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**W.P. No.2015-03-14**  
March 2015

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## Selective Perceptions and Group Brainstorming: An Investigation of Auditors' Fraud Risk Assessment

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### Abstract

Individuals in an organizational context are routinely faced with complex problems that are not well defined and that challenge their cognitive capacities. To deal with such complex issues, decision-makers construct “belief-structures” which in turn create *selective perceptions* about information and events that prevent them from being overwhelmed by the amount and complexity of information. This study examines the impact of two important contextual variables; pressures and opportunities on auditors’ selective perceptions and fraud risk assessments. Research suggests that a situation relevant concept, norm, perspective, or cognitive process that is shared by a majority of the group members, will be exaggerated in a group setting where groups are trying to accomplish a task that does not have a normatively/demonstrably correct answer. In an audit setting, typically there are no normatively correct answers related to the weighting of different levels of pressures and opportunities while assessing fraud risk. Therefore we also examine how individual auditors’ selective perceptions affect group decisions. The results indicate that observed differences in individual auditors fraud risk assessments were significantly accentuated during group brainstorming. Thus, our findings suggest that, group brainstorming instead of reducing the influence of contextual characteristics on selective perception, actually accentuates that effect.

**Keywords:** Selective perception; group brainstorming; fraud detection; pressures; opportunities; attribution theory.

## SELECTIVE PERCEPTIONS AND GROUP BRAINSTORMING: AN INVESTIGATION OF AUDITORS' FRAUD RISK ASSESSMENT

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### INTRODUCTION

Perception is defined as a complex cognitive process by which individuals organize and interpret their sensory impressions in order to develop a unique picture of the world (Luthans, 2010; Robbins & Judge, 2013). Individuals in an organizational context are routinely faced with complex problems that are not well defined and that challenge their cognitive capacities. To deal with such complex issues, decision-makers construct “belief structures” that are cognitive structures representing organized knowledge about a given concept or type of stimulus and contain both the attributes of the concept and the relationships among the attributes (Fiske & Taylor, 1984; March & Simon, 1958; O’Reilly, 1983; Simon, 1955). Such belief structures create *selective perceptions* about information and events and prevent individuals from being overwhelmed by the amount and complexity of information (Daft & Wieck, 1984). However, what is perceived can be substantially different from objective reality. Recognition of the difference between this filtered, perceptual world and the real world is vital to the understanding of organizational behavior, which in turn has a significant effect on organizational processes and performance (Waller et al 1995; Luthans, 2013). The aim of the present study is to investigate and understand the impact of contextual determinants on selective perceptions of both individual decision makers and groups, and their implications for decision-making.

According to Statement on Auditing Standards (SAS) No. 99 (*Consideration of Fraud in a Financial Statement Audit*), pressures and opportunities are two major factors leading to fraudulent financial reporting<sup>1</sup>. Auditors are one of the primary deterrents of financial frauds. They play a significant role in reducing the opportunities available to commit fraud (Hogan et al., 2008). For example, auditors possessing greater experience and expertise allow companies to report relatively lower discretionary accruals (Becker et al., 1998;

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<sup>1</sup> Examples of pressures include earnings expectations, analyst and market expectations, need to raise capital through debt or equity at favorable terms etc. Examples of opportunities include weak governance structures, weak internal controls, complexity and geographical spread of business etc. For a more detailed list of pressures and opportunities please refer to SAS No. 99.

Francis et al., 1999; Carcello & Nagy, 2002; Knapp & Knapp, 2001). However, the auditors have no control over the external and internal competitive pressures on the organization's management to act aggressively, and to commit fraud. Since the auditors cannot control pressures on management but can surely exert some control over the opportunities to commit fraud, one would expect systematic and selective differences in the manner in which pressures and opportunities are perceived and evaluated by auditors. In the context of the above discussion, the study assesses the impact of contextual characteristics (pressure and, opportunities) on auditors' perception about the likelihood of fraud being committed by the management.

