Role of Affective Neuroscience in Audit Judgement and Decisions Making: A Systematic Literature Review for Auditing Research

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ABSTRACT

This research aims to determine the connection of audit judgment and decision making with affective neuroscience. Systematic Literature Review explores the research of audit judgment and decision making being dominated by the role of cognitive issues in judgment and decision making, but only a few reviews about the role of affect. Thus, it is necessary to balance both affective and cognitive variables. This research reviews seven auditing articles that elaborate on the affective role in audit judgment and decision making, six articles related to Affective Neuroscience, mindful judgment and decisions from psychological journals and three additional articles that are important. Affective Neuroscience (of which the main premise is to produce affective labelling) helps the process of coding information that will provide benefits when the auditor undergoes training, in practice, the auditor's work atmosphere can be more positive, and if the auditor faces negative conditions, the effect can still be mitigated so that the resulting judgment can be accepted by the environment. This analysis provides useful insights that can be explored by future research to gain a broad understanding of the relationship between affective neuroscience with audit judgment and decision making so it can support the relationship between social theories and Affective Neuroscience. Affective Neuroscience's premise can help in understanding given judgement and decision-making by the auditor.

Keywords: Audit judgment and decision making, affective neuroscience, systematic literature review

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INTRODUCTION

The importance of judgment in generating professional quality triggered research on judgment and decision making in the early 1990s (Bonner, 1999), which was followed by subsequent research (Mactavish et al., 2018; Mala & Chand, 2015). The existing research on audit judgment emphasises the factors that determine the assessment when conducting an audit of a financial report. This research shows that emotional intelligence affects judgment. (Yang, Brink and Wier, 2017; Phan *et al.*, 2021), intrinsic motivation (Kadous and Zhou, 2019), mood (Bhattacharjee and Moreno, 2013), individual feelings towards clients (Robertson, 2010; Schafer and Schafer, 2018), composition of audit evidence (Peytcheva and Gillett, 2011; Lambert and Peytcheva, 2020; McNellis, Sweeney and Dalton, 2021), types of accounting standards (Tsunogaya, Sugahara and Chand, 2016), social interactions with clients (Eutsler, Norris and Trompeter, 2017), client preferred accounting methods (Kent and Weber, 1998; Cyr, Héroux and Fontaine, 2020) and key audit matters reporting requirements. Key audit matters themselves can build the value of communication between auditors and clients (Ratzinger-Sakel and Theis, 2019) and sensemaking (Miledi, 2021).

The development of audit judgment and decisions making research from 1990 onwards has integrated auditing science and psychology in examining how auditors give judgment and produce decisions in their audit assignments. Along with the integration of psychology and neuroscience, the equivalent can also be related to how judgment and decision making are given in terms of neuroscience. (Waymire, 2014; Tank and Farrell, 2021). Until the year 2000, the trend of audit judgment and decision-making was analysed using various theories. However, this is still on the level of exploring the behavior of auditors in giving judgments and decisions from a cognitive perspective.

Previous research that used both qualitative and quantitative methodologies was dominated by the use of cognitive psychology theory (Gibbins, 1984; Johnson, Jamal and Glen Berryman, 1989; Choo, 1996; Mala and Chand, 2015; Maradona, 2020; Hamdam *et al.*, 2022) which highlights the mental process of auditor in gaining experiences and knowledge to be able to produce judgment. Research on auditor judgment is also carried out by utilising various theories, such as social (Miledi, 2021) and behavioral theory (Kunda, 1999; Peytcheva and Gillett, 2011; Cyr, Héroux and Fontaine, 2020). The importance of audit judgment and decision making, aspects of assessment and decision making, is not only seen from the cognitive side of the auditor's and partner's behavior, but it is also seen in relation to the affective aspects (emotions, moods, evaluation) (Bhattacharjee and Moreno, 2002, 2013; Garcia and Herrbach, 2010; Finucane, Peters and Slovic, 2012; Schafer and Schafer, 2018). These articles examine the role of affect in auditor judgment and decision but do not explain in detail how these affects could affect the auditor's judgment and decision-making. In reality, affect can be evaluated through wrong attributions, for example, mental processes in judgments aimed at reaching certain causal conclusions (Schafer and Schafer, 2018).

Research on audit judgment and decision making is still considered useful because there are many scientific gaps that still need to be studied. Judgment and decision making research so far have interpreted more behavior in terms of goals and plans rather than questioning how important it is to make judgment and decision making (Weber & Johnson, 2009). According to Bonner (1999), there are four things in which audit judgment and decision making research is still relevant to do. First, in exploring various judgment and decision-making questions related to relevant and reliable assurance services in relation to financial and non-financial data. Second, in questioning things matters relating to the impact of technology used in the provisions of assurance services and judgment and decision making in general. Third, in examining accountability and decision aids. Fourth, in evaluating the performance of auditors,

both individual and audit firms, the result of this evaluation may lead to the provisions of compensation or fines.

Previous research used various *judgment* terms such as *judgment and decision making* (Bonner, 1999; Mala and Chand, 2015), professional judgment (Gibbins, 1984; Brown, Collins and Thornton, 1993; Schmutte and Duncan, 2009), *audit judgment* (Johnson, Jamal and Glen Berryman, 1989; Miledi, 2021), independent judgment (Peytcheva and Gillett, 2011). This research will used *auditor judgment and decision* making as a single terminology in discussing issues related to considerations and decisions in the realm of auditing.

The use of the term "judgement" in this study is aimed at subjective judgment made in the early stages of taking action (Solomon and Trotman, 2003). Auditors need to develop decision making skills which are of the utmost importance (van Kuijck and Paresi, 2020). Auditor decisions are the basis of the audit function about whether to ask the client to correct detected misstatements (Nelson & Tan, 2005).

