence of the existence of halo effect in audit decision and expands previous research by proposing GSS and computer-assisted explanatory feedback to mitigate halo effect.

In general, this research aims to develop a model to mitigate halo effect in the audit context by modifying belief revision model that has been previously tested using GSS and explanatory feedback. More specifically, this research aims to:

(1) provide empirical evidence that GSS could mitigate halo effect, (2) provide empirical evidence that explanatory feedback could mitigate halo effect, (3) test the interaction effect between explanatory feedback and GSS to mitigate halo effect.

Theoretically, it is expected that this research contributes in developing a model to mitigate halo effect by developing explanatory feedback training and GSS. Professionally, this research contributes to practicing the methods that can be applied in an audit firm by practicing explanatory feedback support by GSS. Methodologically, the researchers contribute to the existing literature by using internet-based experiment that has never been used in previous halo-effect studies.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

Group Support System

Lynch et al. (2009) found that using GSS in decision-making process produces social pressure and the effect. The experimental result from Jongsawat & Premchaiswadi (2011) shows that group attention on information positively affects the expectation of groups to perform better and to commit more in performing group tasks. Kerr and Murthy (1994) found that individuals working at GSS-based group have opportunity to learn more than those of face-to-face group. Arnold et al. (2000) empirically show that decision-making process using GSS is better than individual one. Further, Murthy and Kerr (2003) argue that performance of GSS-based leader is associated with parallel communication.

Murthy and Kerr (2004) and Kerr and Murthy (2004) investigate the effect of type of computer-mediated communication (as a part of GSS) in various assignments on the quality of group assignment. Their findings indicate that computer-mediated, face-to-face groups have below-the-standard performance when problem solving is an indicator of performance. During negotiation process, GSS also protects participants to develop commitment from actions that will be performed. GSS facilitates retention from negotiated social pressure and provides more opportunity to share cognition on substantive issues (Ackermann & Eden 2011).

Halo Effect and GSS

Group can be defined as a collection of individuals that more specifically consists of more than

four individuals (Birnberg 2011). Jessup et al. (1990) asserts that individual's in-group act as group members. Individuals may exhibit behaviors that are not usually shown. Ho (1999) argues that group discussion offers incentives for group members to rely on more significant cognitive efforts in order to provide more sophisticated explanations on related issues.

The literature concludes that individuals do not rely on their own decisions in changing behavior and judgment. Group effect usually increases polarized decision towards the end of decisions of group members (Reyniers & Bhalla 2013; Carpenter, Reimers & Fretwell 2011; El-Shinnawy 1998).

Schultz & Reckers (1981) denotes that theory is diffusion of responsibility theory indicates the direction of a result is dictated by the dominant preference in a group or society since individuals tend to shift responsibilities from individual domain towards group's one. Nahartyo and Utami (2014) stated that individuals change their behavior in groups due to pressure of social influence. Their experimental research shows that GSS altering the individual value (self-interest) and social preferences are guiding motivational factors of individual behavior. GSS has capacity to change group decision-making process. Ho (1999) confirms that GSS could encourage individuals to consider factors that may be neglected when making individual decisions. Accordingly, being influenced by halo effect, the negative influence of such effect will be mitigated when individuals are in groups. Based on the previous arguments and literature, we propose the following hypothesis.

H1: Subjects who experience halo effect will produce more accurate audit decisions with GSS than without GSS.

The Relationship between Halo Effect and Explanatory Feedback

Bedard & Biggs (1991) show that errors that often occur during analytical procedure phase influence preliminary hypothesis. Asare & Wright (2003) indicate that accurately determining preliminary hypothesis during analytical procedure phase increases auditors' ability to detect errors in client's financial statement. During this stage, halo effect affects the accuracy of professional judgment when auditors are faced with detailed evidence. Grammling, O'Donnel & Vandervelde (2010) emphasize the necessity to mitigate halo effect in order to increase the quality of auditors'

professional judgment. Kennedy (1995) explains a framework to reduce bias by using training or memory refreshment as an internal data mitigation method and decision support tool as an external data mitigation method. Training with corrective feedback could mitigate halo effect (Cooper 1981b).

Balzer & Slusky (1992) found that feedback is instrumental for increasing accuracy of decision-making process. The audit managers' review on clients' case can serve as decision support tool to mitigate halo bias.