The second objective of this study is to examine the impact of group brainstorming, an audit procedure recommended by SAS No. 99, on auditors' perceptions of pressures and opportunities in a fraud risk assessment context. Psychology research has cited several reasons for improvement in performance due to brainstorming (Stasser, 1992; Davis, 1969; Laughlin, 1980; Stasser et al., 1989; Vollrath et al., 1989). On the other hand, research suggests that a situation relevant concept, norm, perspective, or cognitive process that is shared by a majority of the group members, could be exaggerated in a group setting (Hinsz et al., 1997; Hinsz et al., 2008; Robbins and Judge, 2013). Such findings hold particularly in scenarios where groups are trying to accomplish a task that does not have a normatively or demonstrably correct answer (Mugny & Perez 1991; Laughlin & Ellis 1986). In an audit setting, typically there are no normatively correct answers related to the weighting of different levels of pressures and opportunities while assessing fraud risk. It is likely that if individual auditors share a selective perception it could be exaggerated in a group setting rather than being mitigated. Therefore, we investigate if brainstorming in groups exaggerates the differences observed in individual auditors' efforts while assessing fraud risk. Of concern is the issue of whether differences observed in decision-makers' evaluations of pressures and opportunities increase as a result of team brainstorming.

We conducted an experiment using a 2x2x2 repeated measures design in which pressures and opportunities were manipulated at high and low levels, and brainstorming occurred individually and then later in three member audit teams. The results of our study indicate that auditors assessed a significantly higher fraud risk and audit effort when they observed high pressures with low opportunities compared to when they observed low pressures with high opportunities. Furthermore, these differences were significantly increased when they performed group brainstorming. Thus, our findings suggest that auditors selectively perceive

pressure to be a greater fraud risk factor compared to opportunity. Furthermore, group brainstorming instead of reducing the influence of contextual characteristics on selective perception, actually accentuates the effect and does not necessarily increase the auditors' sensitivity to fraud risk factors in all pressure/opportunity scenarios.

The study makes significant contribution to theory and practice. First, we contribute to the organizational behavior literature by delineating the role of important situational factors on perceptions, and on decision making processes. Second, the study contributes to literature on groups by showing how group brainstorming may accentuate the decisions taken by individuals in situations when there are no definite correct or wrong answers. Third, the study contributes to accounting literature by testing the conceptualized relationships in an accounting (fraud assessment) context.

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### 1.1 Selective Perception

Decision making in an organizational context is seldom normatively rational (Mintzberg et al., 1976). Such decision making is constrained by the limitations in information processing capabilities of the individuals making these decisions (Lyles, 1981; Mason & Mitroff, 1981; Starbuck & Hedberg, 1977; Andersen & Paine, 1975). According to Walsh and Fahey (1986), decision makers form certain simplifying assumptions and theories which are also called belief structures which may act as “decision making blinders” (Walsh & Fahey, 1986, pp. 326). Such decision making blinders create selective perceptions about various organizational information and events (Walsh, 1988), thereby, facilitating decision making. For example, they reduce information processing demands by structuring experience (Bower et al, 1979), by facilitating information acquisition and retrieval (Cantor & Mischel, 1977), and by providing a basis for inference (Snyder & Uranowitz, 1978). However, these belief structures and perceptions could also adversely affect decision making processes. For example, they have the potential of defining an individual's domain of attention (Cohen & Ebbesen, 1979) restricting the encoding and retrieval of information (Ross & Sicol, 1979; Cantor & Mischel, 1977), and creating biases in the evaluation of information (Linville, 1982). In order to be effective and successful, decision-makers should not necessarily try to eliminate these perceptions and cognitive

structures, but to understand when and how such perceptions are formed, and learn how to employ them effectively.

Prior research indicates that several contextual factors such as a perceiver's work history (Bunderson & Sutcliffe, 1995), functional background (Waller, Huber & Glick, 1995), departmental identification (Beyer et al., 1997; Dearborn & Simon, 1958; Walsh, 1988) affect selective perceptions. Prior research also indicates that cognitive schemas are affected by exposure to a vocation (Neimeyer & Ebben, 1985; Neimeyer & Metzler, 1987; Neimeyer et al., 1987). Such changes in cognitive schemas could eventually affect selective perceptions related to a vocational task. There is limited research examining what decision-makers perceive as important in the context of their actual work environment (Koonce et al., 2005; Waller et al., 1995). Lack of this information may cause decision-makers to unknowingly fall prey to suboptimal information-processing strategies.