The research on audit judgment and decision making that has been done has focused more on the auditor's behavior than seen from the cognitive side, while according to Panksepp (2011), research that only observes behavior, cannot reach definite conclusions, because it does not have direct access to the affective infrastructure that underlie certain brain mechanisms.

This research is a systematic literature review that aims to answer questions about the relationship between audit judgment and decision making with affective neuroscience. This research also tries to reveal how affect can be harmonised with neuroscience, which ultimately affects the judgment and decision making of auditors. This research provides a better understanding of mindfulness in audit judgment and decision making in the world of education as well as in practice, for auditors who will start their careers in public accounting firms can apply this mindfulness in audit judgment and decisions. This research provides a comprehensive overview of the theoretical framework to bridge the growing gap between academic research and practice that may require a cross-disciplinary approach, particularly aspects of the judgment process and audit decision making.

The premise of Affective neuroscience aims to provide relevant explanations regarding the understanding of the auditor's process when delivering audit judgment and decision making. This research is followed by a discussion of the role of basic emotions in generating audit judgment and decision making. The auditor then described, according to the seven basic emotions that are obtained through the result of a systematic literature review. This research also provides strategies that must be applied to conduct mindfulness audit judgment and decision making, which can help auditors navigate quickly and efficiently through the complex and risky world of auditing.

RESEARCH DESIGN AND METHODOLOGY

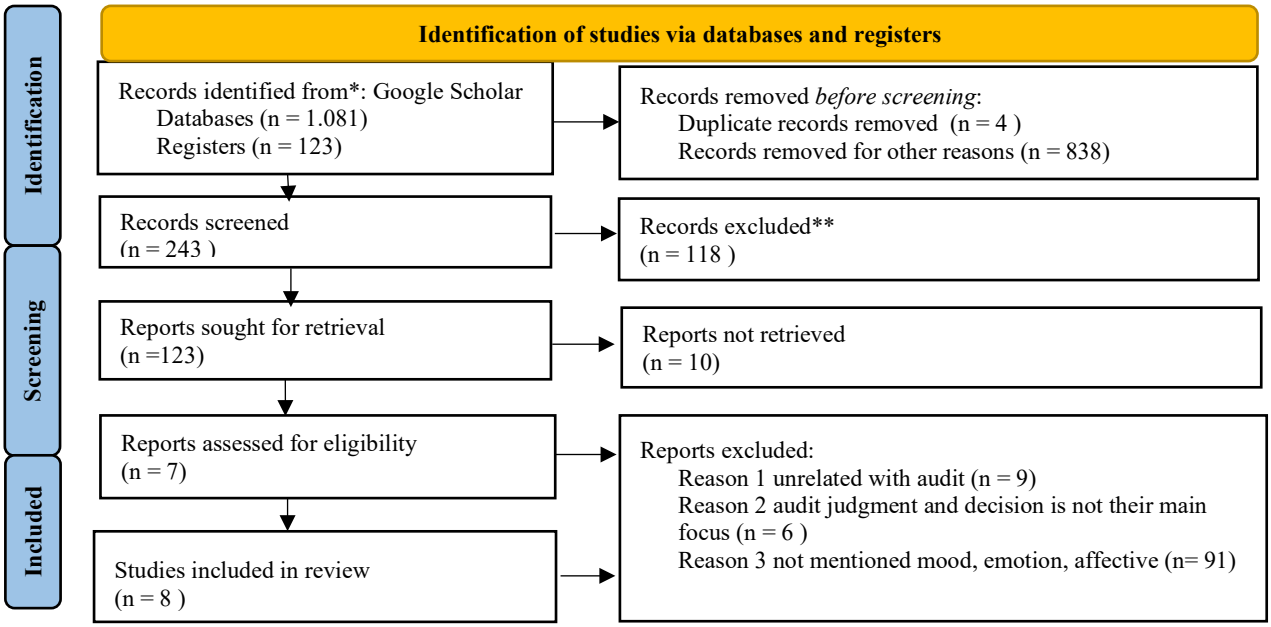
This research uses the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flow diagram (Page *et al.*, 2021) in conducting a systematic literature review to understand the relationship between audit judgment and decision making and affective neuroscience. The data collection process includes 3 (three) stages, namely collecting relevant articles, filtering studies, and systematic literature review.

In the first stage of data collection, articles with keywords queries audit judgment AND "decision" OR "mindful" OR "affective" OR "emotions" OR "mood" AND "neuroscience") which was obtained through Google Scholar. The total articles collected from the various queries used are 1.081 journals on Google Scholar according to the search using the query above. The Google Scholar database is used because it includes all articles from various publishers registered in 48 reputable journals. The selection of these journals uses methods and criteria that have also been used by Tank & Farrell (2021) because they are in the

two highest rankings of the classification of accounting and auditing journals in recent years through the journal rating system, namely: 2018 Chartered Association of Business Schools (CABS) Academic Journal Guide (AJG), 2015 German Academic Association of Business Research (Verband der Hochschullehrer für Betriebswirtschaft, or VHB JourQual, 2019 Australian Business Deans Council Master Journal List (ABDC) Journal Quality Review List.

Figure 1

Decision tree based on the PRISMA Flow Diagram



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
** Unregistered journals based on category in journal rank

The title and abstract of each article from Google Scholar have been screened and selected based on two criteria: the focus is on using the Affective Neuroscience point of view in the context of auditing, especially in audit judgment and decisions. From 123 registered journals, we re-screened titles and abstracts. There are only seven articles that specifically discuss audit judgment and decisions, mood, emotion, and affective. There are ninety-one journal articles that are not used in this research because they do not discuss audit judgment and decision making, affective neuroscience, mood, and emotion, which are part of affect as a major issue. The keyword searched through Google Scholar, namely the combination of Affective Neuroscience and judgment and decision making, could not be found. Then, the articles related to Affective Neuroscience, mindfulness, judgment, and decision making were searched manually from psychology journals, with as many as six articles. This study also includes 3 (three) other articles that can contribute to this literature review. There are 16 journals that we use in this Systematic Literature Review.

