



BBR. Brazilian Business Review

ISSN: 1807-734X

Fucape Business School

Santos, Cleston; Cunha, Paulo
Influence of Trust, Time Pressure and Complexity Factors in Judgment and Decision-Making in Auditing
BBR. Brazilian Business Review, vol. 18, no. 6, 2021, November-December, pp. 605-623
Fucape Business School

DOI: <https://doi.org/10.15728/bbr.2021.18.6.1>

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ARTICLE

Influence of Trust, Time Pressure and Complexity Factors in Judgment and Decision-Making in Auditing

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ABSTRACT

This study aims to evaluate the interrelation of the influence of the factors trust (personal), time pressure (environmental) and complexity (task) in judgment and decision-making in the auditing field. As a research method, we undertook an experiment, with a 2x2x2 factorial composition. The final sample was composed of 126 independent auditors, distributed in eight random groups. The results indicated that a higher level of confidence increases the auditor's propensity to perform the accounting adjustment and that time pressure and complexity decrease the auditor's propensity to perform the proposed adjustment. These findings allow us to infer that the factors of trust, time pressure, and complexity, both individually and jointly influence judgment and decision-making. This study contributes to Behavioral Decision Theory, as in that the discussions are directed to assist auditing firms in their understanding of the joint and interactive effect of personal, environmental, and task factors in professional activities, and enable better planning and establishing criteria for audit working conditions.

KEYWORDS

Trust Personal Factor, Time Pressure Environmental Factor, Complexity Task Factor, Audit Judgment and Decision-Making

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Received: 04/02/2020.

Revised: 09/11/2020.

Accepted: 02/22/2021.

Published Online: 11/05/2021.

DOI: <http://dx.doi.org/10.15728/bbr.2021.18.6.1>



1. INTRODUCTION

Considering that judgment and decision making (JDM) involve the power of choice, the auditor has been considered a fundamental element for the preparing of accounting information, as they certify the quality and reliability of accounting reports, mainly in a system based on principles (Ussahawanitchakit, 2012). The predominance of the audit judgment is based around the auditor's decisions regarding the audit risk and the materiality in carrying out its procedures (Poonpool & Chanthinok, 2011).

It is routine in the audit activity for professionals to deal with tasks of increasingly difficulty, whether in the process of planning, development, or conclusion (Snead & Harrell, 1991; Trotman, 1998; Grenier et al., 2018). The challenges have been intensified, mainly, by factors that involve the nature of the work, such as task difficulties, as well as aspects of inadequate resources or labor, uncertainties or pressures of professional activity (Trotman, 1998; Mohd-Sanusi & Mohd-Iskandar, 2006). In this regard, Trotman (1998) argues that the challenges surrounding the audit activity can result in the absence of consensus and imprecision among auditors, negatively affecting the quality of judgment and decision making.

Bearing in mind that to improve the judgment and decision-making process, the research developed in this context has explored several aspects of the audit and accounting literature. This process resulted in questions about the opportunity to classify the aspects discussed in personal, environmental and task factors, in addition to generating reflections on possible interactions between factors (Bonner, 1999; Mala & Chand, 2015). According to Libby and Luft (1993), Mala and Chand (2015), Trotman, Bauer and Humphreys (2015) and Grenier et al. (2018), there are differences in judgment and decision making for different cognitive processes adopted as a result of personal and environmental factors and tasks inherent to audit activities.

When discussing only one factor, whether personal, environmental, or task, the impact of that factor has been identified on judgment and decision making, however this does not indicate that the intensity and sense of this influence are equal when these factors are observed in set. As there is evidence that personal, environmental, and task factors individually affect judgment and decision-making, when analyzed jointly and interactively, they can intensify, mitigate, or even change the direction of influence when analyzed in isolation.

Trust (personal factor), time pressure (environmental factor) and complexity (task factor) are factors that have shown signs of individual influence in the process involving judgment and auditor decision making. Trust, as a personal factor, is characterized as the belief that another person can perform actions that bring positive results for the former, and also that the latter will not act unexpectedly, bringing negative results to the other (Anderson & Narus, 1990). Bearing in mind a more consistent JDM, professionals seek to exchange advice with one or more trusted colleagues (Harvey & Fischer, 1997; Kennedy et al., 1997; Han et al., 2011).

The pressure of time means that the auditor has to carry out judgment and decision making quickly, which tends to impact the increase in JDM difficulty and error and, thus, negatively affects the quality of the work (Bamber & Bylinski, 1987; Gundry & Liyanarachchi, 2007; Svanström, 2016). In auditing, complexity also tends to increase the difficulty and uncertainty in the JDM, impairing the quality of the work (Bonner, 1994; Tan & Kao, 1999; Alissa et al., 2014). In this context, the objective is to evaluate the influence of the interrelation of the factors trust, time pressure, and complexity on judgment and decision making in auditing.

The originality of the study lies in attributing a new vision to analyzing the quality of judgment and decision making in auditing, as represented by the joint assessment of the influence of personal, environmental, and task factors in the judgment and decision making in auditing.

There is a lack of studies that explore the three factors together, considering it is not just one that influences the JDM. The direction, or strength, of a factor analyzed in isolation may be different from the observation of joint influence. In addition, as they are inherent factors in the auditor's professional activity, they need to be considered together. Judgment and decision making is essential for the audit, as these professionals constantly form opinions and create alternatives in order to make choices in order to give their opinion on the set of financial statements analyzed.

The main purpose of undertaking research in auditing, and decision making in auditing, is to understand individual and group judgments and decisions, since the entire process of auditing work is full of professional judgments, characterized by evidence common to the need for judgments in the face of International Auditing Standards (Trotman, Tan & Ang, 2011). The existing studies in this field have focused on the potential implications of policy improvements in areas, such as the development and modification of audit methods, standards and procedures, approaches to training and supervision, and the creation of forms of decision assistance (Boritz, 1985; Mala & Chand, 2015).

For the present research, the experiment was adopted as an operationalization method, which allows the identification and control of threats to the internal and external validities and, therefore, the elimination of the influence of strange variables. The experiment contributes to the direct manipulation and control of the variables under discussion, allowing the observation of the judgments and decision making of the participants in scenarios consistent with the activity performed by the auditor in their daily lives.