## 1.2 Pressures and Opportunities to Commit Fraud

Accounting standards (e.g., SAS No. 99) list pressures and opportunities as two major drivers of corporate fraud. There is ample evidence suggesting that managers make choices to manage earnings because of the *competitive pressures* exerted on them by various environmental or situational factors (for a detailed review see Hogan et al., 2008; Healy & Wahlen, 1999). There is also a strong relationship between internal control weaknesses, providing managers with greater *opportunities* to indulge in aggressive accounting (Hogan et al., 2008). For companies where frauds are discovered, usually there are significantly more weaknesses in governance structure than for companies where fraud is not discovered (Beasley et al., 2000; Caplan 1999). Prior research also indicates that companies that have managed earnings aggressively are more likely to eventually commit fraud (Perols & Lougee, 2011). Therefore, the presence of pressures and/or opportunities could be a significant factor that could lead to aggressive accounting and eventually to fraud.

However, there are some fundamental differences in the characteristics of pressures and opportunities that can lead to differences in the auditors' evaluation of pressures and opportunities while assessing fraud risk. For example, superior audit quality can act as a significant deterrent to commit fraud (Hogan et al., 2008). Prior research shows that Big 6 (presently Big 4) auditors are more effective in constraining managers' attempts to manage earnings through higher discretionary accruals compared to non-Big 6 auditors (Becker et

al., 1998; Francis et al., 1999). Similarly, Carcello and Nagy (2002) found a negative relationship between financial statement fraud and auditors' industry specific expertise. Knapp and Knapp (2001) found a positive relationship between audit experience and performance on analytical procedures aimed at detecting financial statement fraud. Furthermore, various auditing standards (such as SAS No. 99) and legislations (such as the Sarbanes-Oxley Act) have been introduced to improve the effectiveness and efficiency of the audit process, and to reduce the opportunities available to commit fraud.

However, the auditor has no control over the competitive pressures on the management to act aggressively or commit fraud. Such pressures are usually external to the organization and are generated by a complex set of economic, human, and environmental factors which in some cases are not observable by the auditors (see SAS No. 99 for a list of pressures; Daft, 2012). Additionally all the training that a typical auditor receives during his formative years is purely related to assessing and controlling the opportunities related to a company. For example course materials related to professional degrees such as the Chartered Accountant or the Certified Public Accountant will have modules on auditing best practices and internal control designs. However there are rarely any study modules that teach how to control or react to pressures related to a company. Accordingly, it can be inferred that the effects of opportunities to commit fraud can be assessed and controlled, relatively more easily than those related to pressures.

Prior research in accounting indicates that attribution theory (Jaspars et al. 1983; Eagly and Chaiken 1993) also affects auditors' decision making process (Glover et al 2008; Desai et al. 2011). A significant number of corporate frauds are driven by "pressures" created by competition and various types of market expectations. (e.g., Enron, WorldCom, HealthSouth, Parmalat etc.). Therefore, it is possible that auditors would attribute a relatively higher risk of fraud associated with pressures than opportunities.

Prior research indicates that individuals risk perceptions directly influence their decision making (Coombs 1975; March and Shapira 1987; Weber 1998; 2004) and that individuals' risk perceptions are significantly affected by the "controllability" of the perceived factors that affect the riskiness of any context (Slovic et al., 1981; Slovic 1987). Selective perceptions are used in an organizational context to deal with complex problems that are not well defined and which challenge individuals cognitive capacities (Judge et al., 2012; Mason & Mitroff, 1981; Schwenk, 1984; Walsh, 1988). In an audit setting, a fraud risk assessment task

is one of the most difficult and complex tasks, requiring complex cognitive processing (Knapp & Knapp, 2001; Eining, 1997; Pincus et al., 1989). Given the high cognitive processing needed during fraud risk assessment, selective perceptions about the importance of situational factors (pressures, opportunities) may help reduce the effort needed in the complex cognitive processing and in coming to a final decision quickly.