Table 1

Article used in systematic review

Categories	Related Articles
Audit judgment and decision, mood & emotion	Bhattacharjee & Moreno (2013); Chung et al. (2008); Yang et al. (2017); (Cianci & Bierstaker, 2009); (Clore and Huntsinger, 2007)
Audit judgment and decision, affective	Griffith et al. (2016); Bhattacharjee et al. (2012);
Audit judgment and decision, neuroscience	*Article not found. (N/A)*
Affective neuroscience, judgment, and decision, mindful	(Winkielman *et al.*, 2007); (Davis, Panksepp and Normansell, 2003); (Manfredi and Massardi, 2021); (Montag, Elhai and Davis, 2021); (Weber and Johnson, 2009); (Clore and Huntsinger, 2007)
Articles published by other publishers which are not mentioned in Table 1	(Finucane *et al.*, 2000); (Finucane, Peters and Slovic, 2012); (Keren, 1996);

RESULTS AND DISCUSSION

Audit judgment and decisions: What is change?

Entering the year 2000 onwards, research on audit judgment and decision making began to pay attention to affect, which has a significant influence in making auditor judgments and decisions. Griffith et al. (2016) stated that affect has various kinds of influences on auditor behaviour in providing judgments and decisions, where affect could be a signal to avoid or approach something. Auditors could avoid meeting face-to-face with clients who they find intimidating. Participants in good mood condition Cianci & Bierstaker (2009) tend to have high motivation and directed purpose to receive more favourable judgment of the client, but lower capacity than their counterparts who have a bad mood. This combination results in lower elaboration, which reduces the ability of an auditor in a good mood to justify and receive client judgments, which leads to the results in contrast to Chung et al. (2008), where an auditor in a bad mood makes judgments that are more favourable to the clients.

The trend of judgment and decision research shifted from the realm of psychology to social psychology, which from then until now has begun to look at audit judgment groups (Buchman, Tetlock and Reed, 1996; Seol, 2006; Trotman, Bauer and Humphreys, 2015). However, research on individual audit judgment and decisions is still interesting to do (Cianci et al., 2017; Kadous & Zhou, 2019; Nelson & Tan, 2005). The audit process requires the auditor's interaction with the other team members and parties related to the audit assignment. The result of audit judgment and decision is the result of the interaction of all audit members. Auditors carry out their audit duties by bringing their individual characteristics, namely ability, knowledge, and personality (Nelson & Tan, 2005).

Entering the year after 2010, the trend of audit judgment and decision making research still revolves around the cognitive domain, but Bhattacharjee and Moreno (2013) used emotion and mood when the auditors conduct audit judgments. Yang et al. (2017) used Emotional Intelligence to see its effect on the pressures faced by auditors (time budget pressure and client pressure) in providing their judgment. However, Emotional Intelligence here is treated as a moderator that can reduce auditors' dysfunctional behaviour. Research on audit judgment and decision making found throughout the year 2000 onwards, did not discuss much about the

affective role in auditor judgment and decisions. Previous research only discussed the impact of negative affect on auditor decisions and judgments and did not discuss how auditors manage their emotions (Yang, Brink and Wier, 2017). Whereas training on emotional management is very good for auditors, one way to do that is with self-awareness.

The research on judgment and decision making is also examined more specifically in every audit procedure that is carried out daily by auditors. For example, Bhattacharjee et al. (2012) examined how auditors give judgment on inventory accounts. As a result, when auditors have positive affective reactions towards clients with lower competence, auditors assess the possibility of inventory obsolescence, and this is like auditors receiving information from clients who have higher competence. The research of Chung et al. (2008) stated that mood can cause different judgments of inventory, but this experimental research used college students as respondents and only examined how mood will greatly affect inventory valuation, namely when a person's positive mood will make the highest judgment on inventory and vice versa if they have negative mood the valuation of the inventory is lower.

The Dominance of Cognitive Psychology Studies in Audit Judgment and Decision: A Cultural Influence

The research on audit judgment and decision making that has been published so far uses the cognitive rather than affective aspects to see how auditors produce judgment and decision making both in groups and individually. The literature review conducted from 1990 to 2020 has not changed much from audit judgment and decision making. Research on audit judgment and decision making published in reputable journals discusses more judgment and decision making in audit that must be fully rationalised, where the countries that become the location of the research prioritise cognitive rather than affective, especially in the realm of auditing research.