2. THEORETICAL FRAMEWORK

2.1. JUDGMENT AND DECISION MAKING

The JDM involves the formation of an idea before the elements that are part of the current scenario, as well as the choice between possible alternatives for the accomplishment of a pre-planned activity. To Cognitive Psychology, judgment and decision making are treated as different, but interrelated processes, with judgment referring to the analysis of the available choice options, while decision making requires the choice of one of the options analyzed (Plous, 1993; Tversky & Kahneman, 1981). Therefore, the study on JDM in auditing aims to analyze and observe factors that may impact the improvement and quality of audit work (Trotman, Tan & Ang, 2011).

Considering the relevance of JDM in accounting and auditing and aiming to contribute to improving the quality of final decisions, Bonner (1999) presented a structure in which he classifies studies into three categories: personal, environmental, and task factors. With this categorization, variables in the context of JDM can be explored and understood in greater depth.

Bonner (1999) argues that studies with an approach to judgment and decision making in this area have analyzed, in isolation, elements that have characteristics of personal, environmental, and task factors. Based on the discussion by Bonner (1999), authors such as Mala and Chand (2015) and Trotman et al. (2015) carried out literature review studies and, based on findings from previous studies, also initiated reflections on the interrelationship of personal, environmental, and task perspectives. According to Bonner (1999), Mala and Chand (2015) and Trotman et al. (2015), the analysis of the interrelationship of personal, environmental, and task perspectives in JDM is necessary.

2.2. THE FACTORS TRUST, TIME PRESSURE AND COMPLEXITY IN JUDGING AND DECISION MAKING

In the JDM process, personal, environmental, and task factors can be decisive to influencing the quality of the auditor's final work (Bonner, 1999; Mala & Chand, 2015). Based on the Behavioral Decision Theory, the Anchoring Heuristic can help in the analysis of the influence of personal, environmental, and task factors in JDM, as it has explanatory elements of JDM (Tversky & Kahneman, 1974; Kahneman, 2003). The heuristics correspond to the simplification of the mental search processes, which includes the selection and analysis of information for decision-making.

Heuristics have, as a parameter, the limitation of available information and the purpose of identifying the best result for the problem in question (Tversky & Kahneman, 1974). Through the Anchoring Heuristic, the JDM is performed by adjusting an aid or initial parameter, as an approximate value or information that easily appears in the minds of professionals (Tversky & Kahneman, 1974; Morris, 1993; Plous, 1993). This aid, or initial parameter, can be a decision aid, such as the advice given by a trusted coworker, for example.

To assess the influence of the interrelation of factors in JDM, trust was defined as a personal factor, as an environmental factor, time pressure and as a task factor, complexity. We believe the level of trust influences the auditor's JDM. The literature shows that trust contributes to the reduction of uncertainty (Mayer et al., 1995). It is also observed that there is a presence of trust among auditors who receive help from fellow auditors with whom there is a sharing of social ties, which can contribute to the reduction of process uncertainties (Kennedy et al., 1997; Kadous et al., 2013).

It is routine to carry out audit work in groups of professionals. When these groups contain auditing professionals who are colleagues with a strong social bond, trust can appear through expectations for an exchange of advice, which can be absorbed more easily, as well as analyzed in greater depth, serving as well as a parameter for judgment and final decision-making (Mayer et al., 1995; Harvey; Fischer, 1997; Kadous et al., 2013). According to Harvey and Fischer (1997) and Kennedy (1998), the presence of trust in advice received from coworkers makes it possible to consider other opinions for the JDM, which contributes to increasing the quality of the final work. This advice can be considered as a decision aid, and as an anchoring heuristic, which would simplify the JDM process. The implications of recommendations in decision can be useful in the development and implementation of decisive, intelligent and effective aids.

According to DeZoort et al. (2003), uncertainty weakens the auditor's materiality argument, which can influence the probability distribution around the true value of the proposal or the materiality adjustment in the audit. Therefore, as trust in the audit partner's board influences the reduction of uncertainty, and this influence decreases the chance of support for an adjustment, it is expected that there will be greater support for carrying out an audit adjustment when there is trust on the advice received. In this study, the accounting adjustment in the experimental task happened in the context of a discussion of write-off of receivables, in which there was a disagreement between two auditors. The research participant, faced with the analyzed scenario, which also involved materiality, was asked to decide whether to support the adjustment.

Despite trust indicates a tendency to reduce uncertainty, the quality of JDM tends to be impaired in situations of time pressure, in which the probability of increasing uncertainty and errors may be greater than in situations without pressure (Bamber & Bylinski, 1987; Pierce & Sweeney, 2004; Gundry & Liyanarachchi, 2007; Svanström, 2016).

Although auditors perform similar tasks at different times, it is common for time allocation to have a large discrepancy between these similar tasks. Considering that, Svanström (2016) argues that in audit activities for which the time for completion is short, the quality of the JDM is at risk.

In time pressured situations, the difficulty and uncertainty of the task tend to increase, which negatively influence a possible belief in the correct value of an adjustment in materiality (DeZoort et al., 2003). DeZoort et al. (2003) argue that, in such scenarios, the auditor will face more resistance to support an adjustment.

In that regard, complexity also tends to contribute to increased uncertainty. We consider that the complexity of the task influences the auditor's judgment and decision-making. According to Bonner (1994), the increase in the complexity levels of the task results in more information to be analyzed, even with greater imprecision and uncertainty. In this situation, probably the quality of JDM will be negatively affected.

When there is a lack of consensus among auditing professionals, uncertainty is intensified especially in scenarios of high difficulty that auditors may encounter when making judgments and decisions simultaneously for various auditing tasks, which have a lot of information and possible procedures for auditing to be adopted (Libby & Lipe, 1992; Mohd-Sanusi & Mohd-Iskandar, 2006; Alissa et al., 2014). Uncertainty and difficulty tend to vary between tasks, mainly because the audit work lives with scenarios that fluctuate a lot in terms of low and high complexity.

According to Chung and Monroe (2001), this oscillation of the scenario between low and high complexity is justified in the variation between the type and size of the account balance or group of accounts and in the amount of evidence and consistencies linked to the information obtained. According to Kahneman (1973), the degree of attention and mental processing required for the development of a specific task determines its level of complexity.