Most psychology studies on learning use assignment examples that are similar to problems in textbooks. The examples are well structured; have objective answers, and solution procedures that are widely acceptable and modeled into examples. However, Bonner & Walker (1994) show that using explanatory feedback and rule understanding enable us to apply studies using well-structured settings on audit setting with ill-structured assignment by explaining to auditors why correct answers on certain cases enable them to obtain procedural knowledge.

Earley (2001) provides empirical evidence auditors who are provided with explanatory feedback have better professional judgment than auditors who do not receive explanatory feedback. Since halo effect affects professional judgment, knowledge acquisition as a training method with explanatory method will increase the quality of professional judgment, leading to halo effect mitigation.

Representativeness heuristic can explain halo effect bias as a result of individuals' constraint in processing information. Individuals tend to rely more on sets of information that have high degree of similarity to other sets of information. In order to overcome the bias, Bazerman (1994) emphasize the necessity of searching process that converts *status quo* individual decision-making process in terms of outcomes. In knowledge acquisition method with explanatory feedback, individuals will have additional information that can weaken strong perception that has already been strongly attached to memory. Consequently, halo effect in audit decision-making can be mitigated. Based on the previous arguments and literature, we propose the following second hypothesis:

H2: Subjects who experience halo effect will produce more accurate audit decisions when receiving explanatory feedback than those who do not receive.

The Relationship between Presentation of Client Profile, Halo Effect, and Sequence of Information Presentation

Research shows that using GSS in decision making process creates social pressure and influence (Lynch et al. 2009). Jongsawat and Premchaiswadi (2011) argue that the effects can increase group attention on web-based information in GSS. Their experiment shows that under GSS, group attention on information has positive effect on group members' expectation to perform better and to commit to solve problems in groups.

Kerr and Murthy (1994) find that individuals working in GSS-based groups have better learning opportunity than those working in groups that rely on face-to-face discussion. Arnold et al. (2000) show that decision-making using GSS is better than individual decision making. Murthy and Kerr (2003) argue that leaders' performance based on GSS is broadly associated with parallel communication.

Murthy and Kerr (2003) and Kerr and Murthy (2004) investigate the effect of computer-mediated communication type (part of GSS) in various assignments on the quality of group decisions. Their findings show that face-to-face interaction in computer-mediated group has below-the-standard performance when problem solving is an indicator of performance. In the context of negotiation, Ackermann and Eden (2011) find that GSS can protect negotiating participants to develop commitment from actions that will be performed. With the support of explanatory feedback and GSS, audit decision will be more accurate. Accordingly, the third hypothesis shows interaction between GSS and explanatory feedback as follows:

H3: GSS and explanatory feedback are the best methods to increase accuracy of audit decisions.

3. RESEARCH METHOD

Experimental Methods

Experimental research aims to test causal relationship between variables of interest, and not to generalize result. Yin (2014: 21) suggests that experiment method is purported to generalize theory and not to generalize sample in population. The main advantage of experiment is high internal validity (Shadish, Cook and Campbell 2012). Consequently, we believe that conducting two experiments in two different cities does not pose a serious problem. We randomly selected subjects from accounting students of two A-rated accounting departments from two Indonesian

Table 1
Participants' Demographic Characteristics

		Total	%
Sex	Female	76	37.3
	Male	72	39.4
GPA	2,5 - 3	16	8.3
	>3 - 3.25	30	15.5
	>3,25 - 3.5	48	24.9
	>3.5	54	28

Table 2
Results of Test Randomization Effectiveness

		Sum of Square	df	Mean Square	F	Sig
Sex	Between groups	9.820	45	0.218	0.820	0.770
	Within groups	27.153	102	0.266		
	Total	36.973	147			
GPA	Between groups	15.970	45	0.180	1.147	0.282
	Within groups	24.049	102	0.157		
	Total	133.782	147			
Basic Audit Understanding	Between groups	133.782	45	2.973	1.1296	0.142
	Within groups	233.968	102	2.294		
	Total	367.750	147			

higher institutions (SWCU Salatiga and STIE Perbanas) who have taken auditing course. We randomized subjects using the computer aid. The results show that subjects' decision between Surabaya and Salatiga is not significantly different, enabling us to use data from both cities together to test the hypotheses.