Figure 2

Number of articles based on country of publisher

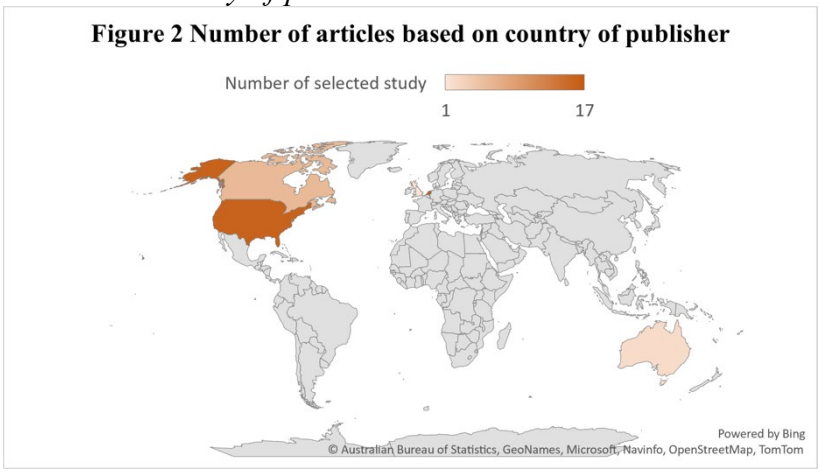


Figure 2 shows that the distribution of research on audit judgment and decision making is based on the country where these journals are published. Most of the locations where research is published are in developing countries, which, culturally, use logical and rational thinking in considering decisions. If we look from the point of view of Hofstede's Theory of Cultural Dimensions, we examine individualism and collectivism, which indeed affect how a person acts. No wonder, if, looking at the dominance of published research in Europe, America, and Australia, individualism is deeply rooted in the population of these countries.

Affective Neuroscience Premises

The limitation of the cognitive aspect has led to a revolution in affective, which is related to the understanding that affect and emotion have the same important role in human life. Affect has a key role in various theories of human behaviour, but it is rarely realised that affect is an important component in research and judgment and decision theory. (Finucane, Peters and Slovic, 2012). Zajonc (1980) argues that affective reactions to stimulus are often the first reactions, that occur automatically and subsequently guide the processing and judgment of information. The research that has been conducted regarding audit judgment and decision making used social theories, which contain assumptions about cognition, emotion, decision making and social behaviour. Affective neuroscience can support social theories by providing additional judgment from assumptions, especially in terms of decision making.

Affective neuroscience is a field of research that focuses on the neural basis of emotion and assumes a role of great relevance to emotion and affect in the modulation of cognition and behaviour. The recommended approach by Panksepp (1998: 52) is an attempt to understand, among others, (i) the origin of affective consciousness; (ii) how emotions and basic feelings are organised in the brain; and (iii) how the brain's basic emotional processing system produces feelings that are experienced internally. One of the main premises of Panksepp's affective neuroscience is that feelings support some unconditioned behavioural tendencies and play a key role in the formation of new unconscious behaviour by providing a mechanism that enables organisms to efficiently categorise world events to control future behaviour (Panksepp, 1998: 14). Affective Neuroscience aims to show that it is possible that many cognitive deficits could be corrected by addressing underlying emotions.

Basically, humans have 7 (seven) types of basic emotions that have existed since humans were born, namely *SEEKING* (expectations), *FEAR* (anxiety), *RAGE* (anger), *LUST* (sexuality), *CARE* (nurturing, *PANIC/GRIEF* (sadness), *PLAY* (socialisation) (Panksepp and Biven, 2012). This primal system is capitalised to provide specific nomenclature for the network of basic affective emotional actions that generate 'intentions in actions' and describe different states of feeling (Panksepp *et al.*, 2012). Panksepp (2006) proposed the relationship between the basic emotional system and emotional expression, as shown in Table 2, combined with emotion in the workplace, which was obtained through a survey in website application by Manfredi & Massardi (2021).

Various emotions may be experienced by auditors in carrying out the audit assignments, especially regarding audit procedures that require judgment and decision making. Auditors could experience various kinds of emotions and influences through the development of experiences, learning, relationships, cognitive development, and reflective functions, which make emotional life more complex. The basic emotional system forms more complex emotions, which can be said to be the important basic language for all living things.

Categorisation of emotion in the workplace using the basis of affective neuroscience when associated with organisations, which in this case, public accounting firms, could help detect emotional flows and improve the performance of individual auditors and teams. This method can also be used to analyse the development of emotions in the audit team and how these emotions may be elicited by work-related or non-work-related events.

Table 2

The relationship between basic emotional and emotional expression (Panksepp, 2006) can be found in the workplace.

Basic system emotional	Emotional expression	Emotion at work
SEEKING (+)	Interest, craving	Engaged
SEEKING (-)	Frustration	Frustrated, Bored
RAGE (+) (-)	Anger, Irritability, Contempt, Hatred	Angry
FEAR (-)	Simple anxiety, worry, Psychic trauma	Stressed
PANIC (-)	Separation distress, Sadness, Guilt/Shame, Shyness, Embarrassment	Sad, Isolated
PLAY (+)	Joy and gless, Happy playfulness	Playful, Happy
PASSION (+) (LUST)	Erotic feelings, jealousy	Exited
CARE (+)	Nurturance, Love, Attraction	Valued, confident

Source: Manfredi and Massardi (2021)

Affective Neuroscience in Auditors' Judgment and Decision Making

Seeing the dominance of research that puts forward cognition in judgment and decision making on audit provides room for judgment and decision-making research using an affective point of view. Affective neuroscience could support the auditor in making decisions and judgments that are not just assumptions but related to the auditor's social relationship with the environment.

Affect is considered by most contemporary theories as a post cognitive, that is, to occur only after considerable cognitive operations have been accomplished (Zajonc, 1980). The result of Zajonc's (1980) research showed that reliable affective discrimination (like-dislike ratings) can be made in the absence of recognition memory (old-new ratings). It is concluded that affect and cognition are under the control of separate and partially independent systems that can influence each other in various ways, and both are sources of independent effects in information processing.

Auditors cannot separate themselves from emotions. Intense feelings, referred to as affect, always appear in our consciousness from birth and are of various types. The relationship between auditor judgment and affective neuroscience, the auditors' thoughts could not be mapped like a machine, and therefore, their thoughts could not be explained by algorithms. Affective influence on judgment and decision making, according to Affect Regulation Models, occurs because people take actions to manage their emotional experiences (Winkielman *et al.*, 2007). There are some reasons people manage their emotions, namely automatically or for strategic reasons (Andrade, 2005), to restore previous emotional states, get into the emotional state that maximises performance and make their emotional state in accordance with situational demands. The literature on judgment and decision making has suggested that rational judgment and decision making are not always possible, so sometimes, individuals will rely on strategies that can simplify judgments and the decision making process (Cossette, 2014; Ceschi *et al.*, 2019).