The development of studies on JDM in accounting and auditing in different contexts stimulated the discussion of a categorization of these variables, which identified findings and contributions to the literature, proposed by Bonner (1999). The author classified the elements explored in studies of judgment and decision making in accounting and auditing as belonging to personal, environmental or task factors. With the categorization and deepening of the discussions, reflections on possible connections between the factors began to emerge (Bonner, 1999; Mala & Chand, 2015).

The literature has pointed out evidence of differences in judgments and decision-making for the different cognitive processes adopted (Mala & Chand, 2015; Trotman, Bauer & Humphreys, 2015; Grenier et al., 2018). According to Mala and Chand (2015), Trotman, Bauer and Humphreys (2015) and Grenier et al. (2018), these differences in JDM have been observed as isolated results from the influence of personal, environmental, and task factors. Evidence of isolated factors presents evidence that a joint analysis would be necessary. For example, environmental variables can influence the amount of effort, motivation, and knowledge applied by the decision maker, as well as impact on the demands of the tasks (Libby & Luft, 1993; Mala & Chand, 2015).

According to the context presented, with the categorization of the elements of the discussions on JDM into personal, environmental, and task factors, the authors point out the need and importance of the interrelation of these three perspectives for new findings (Mala & Chand, 2015; Trotman, Bauer & Humphreys, 2015). Evidence of the individual influence of personal, environmental, and task factors in judging and decision-making in auditing and the possible relationship between them creates an opportunity to explore the joint effect of these variables on the JDM in auditing. It can also contribute to the improvement of the audit activity, since it is not just one factor that influences it (Mala & Chand, 2015).

Therefore, a joint effect of these factors is expected in the JDM. The environmental factor time pressure, when present, tends to negatively influence the quality of JDM. Time pressure can result in uncertainties and errors in the JDM process, which can have this effect intensified when the task has a high level of complexity (Bamber & Bylinski, 1987; Bonner, 1994; Mohd-Sanusi & Mohd-Iskandar, 2006; Svanström, 2016). As the development of teamwork is routine in auditing, the presence of the personal factor of trust among colleagues, as in giving and receiving advice, can contribute to the reduction of difficulties and uncertainties in the conduct of activities (Mayer et al., 1995; Han et al., 2011; Kadous et al., 2013).

Advice received from a trusted coworker can be treated as a decision aid and as an anchoring heuristic. Kowalczyk, Wolfe and Prawitt (1998) argue that the anchoring heuristic describes and simplifies the judgment that occurs when individuals cannot ignore certain knowledge when processing information in JDM. The advice received from trusted colleagues is intended to increase the accuracy and consistency of JDM, minimizing the effects of time pressure and task complexity, reveals evidence of the joint influence of the factors trust, time pressure and complexity on the JDM (Ashton, 1990; Kowalczyk, Wolfe & Prawitt, 1998). Thus, the hypothesis arises that the level of trust, the time pressure and the complexity of the task, together, influence JDM.

3. METHODOLOGICAL PROCEDURES

The present research uses the experiment as a method and the approach to the problem is quantitative.

3.1. SAMPLE

For planning, a minimum sample of 15 participants per condition/group was stipulated, with at least 120 participants, which were distributed in eight groups (Cozby, 2003). The research was applied after the Ethics Committee approved the project.

The target audience of the sample, composed of accessibility, were independent auditors from 14 audit firms, registered with the Brazilian Securities and Exchange Commission. The invitation was initially made by telephone, with the presentation letter and research details sent by e-mail. After acceptance, the legal representative of the audit firm signed the Research Development Request and Authorization Form. On the date scheduled for the application of the experiment *in loco*, before the audit task was carried out, each participant read and signed the Free and Informed Consent Form.

The audit firms that participated in the survey are located in the states of Paraná (02), Santa Catarina (08), Rio Grande do Sul (01) and Mato Grosso do Sul (03). Of the total of 132 participating professionals, 26 are from Paraná, 74 from Santa Catarina, eight are from Rio Grande do Sul and 24 auditors are from the state of Mato Grosso do Sul. Of the 132 participants, after tabulation of the data, six were excluded from the analysis for not having correctly filled out the research instrument for the experimental task. Therefore, the final sample was composed of 126 auditors.

3.2. CONSTRUCT AND EXPERIMENTAL DESIGN

Table 1 shows the construct of this research, according to the specific objectives, the dimensions of the research and the analysis procedures for each specific objective. Table 1 also presents variables and sub-variables for each dimension of the research, the metric that was used to measure the variables and the theoretical reference base of previous studies.

Table 1

Construct of the research

Dimensions	Variables	Subvariables	Metric	Authors
Personal Factor	Trust (TRU)	Capacity (CAP)	Statements 1 to 6 - model by Mayer et al. (1995)	Mayer et al. (1995); Kadous et al. (2013); Lleó de Nalda et al. (2016)
		Integrity (INT)	Statements 7 to 11 - model by Mayer et al. (1995)	
		Benevolence (BEN)	Statements 12 to 17 - model by Mayer et al. (1995)	
Enviromental Factor	Time Pressure (TP)	–	No Time Pressure established; With Time Pressure established.	Bamber e Bylinski, (1987); Svanström (2016)
Task Factor	Complexity (COM)	–	Low complexity (low amount of information and high clarity / accuracy of information);	Bonner (1994); Chung e Monroe (2001);
Judgment and Decision Making	Judgment and Decision Making (JDM)	–	High complexity (high amount of information and low clarity / precision of information).	DeZoort et al. (2003); DeZoort et al. (2006)

Source: research data

After defining the initial procedures, the operational configuration of the treatments that were applied to the experimental group was presented. The experiment setup included a 2x2x2 factorial, which required the composition of eight groups for the experimental treatment. In this composition, the independent variables were tested using the eight possible combinations, as follows:

- Group 1 - High Level of Trust (HLC), High Complexity (HC) and With Time Pressure (WTP);
- Group 2 - HLC, Low Complexity (LC) and WTP;
- Group 3 - HLC, LC and No Time Pressure (NTP);
- Group 4 - HLC, High Complexity (HC) and NTP;
- Group 5 - Low Trust Level (LCL), AC and CPT;
- Group 6 - LCL, LC and WTP;
- Group 7 - LCL, LC and NTP;
- Group 8 - LCL, HC and NTP.