In line with the above argument, Koonce et al (2005) indicate that in complex decision making contexts investors rank factors perceived to be more controllable by management to be less risky than those perceived to be less controllable by management while assessing the company performance. We argue that there are differences in the characteristics of pressures and opportunities and also that the opportunities are relatively more controllable compared to pressures. Therefore these differences will selectively make the auditors perceive the relative riskiness of pressures to be higher than that of opportunities, while assessing the risk of fraud. Based on the above arguments, we hypothesize:

***H1a:*** *Individual auditors' fraud risk assessment will be higher in the presence of high pressures than in the presence of high opportunities.*

Additionally, research has shown that there is a positive correlation between the perceived risk of material misstatements in the financial statements and audit effort (Margheim, 1986; Gaumnitz et al., 1982; Schneider, 1985; DeZoort et al., 2001; Desai et al., 2011). We believe that if risk assessments are relatively high in the presence of high pressures than the assessed audit effort will be also be relatively higher in the presence of high pressures. Thus, we hypothesize:

***H1b:*** *Individual auditors' assessment of audit effort will be higher in the presence of high pressures than in the presence of high opportunities.*

### **Brainstorming and Selective Perceptions**

SAS No. 99 requires audit teams to brainstorm (both before and during the information-gathering process) about the potential presence of material misstatements in the financial statements due to fraud. The two primary objectives of brainstorming sessions are to improve understanding of the financial statements, and to set a skeptical tone for the overall audit engagement (Ramos, 2003; AICPA, 2002, 2003).

Psychology research has cited several reasons for improvement in performance due to brainstorming. For example, compared to individuals, groups have a greater probability of having more unique as well as common, information (Stasser, 1992). By aggregating the resources of several individuals, groups bring more



input as well as heterogeneity into the decision process (Judge et al., 2012). Moreover, multiple information processors in a group increase the probability that at least one member will have a correct solution to a problem (Davis, 1969). Even if a small subset of group members has some unique information it can help focus the whole group's attention on such information (Laughlin, 1980; Stasser et al., 1989; Vollrath et al. 1989). It is possible that group members correct each other's errors, thus increasing the probability of generating an optimal solution (Hill, 1982; Martell & Borg, 1993). Interaction among group members opens up the opportunity to consider more approaches and alternatives and can help in resolving implicit difference of opinions which, in turn, could improve decision quality (Sniezek, 1992). There has been limited research on the benefits of group brainstorming in the context of an audit. Carpenter (2007) found that brainstorming in groups leads to increase in auditors' risk assessments and audit effort while searching for potential frauds. Other research found that strategic reasoning and group brainstorming lead to the establishment of more effective audit plans (Hoffman & Zimelman, 2009), and that computer-mediated brainstorming was significantly more effective than traditional face-to-face brainstorming (Lynch et al., 2009).

However, group decisions have their drawbacks. A stream of research indicates that groups display more homogenous cognitive processes than their members. If individual members tend to process information with certain perspectives, cognitive processes, themes, dimensions, or features, then group members may tend to exaggerate the initial positions they hold (Hinsz et al., 1997; Hinsz et al., 2008). Similarly, if some information-processing tendency is uncommon among the members (or if some member is more influential in the group), groups typically further attenuate this uncommon tendency while processing information. Information weighted heavily by individual members of the group is weighted more heavily by the group as a whole, and information weighted relatively less by individual members of the groups is weighted even lesser by the overall group (Hinsz & Davis 1984). Tindale et al. (1996) indicate that groups will be attracted to response alternatives that fit the task representation that is shared by most or all of the group members. Karau and Kelly (1992) argued that restrictive time pressures also induced groups to focus on task completion; consequently, initial member preferences had more influence on group discussion and the final decision.

Prior research suggests that a situation relevant concept, norm, perspective, or cognitive process that is shared by a majority of the group members, will not be exaggerated in a group setting only if the task has a

normatively correct answer or a demonstrably correct answer (Mugny & Perez, 1991; Laughlin & Ellis, 1986). This is because a minority portion of the group can normatively argue in favor of the correct solution. However, in cases without a normatively correct solution, minority group members find it very difficult to argue against the views of the majority (Smith et al., 2000; Clark, 1990; Smith et al., 1998; Tindale et al., 1990; Tindale et al., 1993).

In an audit setting there are no normatively correct answers related to the effects of pressures or opportunities on assessment of fraud risk and audit effort. Moreover, the decision-makers' effort and fraud risk assessments could be different under different sets of pressures and opportunities. Additionally the audit teams are also under time pressure to complete their tasks. As a result, the task representation and related selective perceptions shared by the majority group members while assessing the effects of pressures and opportunities are likely to get reinforced. In other words, the differences observed in individual auditors' assessments of pressures and opportunities are expected to be exaggerated or enhanced in a group setting. Additionally, research has shown that there is a positive correlation between the perceived risk of material misstatements in the financial statements and audit effort (DeZoort et al., 2001; Desai et al. 2011). Based on the above discussion, we hypothesize:

- H2a:** *The observed difference in the individual auditors' fraud risk assessment in the presence of different levels of pressures and opportunities will be higher when auditors brainstorm in groups.*
- H2b:** *The observed difference in the individual auditors' assessments of audit effort, in the presence of different levels of pressures and opportunities, will be higher when auditors brainstorm in groups.*

## METHOD

### Participants

We got usable responses from a total of 168 Chartered Accountants located in 2 Indian states. We used a 2x2x2 between-subjects repeated measures design to test our hypotheses. The participants were randomly assigned to one of the four treatments where the pressures and opportunities were manipulated at two levels (high and low) and then they were asked to brainstorm about the perceived fraud risk affecting the company. The participants within each treatment were then randomly placed into groups of three and they were then

again asked to brainstorm about the perceived fraud risk associated with that particular treatment. The brainstorming treatment was repeated twice, once individually and once in groups of three each. All the data was collected during firm training sessions and feedback on the results was provided to the participating firms after the experiment was completed and results were tabulated. The participants reported an average experience of 3.08 years.

### **Materials and Procedures**

In the first phase of the experiment, participants were provided with a case containing a brief company description along with some information about the financial statements of the company. The different levels of pressures and opportunities were embedded in the brief company description. The “high” pressures on management were operationalized by the presence of aggressive bonus targets, and aggressive earnings targets set by board of directors and analysts. The “high” opportunities were operationalized by the wide geographic spread of the company, the presence of complex accounting transactions, presence of weak internal controls, and the importance of client to external auditor.<sup>2</sup> The high pressure/high opportunity treatment and the low pressure/low opportunity treatment represent control conditions (these are essentially the boundary conditions in the experiment). The other two treatments, high pressure/low opportunity and low pressure/high opportunity, are the treatments of greater interest. Therefore, the differences in the assessed fraud risk and audit effort for the high pressure/low opportunity & low pressure/high opportunity treatments will be analyzed to evaluate our hypotheses. At the end of the first phase individual participants were asked to complete two tasks. For the first task, participants were asked to evaluate the risk of pressures and/or opportunities leading to fraud and, for the second task the participants were asked to assess the fraud risk associated with the case and also assess the change in level of audit effort based on the reading of the case.

The second phase of the experiment consisted of the group brainstorming sessions. The participants in each treatment were formed into groups of three each and then they were asked to complete the before mentioned two tasks as a group. The responses to the “fraud risk assessment” and “change in audit effort” questions were used to answer the questions related to our hypotheses.

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<sup>2</sup>These pressures, opportunities, and the rating scale are similar to those in Apostolou et al. (2001), and Wilks and Zimbelman (2004) and this research as shown these pressures and opportunities to be significant fraud risk factors (additionally, these factors are also listed in SAS No. 99 as possible fraud risk factors)

## RESULTS

### Preliminary Analysis

The manipulation checks indicated that the participants on average were sensitive to the presence of pressures and opportunities embedded in the case.<sup>3</sup> The results suggest that the assessed level of pressure was 8.15 (on scale ranging from 0 through 10, with 0 indicating low pressure and 10 indicating high pressure) for the high pressure cases compared to 4.21 for the low pressure cases ( $t = 3.16, p < .05$ ). Similarly the assessed level of opportunity was 7.54 for the high opportunity cases compared to 3.65 for the low opportunity cases ( $t = 2.97, p < .05$ ). This suggests a successful manipulation of pressures and opportunities and also that the participants' responses were conditioned by the pressures and opportunities manipulated in each treatment.

As a preliminary analysis of the brainstorming individuals, a two-way ANOVA was calculated with the participants' fraud risk assessments as the dependent variable. The results indicate a significant Pressure x Opportunity as well as a significant main effect for pressure and opportunity (see table 2, panel A) on participants fraud risk assessments. An analysis of the before mentioned interaction indicates that there was a simple effect for level of opportunity (high versus low) at the low level of pressure. The low pressure/high opportunity group assessed significantly higher fraud risk (6.14) than the low pressure/low opportunity group (5.1). However, the simple effect for level of opportunity (high versus low) at the high level of pressure was found to be not significant (respective means are 7.40 and 7.21). These results suggest that the presence of high pressure on management (regardless of level of opportunity) results in a higher fraud risk assessment than the presence of low pressure on management (regardless of level of opportunity).