Audit judgment and decision making of each auditor are certainly different because Affective Neuroscience helps our understanding of affective priming, namely, auditors record and process certain perceptual content differently. Affective priming could make auditors change their behaviours and react differently because of these affective priming stimuli. Most of the audit judgment and decision-making research that carries the cognitive theme, with affective neuroscience, can enrich our understanding of how cognition is integrated with emotion.

Catalogue of Auditors' Emotions

Table 2 explains basic emotions and how humans express them, especially in the workplace. In Table 2, basic emotions are categorised into seven, consisting of positive affect and negative affect. This affective labelling will assist the process of coding information that will provide benefits when the auditors undergo the training and practice. The auditors' work atmosphere can be more positive, and if the auditors face negative conditions, their affect can still be mitigated so that the resulting judgment can be accepted by the environment.

Table 3

Catalogue of auditor emotions in expression for judgment and decisions

Basic system emotions	Emotional expression (Emotion at work)	Findings in journals mention to affect and mood
Seeking	Interest, craving	"Auditors tend to tackle objective tasks before taking on more open, subjective tasks, perhaps for the satisfaction they get from completing the task (Mocadlo, 2021),."
		"Auditors rely on their liking for co-workers as a cue to accept co-workers' advice, regardless of its quality" (Kadous, Leiby and Peecher, 2013).
Fear	Anxiety	"Theory-based process model results show that inspections increase auditors' perceived inspection risks, which increase auditor effort for higher-risk clients, but also increase auditors' task-related **anxiety**, resulting in decreased decision performance for lower-risk clients" (Bhaskar, 2019).
Rage	Angry	*N/A*
Lust	Exited	*N/A*
Care	Valued, confidence	*N/A*
Panic/Grief	Sad, isolated	*N/A*
Play	Playful, happy	*N/A*

This research provides the catalogue of emotions based on Affective Neuroscience category, which was developed by Panksepp (2005), but there is not much research that discusses this type of emotion. This catalogue of emotions can be a preference for public accounting firms in knowing the situations faced by their auditors in various assignments and conditions and dealing with various clients. Not all types of emotions in the workplace can be obtained from the results of this literature review. Further research is needed to gain an understanding of the auditor's emotions in dealing with various situations when auditing.

Strategy in giving mindfulness audit judgment and decisions

Affect that arises because of cognition of emotional experiences becomes non adaptive when excessive in intensity, persists for a long time, appears unexpectedly, or does not fit the context of the situation (Phan & Sripada, 2013). Negative affect in the form of fear (anxiety) can affect the auditor when held accountable (Bhattacharjee and Moreno, 2013). Therefore, a strategy that allows individuals to regulate emotions more adaptively is needed. Emotion regulation can be understood as a conscious or unconscious intervention process on emotional

experiences that allows changes in experiences and affect expression from natural responses to other more effective responses (Gross and Thompson, 2007); Phan and Sripada, 2013). The failure of emotional regulation appears in various psychiatric disorders such as major depression, bipolar, anxiety, and borderline (Aldao, Nolen-Hoeksema and Schweizer, 2010).

Auditors need to understand and apply emotional regulation, especially when facing situations that are very mentally testing, but they must still give judgment and make decisions professionally. The emotional regulation strategy of Gross and Thompson (2007) model, which has been modified by Phan and Sripada (2013: 378), consists of three variants that can be used and adapted by auditors in providing mindfulness judgment and decision making. The antecedent based strategy consists of three variants, namely:

1. *Reappraisal*, involves changing the interpretation of the stimulus to change its affective effect. This strategy is effective because it involves the cognitive control for the representation of meaning from affective stimulus, so it reduces the amygdala activity. An example of using the reappraisal strategy is when the auditor hears negative comments from the teammates, it is interpreted and re-evaluated as a sign of insecurity, then the emotion that appears is not anger, but on the contrary, the auditor feels sorry for his colleague.
2. *Distraction*, namely by diverting concern or attention to different aspects of a stimulus to reduce its emotional impact. Diversion can be done physically (e.g., by closing the eyes) or mentally (e.g., by thinking about other things that have nothing to do with the stimulus).
3. *Suppression*, namely a cognitive modulation, physiological, or behavioural response to an affective stimulus. (Gross and Thompson, 2007). Suppression is an emotional regulation strategy that refers to various efforts made by a person to inhibit or change emotions that have peaked and emotional responses that have emerged (Gross, 2007). Different from reappraisal and distraction, suppression is carried out after the affective response is formed so that this regulation can increase activity in the amygdala and insula areas (Kim & Hamann, 2007).

The existing research on judgment and decision making are only examined the effect of negative affect (mood and emotion) on audit judgment and decision making in each audit procedure but does not explore more on how an auditor can manage their emotions when dealing with various situations. Premises in affective neuroscience that are often used in psychology should be used in audit judgment and decision making so that it is not meant to negate the role of cognitive process, but to make the roles of the two align with each other. This alignment can reduce auditor behaviour that could threaten audit quality. One of the possible way that can be done by the public accounting firm is supervisory coaching which may be this can be an effective technique in generating attention among staff-level auditors (Herda, Cannon and Randall, 2018).

Literature in a Grey Area

The search results using the category of reputable journal for the past twenty years still focus on mitigating bias towards cognitive behaviour of auditors when giving judgment and decision making. Articles that are in the grey area deserve to be considered to see the opportunities for further research.