In each audit firm, participants were randomly and equally divided into each of the eight analysis groups, according to a standardized experimental script. The participants were guided by the researcher in a standardized speech, with a previously established text, emphasizing, even, the non-permission of communication between the subjects object of the research.

Smith (2017) highlights the threats to the experiment's internal validity that need to be identified and minimized by adopted procedures. Table 2 shows the characteristics of each threat, as well as the control measures that have been taken.

Table 2
Threats to internal validity

Threats	Threat characteristics	Threat control measures
Maturation	Changes undergone during the experiment (physical, psychological, fatigue, boredom).	Task with quick decisions and the duration was a maximum of 30 minutes.
History	Impact on people during environmental changes resulting from the passage of time (long).	Experiment was applied to the subjects in a short period, at most 4 months (from the first to the last subject).
Subject Mortality	Loss of research participants before the end of the experiment.	Each subject participated only once in the experiment, which had a short time of operation.
Instrumentation	In identical procedures, measurements may differ due to the application of different procedures.	Application of the instrument by the same person (standardized text). Consolidated instruments: Mayer et al. (1995); DeZoort et al. (2003, 2006) and Kadous et al. (2013).
Selection	Problems in the selection and allocation of participants to treatment and control groups can generate groups with different characteristics. Participants need to be allocated to groups at random for comparability purposes.	The experimental treatment was applied to all individuals. Subjects were randomly distributed by group and in equal quantities.
Statistical Regression	Consequence of choosing individuals based on their extreme results. This threat is also present when there is no control group and random selection of participants.	Participants were randomly selected, following the experimental script. Professionals from all audit functions participated in the experiment, contemplating varied experiences, not just extremes.
Imitation Treatments	If there is communication between the participants during the operation of the experiment, the judgments and decision-making can have problems of independence.	Each subject analyzed the scenario and made the judgment and decision making individually, being submitted to only one experimental condition and without communication with the other participants.
Resentful Demoralization	In order to carry out the experiment, participants are submitted to different types of experimental treatments, which can generate different levels of motivation, with possible influence on the results.	The different experimental treatments (trust, time pressure, complexity) are factors inherent to the auditor's activities.

Source: research data

In addition to internal validation, the experiment needed external validity, which aims to show the degree to which the results can be generalized. As external validity, according to Smith (2017), there is Population Validity, Ecological Validity and Temporal Validity. Table 3 presents the characteristics of each threat, as well as the control measures.

Table 3
Threats to external validity

Threats	Threat characteristics	Threat control measures
Population Validity	Sample results may not be generalizable to populations, such as people, companies, countries and / or cultures.	The generalization of the results was extended to the context of the present study. The survey was conducted with independent auditors.
Ecological Validity	It refers to the generalization of the study results to other experimental configurations. Application of the experiment closest to reality.	The task presented to participants for JDM was constructed based on data from real companies, similarly to DeZoort et al. (2003, 2006) and Kadous et al. (2013), adapted to the reality of Brazil.
Temporal Validity	The results of the experiment may not be generalized over the period / time.	The generalization of the results is limited to the period of analysis, that is, from July to November. The experiment captured the behavior of individuals at the time they were subjected to experimental treatments, without reaching any temporal changes, such as the closing period of the audit report.

Source: research data

3.3. DATA COLLECTION INSTRUMENT

To respond to the proposed objective, the eight groups responded to the ‘accounting audit task’, involving materiality in the write-off of receivables, as adapted from Mayer et al. (1995), DeZoort et al. (2003), DeZoort et al. (2006) and Kadous et al. (2013). From the study by DeZoort et al. (2006), the scenario was adapted for the JDM in the write-off of receivables. By DeZoort et al. (2003), the context of the accuracy of the information was adapted to control complexity. By Kadous et al. (2013), the context of the exchange of advice and the determination of trust was adapted. By Mayer et al. (1995), the instrument was used to measure trust based on the factors capacity, integrity, and benevolence. As the complete instrument of the experiment was adapted and validated in other international studies, it underwent reverse translation, adjustments, and pre-tests before the empirical application.

The task involved discussing receivables write-off, in which there was a disagreement between two auditors. The research participant, faced with the analyzed scenario, decided whether to support the adjustment, on a scale that ranged from -5 to +5, then present his or her argument. After completing the task, the participant answered the ‘post-experiment questionnaire’, with their perception of the factors analyzed and the identification of demographic data. The instrument for data collection contained two parts: the first, composed of nine blocks, had the scenario of the experiment, while the second part, the post-experiment questionnaire.

Before the instrument was fully validated, the procedure was carried out to establish the time pressure condition. Thereby, for the experimental task, a pilot study was carried out to determine the distribution (mean and standard deviation) of time needed to complete the tasks. For this stage, 23 students from the Accounting Course of an educational institution, who were taking the accounting audit discipline, were invited to participate in the pilot test. After verifying the

normal distribution of times, in order to establish the duration of low and high complexity tasks, under the condition of time pressure, the first decile of times was defined. The choice of the first decile was defined as the condition of extreme time pressure, a situation that is routine in audit activities. Thus, through the first decile, it was established that the task of low complexity in the condition of time pressure would last 11 minutes and in the task of high complexity, 13 minutes.

Before the application of the experiment with the auditors, a pre-test of the complete instrument was carried out with 186 Accounting students who were taking or have taken the accounting audit discipline. The results of the pre-test analyzes presented in this topic allowed to reveal consistency in the instrument proposed for use with audit professionals.

After performing the pre-test, the experiment was applied to the participating auditors in a self-administered manner, without any intervention by the researcher. After the invitation to participate in the experiment and the acceptance, a date was scheduled with each firm to operationalize the experiment on the premises of the audit company itself. The experiment was applied in the months of July, August, September, October and November 2017.