As expected the high pressure/high opportunity and low pressure/low opportunity treatments had the highest and lowest average fraud risk assessment (7.40 and 5.10, respectively). The fraud risk assessment for the high pressure/low opportunity and low pressure/high opportunity treatment means were 7.21 and 6.14, respectively. A paired-samples t-test was calculated to compare these two means (for the high pressure/low opportunity and low pressure/high opportunity treatment groups). This analysis indicates a significant difference between the high pressure/low opportunity and low pressure/high opportunity groups,  $t(41) = 5.61$ ;

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<sup>3</sup> The number of pressures and opportunities embedded in the experiment was derived after pilot testing and consultations with practitioners.

$p < .01$ . This result again indicates that auditor place relatively greater weight on pressures compared to opportunities while assessing fraud risk associated with a company. These results support H1a.

A two-way ANOVA was also calculated with the assessed audit effort as the dependent variable. The ANOVA analysis revealed a significant interaction effect between pressure and opportunity (see table 2, panel B), as well a significant main effect for pressure and opportunity on the proposed change in audit effort. Subsequent analysis of this interaction showed that there was a simple effect for level of opportunity (high versus low) at the low level of pressure. The low pressure/high opportunity group assessed significantly higher audit effort (2.81) than the low pressure/low opportunity group (1.26). However, the simple effect for level of opportunity (high versus low) at the high level of pressure was found to be not significant (respective means are 3.88 and 3.64). The pattern of means also indicated that the presence of high pressure on management (regardless of level of opportunity) results in a greater audit effort than the presence of low pressure on management (regardless of level of opportunity). These results support H1b.

**Table 1**  
**Mean Scores and Standard Deviations of Individuals and Groups**

Measure	Panel A (Individuals)				Panel B (Groups)			
	HP/HO (SD)	HP/LO (SD)	LP/HO (SD)	LP/LO (SD)	HP/HO (SD)	HP/LO (SD)	LP/HO (SD)	LP/LO (SD)
Fraud Risk Assessment	7.40 (1.13)	7.21 (.95)	6.14 (.65)	5.10 (.85)	8.21 (.70)	8.00 (.68)	6.00 (.68)	4.57 (.85)
Audit Effort	3.88 (.71)	3.64 (.73)	2.81 (.71)	1.26 (.80)	4.36 (.63)	4.31 (.72)	2.98 (.78)	.93 (.73)

HP/HO = High Pressure and High Opportunity;  
HP/LO = High Pressure and Low Opportunity;  
LP/HO = Low Pressure and High Opportunity;  
LP/LO = Low Pressure and Low Opportunity

**Table 2**  
**ANOVA Examining the Effects of Pressures and Opportunities (Individuals)**

Panel A: ANOVA, Fraud Risk Assessment				
Source	df	MS	F	p-value
Pressures (P)	1	120.02	144.78	< .01*
Opportunities (O)	1	16.09	19.14	< .01*
P x O	1	7.74	9.31	< .01*
Error	164	.82		
Panel B: ANOVA, Audit Effort				
Source	df	MS	F	p-value
Pressures (P)	1	1411.72	2611.85	< .01*
Opportunities (O)	1	125.15	231.54	< .01*
P x O	1	33.48	61.95	< .01*
Error	164	.54		

\*Significant at  $p < 0.05$

Supplementing this analysis, the responses from individual brainstorming treatment were analyzed to see if there was a difference between the high pressure/low opportunity treatment and the low pressure/high opportunity treatment. The related means and standard deviations are in table 1. For the control treatments high pressure/high opportunity and low pressure/low opportunity, the participants' indicated an effort level of 3.81 and 1.26 respectively. However, for the high pressure/low opportunity and low pressure/high opportunity treatments, the respective means were 3.64 and 2.81. A paired-samples t-test was calculated to compare these two means. This analysis revealed a significant difference between the high pressure/low opportunity and low pressure/high opportunity groups,  $t(41) = 5.48$ ;  $p < .01$ . These results provide further support in favor of H1b

### **The Effect of Brainstorming in Groups**

We conduct this analysis to observe if the differences in the individual auditors' assessment of fraud risk and audit effort would be accentuated in a group setting. In this analysis the group's response is considered to be the individual decision makers' response for the purpose of analyzing the results<sup>4</sup>. The first and second hypotheses suggest that differences observed in individual auditors fraud risk assessments and audit effort in the presence of different levels of pressures and opportunities will be significantly increased

<sup>4</sup> For example is the group responds "x" to a certain question each individual group member is assumed to have responded "x" to that question. As a result even though there were 14 groups per treatment in the group brainstorming phase the total number of responses are still  $14 \times 3 = 42$  per treatment.

when they brainstorm in groups. We conduct ANOVA and t-test analysis to examine if H2a and H2b were supported.