Audit judgment and decision making done by each auditor are certainly different because, in affective neuroscience, it helps our understanding of affective priming, namely how auditors record and process certain perceptual content differently. Affective neuroscience helps us recognise seven basic human emotions, which then can be adapted into various expressions in the workplace. It is important for a public accounting firm to recognise their auditors' expressions (affect) each time they face various situations that rely

on negative or positive affect so that they can help the auditors in self-control so that they can respond to their emotions so that they are not excessive or reactive which can reduce threats to the quality of audit judgment and decision making, both those produced by individuals or by group judgment.

CONCLUSION

Auditors could experience various kinds of emotions and influences through the development of experiences, learning relationships, cognitive development, and reflective functions, which make emotional life more complex. The basic emotional system forms more complex emotions, which can be said to be an important basic language for all living things.

The opportunity for future research on audit judgment and decision making is still possible using inter-disciplined psychology that combines affective and cognitive aspects. Audit judgment and decision making are not only produced through a process that tends to be rational (cognitive) but also use positive and negative affect. This literature study provides a point of view that may need to be brought to the attention of auditors, academics, and service users of public accounting firms that the judgment and decision making given by the auditors come from a long process, and it is a combination of cognitive and affective. There is still not much research that discusses how auditors regulate their emotions to produce mindful judgment and decision making. This is something that needs to be considered in future research.

REFERENCES

Aldao, A., Nolen-Hoeksema, S. and Schweizer, S. (2010) 'Emotion-regulation strategies across psychopathology: A meta-analytic review', Clinical Psychology Review, 30(2), pp. 217-237. https://doi.org/10.1016/j.cpr.2009.11.004

Andrade, E. B. (2005) 'Behavioral consequences of affect: Combining evaluative and regulatory mechanisms', Journal of Consumer Research, 32(3), pp. 355-362 https://doi.org/10.1086/497546

Ashton, R. H. and Kennedy, J. (2002) 'Eliminating Recency with Self-Review: The Case of Auditors' "Going Concern" Judgments', Journal of Behavioral Decision Making, 15(3), pp. 221-231. https://doi.org/10.1002/bdm.412

Baumeister, R. F. and Leary, M. R. (1997) 'Writing Narative Literature Reviews - Bausmeister & Leary', Review of General Psychology, 1(3), pp. 311-320. https://doi.org/10.1037/1089-2680.1.3.311

Bell, T. B. (1997) 'Auditing organisations through a strategic-systems lens : the KPMG Business Measurement Process', in.

Bhaskar, L. S. (2019) 'How do Risk-Based Inspections Impact Auditor Behavior? Experimental Evidence on the PCAOB's Process', The Accounting Review, 95(4), pp. 103-126. https://doi.org/10.2308/tar-2016-0007

Bhattacharjee, S. and Moreno, K. (2002) 'The Impact of Affective Information on the Professional Judgments of More Experienced and Less Experienced Auditors', Journal of Behavioral Decision Making, 15(4), pp. 361-377.
https://doi.org/10.1002/bdm.420

Bhattacharjee, S. and Moreno, K. K. (2013) 'The role of auditors' emotions and moods on audit judgment: A research summary with suggested practice implications', Current Issues in Auditing, 7(2), pp. 1-8.
https://doi.org/10.2308/ciia-50565

Bhattacharjee, S., Moreno, K. K. and Riley, T. (2012) 'The Interplay of Interpersonal Affect and Source Reliability on Auditors' Inventory Judgmentś', Contemporary Accounting Research, 29(4), pp. 1087-1108.
https://doi.org/10.1111/j.1911-3846.2011.01139.x

Bonner, S. E. (1999) 'Judgment and decision-making research in accounting', Accounting Horizons, 13(4), pp. 385-398.
https://doi.org/10.2308/acch.1999.13.4.385

Brown, G. A., Collins, R. and Thornton, D. B. (1993) 'Professional Judgment and Accounting Standards', Accounting, Organizations and Society, 18(4), pp. 275-289.
https://doi.org/10.1016/0361-3682(93)90017-Z

Buchman, T. A., Tetlock, P. E. and Reed, R. O. (1996) 'Accountability and auditors' judgments about contingent events', Journal of Business Finance and Accounting, 23(3), pp. 379-398.
https://doi.org/10.1111/j.1468-5957.1996.tb01128.x

Ceschi, A. et al. (2019) 'Dimensions of decision-making: An evidence-based classification of heuristics and biases', Personality and Individual Differences, 146(July), pp. 188-200
https://doi.org/10.1016/j.paid.2018.07.033

Chang, C. J. and Luo, Y. (2021) 'Data visualisation and cognitive biases in audits', Managerial Auditing Journal, 36(1), pp. 1-16.
https://doi.org/10.1108/MAJ-08-2017-1637

Choo, F. (1996) 'Auditors' knowledge content and judgment performance: A cognitive script approach', Accounting, Organizations and Society, 21(4), pp. 339-359.
https://doi.org/10.1016/0361-3682(95)00048-8

Chung, J. O. Y., Cohen, J. R. and Monroe, G. S. (2008) 'The effect of moods on auditors' inventory valuation decisions', AUDITING: A Journal of Practice & Theory, 27(2), pp. 137-159.
https://doi.org/10.2308/aud.2008.27.2.137

Cianci, A. M. et al. (2017) 'Audit partner identification: Unintended consequences on audit judgment', AUDITING: A Journal of Practice & Theory, 36(4), pp. 135-149. https://doi.org/10.2308/ajpt-51629