3.4. DATA ANALYSIS PROCEDURES

For data analysis, descriptive statistics, Multiple Linear Regression, and Multiple Correspondence Analysis were used. In order to test the research hypothesis, Multiple Linear Regression was defined, with the Ordinary Least Squares model. To test the hypothesis, the following equation was defined:

$$\text{JDM} = \beta_0 + \beta_1\text{TRU} + \beta_2\text{TP} + \beta_3\text{COMP} + \beta_4\text{TRU}*\text{TP} + \beta_5\text{TRU}*\text{COMP} + \beta_6\text{TP}*\text{COMP} + \beta_7\text{TRU}*\text{TP}*\text{COMP} + \varepsilon_i$$

Equation (1)

On what:

JDM = Judgment and Decision-Making, measured by the 11-point scale that ranged from - 5 (Definitely not making the adjustment) to +5 (Definitely making the adjustment);

TRU = Trust, having the experimental treatment: with a high level of trust and a low level of trust;

TP = Time pressure, having the experimental treatment: without established time pressure and with established time pressure;

COMP = Task Complexity, with experimental treatment: low complexity and high complexity.

TRU * TP = Variable of influence of time pressure and trust in judgment and decision making;

TRU * COMP = Variable influencing the complexity of the task and trust in judgment and decision making;

TP * COMP = Variable influencing the complexity of the task and time pressure on judgment and decision making;

TRU * TP * COMP = Variable of joint influence of task complexity, time pressure and trust in judgment and decision making.

4. DATA RESULT AND ANALYSIS

4.1. DESCRIPTIVE ANALYSIS

In the characterization of the respondents, male auditors were the predominant participants in the experiment, with 65.10% (82). Women had a percentage of participation of 34.90% (44). These results converge with the studies by Chung and Monroe (2001) and by DeZoort et al. (2003), in which male auditors also have a predominant participation in the profession.

Considering age, participants had an average of 30 years, with a minimum age of 19 years and a maximum of 68 years. Regarding the position that the auditors occupy, there is a predominance of senior roles, representing 53.20% (67) of participants, followed by a manager or supervisor with 19.80% (25), 15.10% (19) of assistants, 7.9% (10) of partners and 4% (5) of trainees.

In the analysis of experience in the current position, the result showed that the average is 2.79 years, with a minimum experience of 0.10 years and a maximum of 26 years. When verifying the time of experience in the audit area, the average is 7.61 years, with 0.10 years being the minimum experience and the maximum 40 years. This result shows that the experience of the participants is superior to the study by DeZoort et al. (2006), which was 6.85 years. The experience of the study participants by Kadous et al. (2013) ranged from 2.5 to 8 years.

The predominance of the highest academic degree is a graduate degree, with 51.60% (65). Of the total, 47.60% (60) have a bachelor's degree and 0.80% (1) a master's degree. No participant with a doctorate was identified. Regarding the state of performance, 53.97% (68) of these professionals work in the State of Santa Catarina, 20.63% (26) work in Paraná, 19.05% work in Mato Grosso do Sul, 6.35% (8) in Rio Grande do Sul. Table 4 presents the descriptive statistics of the theoretical constructs analyzed in the experiment.

Table 4
Descriptive Statistics of Theoretical Construct

Factors/ Variables	Variables / Condition			Min.	Max.	Mean	Median
JDM Factors	JDM	Trust (TRU)	ANC	-3	5	3,641	4,000
			BNC	-5	5	-1,065	-3,000
		Time Pressure (PT)	SPT	-5	5	2,230	4,000
			CPT	-5	5	0,477	2,000
		Complexity (COMP)	BC	-5	5	2,127	4,000
			AC	-5	5	0,524	2,000
	JDM			-5	5	1,325	3,000

Subtitle: HLT = High Level of Trust; LLT = Low Level of Trust; NTP = No time pressure; WTP = With Time Pressure; LC = Low Complexity; HC = High Complexity; JDM Judgment and Decision-Making.

Source: Research Data.

On a scale of 11 points, which ranged from - 5 (Definitely not making the adjustment) to +5 (Definitely making the adjustment), the judgment and decision making of the participating auditors was on average 1.325, with support for the adjustment, but close to 0, which is the point of uncertainty. In this analysis, the median revealed a result of three and the standard deviation of 3.857.

In the analysis of the JDM by factor, it is observed, in the trust variable, that the average in the condition of a high level of trust was 3.641, indicating support for the proposed adjustment. This result presents an average close to the positive end, indicating conviction in supporting the adjustment. It is worth mentioning that this condition was the one with the lowest standard deviation, that is, it is the variable with the smallest measure of dispersion around the population average. In the condition of low levels of trust, the average was -1.065, indicating no support for adjustment. In addition to showing the lack of support for the adjustment, the average was close to the point of uncertainty, which was zero.

The results reveal that the board, supporting an adjustment when received from someone with a high level of trust, tends to influence, in a positive way, the adjustment. When received from someone with a low level of trust, the influence tends to be reversed. It was also shown that under conditions of time pressure and with a highly complex task, the participant tends to have difficulties in deep and detailed analysis of the information and, thus, ends up showing uncertainty in supporting proposed adjustments or does not support proposed adjustments.

4.2. ANALYSIS OF THE EXPERIMENT RESULT

In this section, we seek to verify the individual and joint effect of the factors trust, time pressure, and complexity in JDM. For that, we used Multiple Linear Regression, Ordinary Least Squares (OLS) model, as shown in Table 5. Although the dependent variable has characteristics of a truncated variable, the results in the Tobit model, for the present study, were similar, which did choose the OLS model for the multiple linear regression models. Before the regression analysis, the normality and homoscedasticity of the residues were verified.

To verify normality, the Kolmogorov-Smirnov test was used, whose results showed a significance (sig.) of 0.000, which, in principle, does not show a normal distribution of variables at a level of 5%. When considering the arguments of Hair Jr. et al. (2009, p.50), that “values that fall between -1 and +1 are still considered symmetrical”, the asymmetry was verified. After checking the asymmetry (-0.017), it was considered that the residuals of the data under analysis have normal distribution.

Afterwards, Levene's homoscedasticity test was verified. The result showed a significance of 0.079. In view of the non-significant result, the hypothesis of the variance of errors as being uniform is confirmed, showing that the residues are homocedastic.

According to the arguments of Maroco (2014), that the adjusted R^2 reveals the level of generalization of the results, values close to R^2 allow a greater capacity of the regression model to explain the findings. Table 5 shows the coefficient of determination (R^2) of the regression model. The result shows an R^2 of 0.563, which allows us to infer that the independent variables analyzed explain 56.3% of the JDM task in accounting auditing. Therefore, as the adjusted R^2 is high and close to R^2 , the findings reveal that R^2 has a satisfactory power to explain the regression model.