The researchers used accounting students as auditors surrogate because the objective of experimental methods is to test causal relationship of variables. Libby et al. (2002) in financing experimental research stated that participants of experiment can use non professional investor only require participants that have basic accounting and investing knowledge. Elliot et al (2007) suggest that students are a good proxy for nonprofessional investors in task that are relatively high in integrative complexity.

Student can act as auditor if the audit engagement does not use experience and professional judgment, like fraud decision, going concern opinion. Student accept an engagement of audit decision about internal control that an engagement for junior auditor.

The researchers use 2×2 mixed design (between-within subject) factorial, with factor is training method (explanatory feedback and no

explanatory feedback) and the within subject is method of decision making (before GSS and after GSS).

Operational Definition and Measurement of Variables

The researchers operationally define and measure the variables. Training method is a learning method with explanatory feedback that is a form of supervisors' feedback on certain cases to be learnt by their audit team members. Mode of decision making is a method of decision-making (before and after GSS). Audit decision is auditors' judgment in internal control evaluation 10 (very bad) until 100 (very good).

Experimental Process

The researchers first developed the research instrument that would be pretested on students until we obtain instruments that can manipulate subjects based on the intended variables. After having research instrument with high level of internal validity, we then test (web-based) the research instrument on practicing auditors.

Analytical Techniques

The researchers first display descriptive sta-

Table 3
Results of Test of Hypothesis 1

	Mean	Std. Dev	t	df	sig
Before GSS	72.993	14.110	13.604	147	0.000
After GSS	51.371	15.102			

Table 4
Results of Test of Hypothesis 2

	Mean	Std. Dev	t	df	sig
Before Explanatory Feedback	43.558	14.807	-12.504	146	0.000
After Explanatory Feedback	73.760	14.539			

Table 5
Results of Test of Hypothesis 3

	Mean	Std. Dev	t	df	sig
Explanatory Feedback + GSS	43.922	12.383	-4.919	146	0.000
No Explanatory Feedback +GSS	57.281	15.632			

tistics of subjects' demographic characteristics. The researchers then use ANOVA to test the effectiveness of the subject randomization based on the manipulation and to test the hypothesis. More specifically, randomization test aims to ensure that only the manipulations, and not subjects' demographic characteristics, affect audit decision. Additionally, the test also aims to ensure that there is no significant effect of understanding on audit knowledge on audit decision. Randomization is considered to be effective when there is no difference in audit decision due to subjects' demographic characteristics or level of audit understanding. Meanwhile, manipulation check consists of three questions answered by subjects after manipulation. If subjects answer at least two out of three questions correctly, subjects are considered to pass the manipulation

4. DATA ANALYSIS AND DISCUSSION

From the 148 subjects, 51.4% of them are female and 48.6% are male. It is also shown that GPA interval of 3.50-4.00 has the most subjects. The descriptive statistics indicate that the gender proportion is relatively equal. It is also shown that participants have adequate accounting knowledge to participate in audit simulation (see Table 1).

The results indicate that audit decision based on participants' intra-subject demographic characteristics (sex and GPA) do not display significant difference. It is also shown that audit decision based on intra-subject basic audit understanding is not significantly different. Based on

the results, it can be deduced that the randomization is effective since audit decision is not affected by demographic factors but by manipulation given. The researchers detect halo effect after subjects learn about the client's profile as a furniture manufacturing company. It has a big plant, advanced production process and equipment, and elegant products that are targeted for export market. Halo effect is a bias that emerges because individuals relies on their positive impression on a particular object they assess that makes their assessment on other attributes of such object positive. After learning the client's profile, the researchers asked the subjects to answer three questions on initial assessment of client's management, distribution system, and financial performance. Participants can rate each item ranging from 10 (not good at all) to 100 (very good). The researchers found that the average score of subjects' initial assessments on client's condition are above 50, indicating the existence of halo effect (see Table 2).

The researchers then explained the task and role of subjects, and provide subjects with explanatory feedback manipulation in the form of information from audit manager that participants should not only base their decisions on client's convincing physical appearance but also on client's weakness, especially in human resources.

Test of First Hypothesis

The first hypothesis states that subjects experiencing halo effect will make more accurate audit decision when they have GSS than those without GSS. We empirically test this hypothesis

by comparing individual audit decision (before discussing with GSS) and audit decision after discussing with audit team using paired t-test because the subjects make audit decision consecutively (before and after discussion). The following Table 3 displays the results of the first test.