Cianci, A M and Bierstaker, J. (2009) 'The impact of positive and negative affect on auditors' cognitive and ethical judgments', Auditing: A Journal of Practice and Theory, 28, pp. 119-145. https://doi.org/10.2308/aud.2009.28.2.119

Cianci, Anna M and Bierstaker, J. L. (2009) 'The Impact of Positive and Negative Mood on the Hypothesis Generation and Ethical Judgments of Auditors', Lloydia (Cincinnati), 28(2), pp. 119-144. https://doi.org/10.2308/aud.2009.28.2.119

Clore, G. L. and Huntsinger, J. R. (2007) 'How emotions inform judgment and regulate thought', Trends in Cognitive Sciences, 11(9), pp. 393-399. https://doi.org/10.1016/j.tics.2007.08.005

Cossette, P. (2014) 'Heuristics and cognitive biases in entrepreneurs: a review of the research', Journal of Small Business and Entrepreneurship, 27(5), pp. 471-496. https://doi.org/10.1080/08276331.2015.1105732

Cyr, D., Héroux, S. and Fontaine, R. (2020) 'Auditors' judgment subordination and the theory of planned behavior', Managerial Auditing Journal, 35(8), pp. 1189-1211. https://doi.org/10.1108/MAJ-12-2018-2110

Davis, K. L., Panksepp, J. and Normansell, L. (2003) 'The Affective Neuroscience Personality Scales: Normative Data and Implications', Neuropsychoanalysis, 5(1), pp. 57-69. https://doi.org/10.1080/15294145.2003.10773410

Eilifsen, A., Kochetova, N. and Messier, W. F. (2019) Mitigating the dilution effect in auditors' judgments using a frequency response mode, Behavioral Research in Accounting. https://doi.org/10.2308/bria-52467

Eutsler, J., Norris, A. and Trompeter, G. (2017) 'A Live Simulation-Based Investigation: Interactions with Clients and Their Effect on Audit Judgment and Professional Skepticism', AUDITING: A Journal of Practice & Theory, 37. https://doi.org/10.2308/ajpt-51880

Finucane, M. L. et al. (2000) 'The Affect Heuristic in Judgments of Risks and Benefits', Journal of Behavioral Decision Making, 17, pp. 1-17. https://doi.org/10.1002/(SICI)1099-0771(200001/03)13:1<1::AID-BDM333>3.0.CO;2-S

Finucane, M. L., Peters, E. and Slovic, P. (2012) Judgment and Decision Making: The Dance of Affect and Reason, Emerging Perspectives on Judgment and Decision Research. https://doi.org/10.1017/CBO9780511609978.012

Garcia, A. and Herrbach, O. (2010) 'Organisational commitment, role tension and affective states in audit firms', Managerial Auditing Journal, 25(3), pp. 226-239. https://doi.org/10.1108/02686901011026332

Gibbins, M. (1984) 'Propositions about the Psychology of Professional Judgment in Public Accounting', Journal of Accounting Research, 22(1), p. 103. https://doi.org/10.2307/2490703

Griffith, E. E., Kadous, K. and Young, D. (2016) 'How insights from the "New" JDM research can improve auditor judgment: Fundamental research questions and methodological advice', Auditing, 35(2), pp. 1-22. https://doi.org/10.2308/ajpt-51347

Gross, J. J. (2007) Handbook of emotion regulation. New York: The Guilford Press. Available at: http://hdl.handle.net/20.500.12210/32061.

Gross, J. J. and Thompson, R. A. (2007) Emotion regulation: Conceptual foundations in Handbook of emotion regulation. The Guildford Press.

Hamdam, A. et al. (2022) 'Auditor judgment and decision-making in big data environment: a proposed research framework', Accounting Research Journal, 35(1), pp. 55-70. https://doi.org/10.1108/ARJ-04-2020-0078

Herda, D., Cannon, N. and Randall, F. (2018) 'Workplace Mindfulness and its Effect on Staff Auditors' Audit Quality-Threatening Behavior', Behavioral Research in Accounting, 31(1). https://doi.org/10.2308/bria-52215

Johnson, P. E., Jamal, K. and Glen Berryman, R. (1989) 'Audit judgment research', Accounting, Organizations and Society, 14(1-2), pp. 83-99. https://doi.org/10.1016/0361-3682(89)90035-4

Kadous, K., Leiby, J. and Peecher, M. E. (2013) 'How do auditors weight informal contrary advice? The joint influence of advisor social bond and advice justifiability', Accounting Review, 88(6), pp. 2061-2087. https://doi.org/10.2308/accr-50529

Kadous, K. and Zhou, Y. (Daniel) (2019) 'How Does Intrinsic Motivation Improve Auditor Judgment in Complex Audit Tasks?', Contemporary Accounting Research, 36(1), pp. 108-131. https://doi.org/10.1111/1911-3846.12431

Kent, P. and Weber, R. (1998) 'Auditor expertise and the estimation of dollar error in accounts', Abacus, 34(1), pp. 120-139. https://doi.org/10.1111/1467-6281.00025

Keren, G. (1996) 'Perspectives of behavioral decision making: Some critical notes', Organizational Behavior and Human Decision Processes, 65(3), pp. 169-178. https://doi.org/10.1006/obhd.1996.0016

van Kuijck, B. and Paresi, V. (2020) 'Personality of internal auditors; an exploratory study in The Netherlands', Maandblad Voor Accountancy en Bedrijfseconomie, 94(3/4), pp. 113-125. https://doi.org/10.5117/mab.94.47818

Kunda, Z. (1999) Social Cognition: Making Sense of People. United States of America: The MIT Press. https://doi.org/10.7551/mitpress/6291.001.0001