In the analysis of Durbin-Watson, a result in range 2 is observed, indicating the independence of the residues and the non-relationship between them. According to Maroco (2014), results from Durbin-Watson close to 2 point out that there is no first-order autocorrelation problem between wastes.

In order to verify whether there is linearity in the analyzed data and that at least one of the independent variables is capable of explaining the variation of the dependent variable, the significance of ANOVA must be less than or equal to 0.05 (Maroco, 2014). According to Table 5, as the significance of ANOVA is less than 0.05, it is considered that there is evidence that the variables trust (TRU), time pressure (TP), complexity (COMP), TRU*TP, TRU*COMP,

TP*COMP and TRU*TP*COMP significantly influence judgment and decision making in auditing. In the analysis of the VIF, the result confirms that there are no multicollinearity problems, since the values are not higher than ten (Kennedy, 1998).

In the linear regression model, according to Table 5, the independent variables trust (TRU), time pressure (TP) and complexity (COMP), TRU*TP, TRU*COMP, TP*COMP and TRU*TP*COMP can be considered statistically significant at the level of 5% (p-value <0.05).

Table 5

Result of the multiple regression model of joint influence of the factors trust, time pressure and complexity in the judgment and decision making in audit

Independent variables		Model - multiple linear regression		
		Coefficient / Sig.		VIF
Constant		Coefficient	1,319	–
		Sig.	0,000	
TRU		Coefficient	2,322	1,003
		Sig.	0,000	
TP		Coefficient	-0,787	1,002
		Sig.	0,001	
COMP		Coefficient	-0,823	1,003
		Sig.	0,001	
TRU*TP		Coefficient	0,678	1,002
		Sig.	0,005	
TRU*COMP		Coefficient	0,745	1,003
		Sig.	0,002	
TP*COMP		Coefficient	0,572	1,003
		Sig.	0,022	
TRU*TP*COMP		Coefficient	-0,495	1,003
		Sig.	0,037	
R		0,750		
R ²		0,563		
R ² Adjusted		0,537		
Durbin-Watson		2,096		
Anova	F	21,701		
	Sig.	0,000		

a. Predictors: (Constant), TRU*TP*COMP, TRU*TP, TP*COMP, TP, TRU*COMP, TRU, COMP

b. Dependent Variable: JDM.

Subtitle: TRU – Trust; TP – Time Pressure; COMP – Complexity; JDM - Judgment and Decision-Making.

Source: Research Data.

The result shows that the personal trust factor (TRU) positively influences JDM, indicating that the higher the level of trust, the greater the tendency for the auditor to support the proposed adjustment. As for the environmental factor time pressure (TP), the result reveals that it has a negative influence on the JDM, showing that, under conditions of time pressure, the tendency is for the auditor not to support the proposed adjustment. The result of the complexity task factor (COMP) also reveals a negative influence on the JDM, indicating that the development of tasks in highly complex scenarios will prevent the auditor from supporting the proposed adjustment.

In the analysis of the regression model, it is observed that time pressure and trust, together, positively influence judgment and decision-making (TRU*TP). Although these factors individually present opposite coefficients, trust has a high positive coefficient, which contributes to the positive influence. A similar result is observed in the influence of complexity and trust in the JDM (TRU*COMP), in which the trust of having a high positive coefficient makes the influence positive, indicating support for the proposed adjustment. Another result is the negative influence of complexity and time pressure on JDM (TP*COMP). In this case, although the coefficient is positive, the influence remains negative, as the individual signs of the time pressure and complexity factors are negative.

According to the results in Table 5, it can be considered that there is a joint influence of the personal, environmental, and task factors in the judgment and decision making in audit (TRU*TP*COMP). This results corroborates the arguments of Libby and Luft (1993), Bonner (1999), Mala and Chand (2015) and Trotman, Bauer and Humphreys (2015) and it is not possible to reject the research hypothesis that the level of trust, time pressure, and complexity of the task, together, influence JDM. In this analysis, it is observed that the joint influence is negative, indicating no support for the proposed adjustment. However, when considering that time pressure and complexity have a negative influence, trust mitigates this effect.

Among the three factors, the personal trust factor was the one with the highest coefficient, which shows the greatest explanatory power of the JDM. Trust, which in this model of analysis comprises capacity, integrity, and benevolence, needs to be present in the work environments of audit teams. Trust in coworkers makes it possible for advice received to be absorbed more easily, analyzed in greater depth and contribute to improving judgment and decision making (Mayer et al., 1995; Harvey & Fischer, 1997; Kennedy et al., 1997; Kadous et al., 2013).

The experiment showed that time pressure and task complexity influence JDM in the same direction, in a negative way. The existence of time pressure and high complexity of the task generate more uncertainties when performing the JDM, which influences not to support the proposed adjustment. In the condition of time pressure, the participant is unable to analyze the information in depth and, thus, will have to choose points to focus more on, which tends to increase the uncertainties. In a highly complex situation, in which there is more information, including inaccurate and unclear information, the uncertainty about the JDM is intensified, which makes audit work even more difficult.

Based on the findings of the joint analysis of the factors, as highly complex tasks require the analysis of inaccurate contexts, with lack of clarity and a high amount of information, making judgments and decision making difficult, the presence of time pressure will increase uncertainty. This scenario requires professionals to use mental shortcuts, such as the Anchoring Heuristic, to perceive the situation and evaluate alternatives. Thus, trust in coworkers enables the exchange of professional advice and, treated as an anchor for the appreciation of the information received, will contribute to the saving of time and effort employed in the JDM, minimizing the impact of uncertainty and difficulty. The Anchoring Heuristic establishes that, due to people's limited

rationality, there is a tendency for them to find a value or information as a reference, or anchor, for later adjustment and judgment (Tversky & Kahneman, 1974).

These findings are consistent with the results found in the pre-test with accountancy academics who have already taken, or were taking the accounting audit discipline. The pre-test with the academics validated the instrument, confirming the robustness of the proposed experimental treatments. Based on the main results obtained from the auditors and their comparison with the results generated in the pre-test with the academics, who also had a sufficient sample to test the entire instrument and the proposed tests, consistency in the experimental treatments and results obtained was observed. This indicates the importance of also considering academics in research, as is already common in international studies.