Before discussion, the mean value of audit decision is 72.993 while after discussion it is 51.371. The average score of 72.993 indicates high value of internal control of sales account. The high score is due to halo effect, causing subjects to disregard important aspects of internal control weakness. After discussing with GSS, subjects revise their decisions to 51.471 (lower than initial score of internal control). This condition indicates that decision on internal control assessment becomes more accurate because subjects notice other aspects that show weakness of internal control and high impression because halo effect can be mitigated. During discussion, subjects receive information that can affect their experience with halo effect.

After discussion, audit decision tends to reflect client's actual condition. GSS is a discussion method that allows parallel communication among group members. Computer-mediated communication has significant effect on group decision-making process (Bamber, Hill and Watson, 1998); Murthy and Kerr 2004). This research support Jessup, Connolly, and Tansik (1990) who argue that CMC provides structured environment that enables participants to interact simultaneously and raise ideas. This research supports Nahartyo and Utami (2014) that GSS is a method that can alter individual rationalization.

Test of Second Hypothesis

The second hypothesis suggests that subjects experiencing halo effect will make audit decision more accurately when they receive explanatory feedback. As it can be seen in Table 4, the results show that explanatory feedback can alter audit decision. The findings support Earley (2001; 2008) who empirically show that explanatory feedback improves audit decision. In the context of halo effect mitigation, explanatory feedback can alter bias experienced by subjects and improve decision to be more accurate.

Table 4 displays the average value of decision on internal control. Before the subjects receive explanatory feedback, the mean value is 73.760. Meanwhile, after explanatory feedback the mean value is 43.558. The higher pre-

explanatory-feedback value indicates that subjects assess that client has good internal control. Additionally, the higher score is due to halo effect, causing subjects to disregard aspects that signify client's internal control weakness. After receiving explanatory feedback from audit team leader, subjects alter their decision that client's internal control possesses significant weakness so that audit decision score becomes lower (43.558). This research supports Utami (2013), Utami et al. (2012) that halo effect can be mitigated by explanatory feedback. This research also confirms Cooper (1981) that halo effect can be mitigated by training method. Explanatory feedback method is an appropriate and efficient training method in audit. Earley (2001, 2003) reveals that in audit, explanatory feedback is an inexpensive method to enhance decision quality.

Test of Third Hypothesis

The third hypothesis argues that GSS and explanatory feedback are the best methods to increase the accuracy of audit decision. As can be seen at Table 5, the empirical results support the hypothesis.

Table 5 exhibits that score of audit decision on internal control when receiving feedback and GSS is low (43.992). This condition signifies that subjects receiving training on mitigation method make appropriate decision and impression on halo effect has been reduced. Before receiving training on mitigation method, subjects have higher value of audit decision on internal control (57.281). This condition shows that halo effect induces subjects to assess client's condition to be good while actually there is internal control weakness.

Furthermore, the findings support Earley (2001; 2008) and Murthy and Kerr (2003) who show that both explanatory feedback and GSS improve the accuracy of decision-making process. Improved decision quality will eventually mitigate halo effect. The evidence also support Chalos and Poon (2000) who argue that group performance will be better because group improve individuals' ability to share information. Banker et al. (1996) suggest that information sharing significantly increase employees' quality.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

The objectives of this research are to (1) provide empirical evidence that GSS could mitigate halo effect; (2) explanatory feedback could mitigate

halo effect and (3) test the interaction effect between explanatory feedback and GSS to mitigate halo effect. The motivation of this research is the literature on decision-making model based on halo effect is still inconclusive, and another motivation is to test the result of previous test about explanatory feedback as a method to mitigate halo effect.

This research provided the following empirical evidence. First, when halo effect exists because auditors are impressed by clients' appearance, explanatory feedback can mitigate halo bias and eventually increase the accuracy of audit decision. Second, GSS is a method that can mitigate halo effect. Third, explanatory feedback and GSS are the best methods to mitigate halo effect. This research has some limitations. First, we apply computer-based GSS in a relatively short time. Further research could develop GSS simulation in longer duration that is partitioned into several conversation parts. Second, decision-making is made individually after GSS. It is expected that further research could develop group decision-making simulation after GSS.

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