Results were analyzed using three-way ANOVA, with two between-group factors (pressure and opportunity) one repeated factor (individual and group brainstorming). Panel A of table 3 shows results for the fraud risk assessments. As the data show, the three-way interaction was not significant, ( $F(1, 326) = .72$ ;  $p = .39$ ). There is, however, a significant pressure x opportunity interaction, ( $F(1, 326) = 31.55$ ;  $p < .01$ ), and a significant pressure x group interaction, ( $F(1, 326) = 41.47$ ;  $p < .01$ ). This interaction is of interest because it provides support for H2a. Additional analysis discussed below further investigates the nature of this interaction and extends the hypothesis testing.

Panel B of table 3 shows results for the analysis which used the audit effort as a dependent variable in the three-way ANOVA. Similar to the results discussed above, the three-way interaction was not significant ( $F(1, 326) = 1.92$ ;  $p = .16$ ) while there was a significant pressures x opportunity interaction ( $F(1, 326) = 57.51$ ;  $p < .01$ ) and, a pressure x group interaction ( $F(1, 326) = 9.01$ ;  $p < .01$ ). This result provides support for H2b. We extend the analysis below for direct testing of the high pressure/low opportunity and low pressure/high opportunity treatments in the experiment (comparing individual brainstorming to group brainstorming).

**Table 3**  
**ANOVA Examining the Effect of Pressures, Opportunities and Group Brainstorming**

Panel A: Fraud Risk Assessment				
Source	df	MS	F	p-value
Pressures (P)	1	426.88	636.77	< 0.01*
Opportunities (O)	1	41.45	61.92	< 0.01*
Group (G)	1	3.97	5.94	.015*
P x O	1	21.26	31.55	< 0.01*
P x G	1	27.76	41.47	< 0.01*
O x G	1	.64	.97	.33
P x O x G	1	.48	.72	.39
Error	326	.67		
Panel B: Audit Effort				
Source	df	MS	F	p-value
Pressures (P)	1	354.24	679.38	< .01*
Opportunities (O)	1	79.07	151.65	< .01*
Group (G)	1	5.01	9.56	< .01*
P x O	1	57.51	110.28	< .01*
P x G	1	9.01	17.27	< .01*
O x G	1	.51	.97	.32
P x O x G	1	.99	1.92	.16
Error	326	.67		

\*Significant at  $p < 0.05$

We examined how the difference in auditors' responses to the most extreme treatments (difference between the HP/HO and LP/LO treatments in the "individual" versus "group" treatments) were affected by the group brainstorming. The means reported in Table 4 (Panel A) indicate that the difference in fraud risk assessments between the HP/HO and LP/LO treatments significantly increased from 2.30 to 3.64 ( $t = 4.98$ ,  $p < .01$ )<sup>5</sup>. A similar pattern was observed in the responses related to audit effort (2.62 versus 3.43;  $t = 3.69$ ,  $p < .01$ ). Next, we examine if group brainstorming in combination with high pressures or high opportunities exaggerates the differences between individual auditors and groups of auditors.

The means reported in Table 4 (Panel B) indicate that the difference in the participants' fraud risk assessments between the HP/LO and LP/HO treatments significantly increased from 1.07 (Table 4, Panel B) for the individual auditors to 2.00 for the groups ( $t = 2.75$ ,  $p < .01$ ). It is interesting to note that while there was no difference between the LP/HO (I=individuals) and LP/HO (G=groups) participants ( $t = 1.61$ ;  $p = .13$ ), the fraud risk assessments of the HP/LO (G) participants was significantly more than HP/LO (I) participants ( $t = 9.63$ ;  $p < .01$ ). These results provide evidence in support of H2a.