5. CONCLUSION AND RECOMMENDATIONS

With the objective of evaluating the influence of the interrelation of the factors trust (personal factor), time pressure (environmental factor) and complexity (task factor) in JDM in auditing, the present research carried out an experiment with 126 auditors. To measure the personal factor, trust was defined, for the environmental factor, time pressure, and for the task factor, complexity.

The study made it possible to infer that the level of trust, time pressure, and complexity of the task, together, negatively influenced JDM. The experiment showed that the personal trust factor was the factor that had the strongest influence on the JDM, indicating that the higher the level of trust, the greater the propensity of the auditor to support the proposed adjustment. In the trust measurement model, in addition to benevolence, which includes the social bond, it was also considered capacity and integrity, which demonstrates more credibility in the advice exchanged when there is a high level of trust between professionals. Both the time pressure environmental factor and the complexity task factor, had a negative influence on the dependent variable, showing that, in scenarios involving time pressure and high complexity, the auditor's JDM will be less likely to support the proposed accounting adjustment. In these two scenarios, the auditor finds it more difficult to make a JDM, as time is limited to analyze a larger volume of information, mostly inaccurate.

In the joint analysis of the factors, in the existence of receiving advice between professionals who have trust in each other, there is a greater tendency for more consistent judgments and decision-making. With the receipt of advice, the use of the Anchoring Heuristic is perceived, as the individual lives with professional scenarios that, every day, present a different situation, with levels of complexity that vary according to the nature of the facts and pressures of time to complete the work, which can generate uncertainties and difficulties in completing the stipulated tasks. Thus, in the face of JDM under uncertainty and difficulties, professionals tend to adjust their final decision based on initial information or value, which can be treated as an anchor. The tendency for the advice received to be treated as an anchor will occur mainly when it comes from someone with high trust.

The results of this experiment advance the research by revealing that the influence of the personal, environmental, and task factors, in judgment and decision making in auditing, occur in an interrelated and joint way, which makes it essential to understand these factors as a whole, with a view to promoting improvements in the JDM process. This research adopted the classification of personal, environmental and task factors proposed by Bonner (1999), as well as corroborating the evidence and arguments presented by Bonner (1999), Mala and Chand (2015) and Trotman, Bauer and Humphreys (2015), confirming the connections between the factors. As the findings of previous studies have shown in isolation evidence of the influence of personal, environmental

and task aspects on the JDM in auditing, in this research it was possible to show the joint and interactive effect of these factors on the JDM.

The research contributions suggest that there is a need for the effects generated by personal, environmental and task factors to be considered and observed together. This view tends to contribute to improving the quality of the audit, through joint observation of the auditor's personal characteristics, the environment and the task to be performed, which can assist audit firms in better understanding the impacts of these factors on activities professionals and, thus, better plan and establish criteria in view of the diverse conditions of audit work.

It also contributes from the perspective of understanding trust as a personal factor, taking into account, in addition to the characteristic of benevolence, those of capacity and integrity, which enables a better reception and absorption of advice and information exchanged between colleagues of high level of trust. It contributes to the understanding that time pressure as an environmental factor and complexity as a task factor increase the uncertainties and difficulties in the JDM processes. It contributes in the perspective of understanding that trust in exchanged advice, through the Anchoring Heuristics, can reduce the effect caused by the pressure of time and complexity, serving as a parameter for the realization of the JDM.

The adoption of the experiment as an operationalization method allowed the identification and control of threats to internal and external validities, eliminating the influence of strange variables. The experiment enabled the direct manipulation and control of the variables under discussion and the observation of responses. Based on this method, the participant's judgment and decision-making was observed by the researcher, with no possibility for the participants to present perceptions about their own performances, in which they could reveal overtrust and overestimate their performances. The consistency of the experiment was reinforced with the post-experiment questionnaire.

The present research instrument allowed us to observe the behavior of individuals in the period in which they were submitted to the experiment, without reaching eventual temporal changes, such as those that could be influenced by the closing period of the audit report, in which the professionals have a high volume of information and activities, for example. In view of the evidence, we suggested that atypical periods are also considered in new research. New studies should also include control variables in experimental treatments, such as sex, experience and the size of the audit firm, which will make it possible to have significant groups for comparability purposes.

REFERENCES

- Alissa, W., Capkun, V., Jeanjean, T., & Suca, N. (2014). An empirical investigation of the impact of audit and auditor characteristics on auditor performance. *Accounting, Organizations and Society*, 39(7), 495-510.
- Anderson, J. C., & Narus, J. A. (1990). A model of distributor firm and manufacturer firm working partnerships. *Journal of Marketing*, 54(1), 42-58.
- Ashton, R. H. (1990). Pressure and performance in accounting decision settings: Paradoxical effects of incentives, feedback, and justification. *Journal of Accounting Research*, 148-180.
- Bamber, E. M., & Bylinski, J. H. (1987). The effects of the planning memorandum, time pressure and individual auditor characteristics on audit managers' review time judgments. *Contemporary Accounting Research*, 4(1), 127-143.
- Bonner, S. E. (1994). A model of the effects of audit task complexity. *Accounting, Organizations and Society*, 19(3), 213-234.