The means reported in Table 4 (Panel B) indicate that, the difference in assessed audit effort, between the HP/LO and LP/HO treatments significantly increased from .83 for the individual auditors to 1.33 for the groups ( $t = 2.31$ ,  $p = 0.3$ ). The results also indicate that there was no significant change in the assessed audit effort between the LP/HO (I) and LP/HO (G) participants ( $t = 1.21$ ;  $p = .33$ ). On the other hand there was a significant *increase* in the assessed audit effort between the HP/LO (G) and HP/LO (I) participants ( $t = 4.59$ ;  $p < .05$ ). These results strongly support H2b.

**Table 4**  
**Difference in Mean Scores (Individuals versus Groups)**

<u>Panel A:</u>						
Measure	Brainstorming Individuals			Brainstorming Groups		
	HP/HO	LP/LO	Row Diff.	HP/HO	LP/LO	Row Diff.
Fraud Risk Assessment	7.40	5.10	2.30	8.21	4.57	3.64
Audit Effort	3.88	1.26	2.62	4.36	.93	3.43
<u>Panel B:</u>						
Measure	Brainstorming Individuals			Brainstorming Groups		
	HP/LO	LP/HO	Row Diff.	HP/LO	LP/HO	Row Diff.
Fraud Risk Assessment	7.21	6.14	1.07	8.00	6.00	2.00
Audit Effort	3.64	2.81	0.83	4.31	2.98	1.33

<sup>5</sup> We used a paired sample t-test to analyze the significance of all the differences indicated in Table 4.



The results supporting H2a and H2b provide further evidence in support of how selective perceptions could affect the decision making in an audit context. The results also indicate how such selective perception could be accentuated in a group judgment and decision making context without a normative or specific correct or incorrect answer.

## DISCUSSION

The results related to H1a and H1b indicate that auditors report a higher fraud risk and audit effort in situations of high pressure/low opportunities than situations of low pressure/high opportunities. This implies that there exists among auditors selectively perceive pressures to be a more likely driver of fraud than opportunities while assessing fraud risk. This result is driven by two factors. First, because of the education and training, auditors perceive the opportunities to be more controllable and accurately assessable than pressures. Second, a significant number of frauds have been committed by management override of internal controls and hence the auditors could perceive that management under significant pressures can “create” opportunities even in scenarios where they are not present.

The study contributes to literature on groups by indicating how group brainstorming may accentuate the decisions taken by individuals in situations when there are no definite correct or wrong answers. The results of this study indicate that differences observed in the individual auditors’ fraud risk assessment and audit effort under different levels of pressures and opportunities, were significantly accentuated when they worked in groups. This is perhaps because in cases without a normatively correct solution (e.g., an audit setting), differing group members find it very difficult to argue against the views of the majority. Thus, even though the accounting standards (e.g., SAS No. 99) have prescribed group brainstorming to increase the effectiveness of the fraud risk assessment process, it could actually have no consequence or even make auditors less sensitive to certain fraud risk factors. The study also contributes to accounting literature by testing the impact of SAS No. 99 recommended group brainstorming on the audit process. To the best of our knowledge, this is the first study to have tested and documented the role of selective perceptions on individual and group-based decision making in an accounting setting.

The results of our study have important implications for practicing auditors and accounting standard setters. In an audit setting, a fraud risk assessment task is one of the most difficult and complex tasks, requiring

complex cognitive processing. Given the high cognitive processing needed during fraud risk assessment, selective perceptions about the importance of situational factors (pressures, opportunities) may help reduce the complex cognitive effort needed and in coming to a final decision quickly. However, perceptions are, by their very nature, selective and could adversely affect decisions. Therefore, the standard setters should try and develop some debiasing techniques to make the auditors aware about such potential perceptions and their effects on the auditors' assessments and effort. Consequently, before undertaking a fraud risk assessment the auditors themselves should also try and ensure that such selective perceptions do not affect their judgments.

The present study suffers from some limitations. First, there is an underlying assumption in our study that a higher assessed fraud risk and audit effort is an ideal outcome in all scenarios. Although this notion is consistent with the brainstorming literature, as well as SAS No. 99, it should also be recognized that a potential effect of this process is the risk of unnecessarily increasing the audit scope. Second, our results were obtained using a particular set of pressures and opportunities from prior research. Future research could determine and evaluate our findings using different tasks and different combinations of pressures or opportunities. Third, the results of the present study have been obtained in an specific accounting context and need to be validated in other work contexts in order to ensure their generalizability in an overall organizational context.

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