- Bonner, S. E. (1999). Judgment and decision-making research in accounting. *Accounting Horizons*, 13(4), 385-398.
- Boritz, J. E. (1985). The effect of information presentation structures on audit planning and review judgments. *Contemporary Accounting Research*, 1(2), 193-218.
- Chung, J., & Monroe, G. S. (2001). A research note on the effects of gender and task complexity on an audit judgment. *Behavioral Research in Accounting*, 13(1), 111-125.
- Cozby, P. C. (2003). *Método de pesquisa em ciências do comportamento*. São Paulo: Atlas.
- DeZoort, F. T., Hermanson, D. R., & Houston, R. W. (2003). Audit committee support for auditors: The effects of materiality justification and accounting precision. *Journal of Accounting and Public Policy*, 22(2), 175-199.
- DeZoort, T., Harrison, P., & Taylor, M. (2006). Accountability and auditors' materiality judgments: The effects of differential pressure strength on conservatism, variability, and effort. *Accounting, Organizations and Society*, 31(4-5), 373-390.
- Grenier, J. H., Reffett, A., Simon, C. A., & Warne, R. C. (2018). Researching juror judgment and decision making in cases of alleged auditor negligence: A toolkit for new scholars. *Behavioral Research in Accounting*, 30(1), 99-110.
- Griffith, E. E., Kadous, K., & Young, D. (2016). How insights from the "new" JDM research can improve auditor judgment: Fundamental research questions and methodological advice. *Auditing: A Journal of Practice & Theory*, 35(2), 1-22.
- Gundry, L. C., & Liyanarachchi, G. A. (2007). Time budget pressure, auditors' personality type, and the incidence of reduced audit quality practices. *Pacific Accounting Review*, 19(2), 125-152.
- Hair Jr, J. F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L. (2009). *Análise multivariada de dados*. 6. ed. Porto Alegre: Bookman.
- Han, J., Jamal, K., & Tan, H. T. (2011). Auditors' overtrust in predicting the technical knowledge of superiors and subordinates. *Auditing: A Journal of Practice & Theory*, 30(1), 101-119.
- Harvey, N., & Fischer, I. (1997). Taking advice: Accepting help, improving judgment, and sharing responsibility. *Organizational Behavior and Human Decision Processes*, 70(2), 117-133.
- Kadous, K., Leiby, J., & Peecher, M. E. (2013). How do auditors weight informal contrary advice? The joint influence of advisor social bond and advice justifiability. *The Accounting Review*, 88(6), 2061-2087.
- Kahneman, D. (1973). *Attention and effort*. Englewood Cliffs, NJ: Prentice-Hall.
- Kahneman, D., & TVERSKY, A. (1979). Prospect theory: an analysis of decision under risk. *Econometrica*, v. 47, March.
- Kahneman, D. (2003). A perspective on judgment and choice: mapping bounded rationality. *American Psychologist*, 58(9), 697-720.
- Kennedy, J., Kleinmuntz, D. N., & Peecher, M. E. (1997). Determinants of the justifiability of performance in ill-structured audit tasks. *Journal of Accounting Research*, 35, 105-123.
- Kennedy, P. (1998). *A guide to econometrics*, Blackwell, 4. ed. Oxford: Oxford Ed.
- Kowalczyk, T. K., Wolfe, C. J., & Prawitt, D. F. (1998). Anchoring effects associated with recommendations from expert decision aids: An experimental analysis. *Behavioral Research in Accounting*, 10(1), 147-169.

- Libby, R., & Lipe, M. G. (1992). Incentives, effort, and the cognitive processes involved in accounting-related judgments. *Journal of Accounting Research*, 30(2), 249-273.
- Libby, R., & Luft, J. (1993). Determinants of judgment performance in accounting settings: Ability, knowledge, motivation, and environment. *Accounting, Organizations and Society*, 18(5), 425-450.
- Lleo de Nalda, A., Guillen, M., & Gil Pechuan, I. (2016). The influence of ability, benevolence, and integrity in trust between managers and subordinates: the role of ethical reasoning. *Business Ethics: A European Review*, 25(4), 556-576.
- Mala, R., & Chand, P. (2015). Judgment and decision-making research in auditing and accounting: Future research implications of person, task, and environmental perspective. *Accounting Perspectives*, 14(1), 1-50.
- Maroco, J. (2014). *Análise estatística com utilização do SPSS*. 6. ed. Lisboa: ReportNumber.
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20(3), 709-734.
- Mohd-Sanusi, Z., & Mohd-Iskandar, T. (2006). Audit judgment performance: assessing the effect of performance incentives, effort and task complexity. *Managerial Auditing Journal*, 22(1), 34-52.
- Morris, D. E. (1993). Analysis of Auditors' Perceptions and Over-reliance on Negative Information. *Managerial Auditing Journal*, 8(6), 14-24.
- Pierce, B., & Sweeney, B. (2004). Cost-quality conflict in audit firms: an empirical investigation. *European Accounting Review*, 13(3), 415-441.
- Plous, S. (1993). *The psychology of judgment and decision-making*. New York: Mcgraw-Hill Book Company.
- Poonpool, N., & Chanthinok, K. (2011). Computerized-audit competency and audit efficiency of certified public accountants (CPAs) in Thailand: Mediating influences of audit judgment. *International Journal of Business Research*, 11(2), 156-169.
- Smith, M. (2017). *Research methods in accounting*. Fourth Edition. London: Sage.
- Snead, K., & Harrell, A. (1991). The impact of psychological factors on the job satisfaction of senior auditors. *Behavioral Research in Accounting*, 3(1), 85-96.
- Svanström, T. (2016). Time pressure, training activities and dysfunctional auditor behavior: evidence from small audit firms. *International Journal of Auditing*, 20(1), 42-51.
- Tan, H. T., & Kao, A. (1999). Accountability effects on auditors' performance: The influence of knowledge, problem-solving ability, and task complexity. *Journal of Accounting Research*, 37(1), 209-223.
- Trotman, K. T., Bauer, T. D., & Humphreys, K. A. (2015). Group judgment and decision making in auditing: Past and future research. *Accounting, Organizations and Society*, 47, 56-72.
- Trotman, K. T. (1998). Audit judgment research-Issues addressed, research methods and future directions. *Accounting & Finance*, 38(2), 115-156.
- Trotman, K. T., Tan, H. C., & Ang, N. (2011). Fifty-year overview of judgment and decision-making research in accounting. *Accounting & Finance*, 51(1), 278-360.
- Trotman, K. T., Bauer, T. D., & Humphreys, K. A. (2015). Group judgment and decision making in auditing: Past and future research. *Accounting, Organizations and Society*, 47, 56-72.

- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453-458.
- Ussahawanitchakit, P. (2012). Effects of audit morality on audit performance of certified public accountants (CPAs) in Thailand. *Journal of Academy of Business and Economics*, 12(4), 84-94.

CONFLICT INTEREST

The authors declare that there are no conflicts of interest.

CONTRIBUTION OF AUTHORS

Author 1: Theoretical review, methodological planning, data collection, data analysis and review; Author 2: Theoretical review, methodological planning, data analysis and review.