Lambert, T. A. and Peytcheva, M. (2020) 'When Is the Averaging Effect Present in Auditor Judgments?', Contemporary Accounting Research, 37(1), pp. 277-296. https://doi.org/10.1111/1911-3846.12512

Lehmann, C. M. and Norman, C. S. (2006) 'The Effects of Experience on Complex Problem Representation and Judgment In Auditing: An Experimental Investigation', Behavioral Research in Accounting, 18(1), pp. 65-83. https://doi.org/10.2308/bria.2006.18.1.65

Mactavish, C., McCracken, S. and Schmidt, R. N. (2018) 'External Auditors' Judgment and Decision Making: An Audit Process Task Analysis', Accounting Perspectives, 17(3), pp. 387-426. https://doi.org/10.1111/1911-3838.12182

Mala, R. and Chand, P. (2015) 'Judgment and decision-making research in auditing and accounting: Future research implications of person, task, and environment perspective', Accounting Perspectives, 14(1), pp. 1-50. https://doi.org/10.1111/1911-3838.12040

Manfredi, P. and Massardi, E. (2021) 'Affective Neuroscience: The Suitability of a Web App to Monitor Affective States at Work', Frontiers in Psychology, 12(June), pp. 1-13. https://doi.org/10.3389/fpsyg.2021.592143

Maradona, A. F. (2020) 'A Qualitative Exploration of Heuristics and Cognitive Biases in Auditor Judgements', Accountability, 9(2), p. 94. https://doi.org/10.32400/ja.30634.9.2.2020.94-112

McNellis, C. J., Sweeney, J. T. and Dalton, K. C. (2021) 'The Impact of Requiring Audit Documentation on Judgments of Audit Quality and Auditor Responsibility', in Karim, K. E. et al. (eds) Advances in Accounting Behavioral Research. Emerald Publishing Limited (Advances in Accounting Behavioural Research), pp. 87-116. https://doi.org/10.1108/S1475-148820200000024004

Miledi, A. (2021) 'The construction of audit partner's judgment', Journal of Financial Reporting and Accounting, ahead-of-p(ahead-of-print)..
https://doi.org/10.1108/JFRA-03-2020-0087

Mocadlo, R. P. (2021) 'How Do Auditors Order Their Tasks, and How Does Task Ordering Affect Performance Under Time Pressure?', Behavioral Research in Accounting, 34(1), pp. 93-111.
https://doi.org/10.2308/BRIA-19-039

Montag, C., Elhai, J. D. and Davis, K. L. (2021) 'A comprehensive review of studies using the Affective Neuroscience Personality Scales in the psychological and psychiatric sciences', Neuroscience and Biobehavioral Reviews, 125(July 2020), pp. 160-167.
https://doi.org/10.1016/j.neubiorev.2021.02.019

Nelson, I. T. et al. (2003) 'Teaching logic to auditing students: Can training in logic reduce audit judgment errors?', Journal of Accounting Education, 21(3), pp. 215-237.
https://doi.org/10.1016/S0748-5751(03)00027-7

Nelson, M. W. and Tan, H. (2005) 'Judgment and Decision Making Research in Auditing: A Task, Person, and Interpersonal Interpersonal Perspective', Auditing, 24(Supplement), pp. 41-71.
https://doi.org/10.2308/aud.2005.24.Supplement.41

Page, M. J. et al. (2021) 'The PRISMA 2020 statement: An updated guideline for reporting systematic reviews', The BMJ, 372.
https://doi.org/10.1136/bmj.n71

Panksepp, J. (2005) Affective Neuroscience, the Foundations of Human and Animal Emotions. New York, USA: Oxford University Press, Inc.

Panksepp, J. (2006) 'Emotional endophenotypes in evolutionary psychiatry', Progress in Neuro-Psychopharmacology and Biological Psychiatry, 30(5), pp. 774-784.
https://doi.org/10.1016/j.pnpbp.2006.01.004

Panksepp, J. (2011) 'Cross-Species affective neuroscience decoding of the primal affective experiences of humans and related animals', PLoS ONE, 6(9).
https://doi.org/10.1371/journal.pone.0021236

Panksepp, J. et al. (2012) 'The philosophical implications of affective neuroscience', Journal of Consciousness Studies, 19(3-4), pp. 6-48.

Panksepp, J. and Biven, L. (2012) The Archaeology of Mind: Neuroevolutionary Origins of Human Emotion. New York: W.W. Norton & Company.

Peytcheva, M. and Gillett, P. R. (2011) 'How partners' views influence auditor judgment', Auditing, 30(4), pp. 285-301..
https://doi.org/10.2308/ajpt-10170

Phan, H. T. et al. (2021) 'Effect of emotional intelligence on auditors' judgment and audit sustainability: Empirical evidence from Vietnam', Problems and Perspectives in Management, 19(2), pp. 333-345.
https://doi.org/10.21511/ppm.19(2).2021.27

Phan, K. L. and Sripada, C. S. (2013) 'Emotion regulation.', in The Cambridge handbook of human affective neuroscience. New York, NY, US: Cambridge University Press, pp. 375-400.
https://doi.org/10.1017/CBO9780511843716.020

Ratzinger-Sakel, N. V. S. and Theis, J. C. (2019) 'Does considering key audit matters affect auditor judgment performance?', Corporate Ownership and Control, 17(1), pp. 196-210.
https://doi.org/10.22495/cocv17i1siart4

Robertson, J. C. (2010) 'The effects of ingratiation and client incentive on auditor judgment', Behavioral Research in Accounting, 22(2), pp. 69-86.
https://doi.org/10.2308/bria.2010.22.2.69

Saputra, K. A. K., Ketut Jayawarsa, A. A., & Priliandani, N. I. (2022). Antonio Gramsci Hegemonical Theory Critical Study: Accounting Fraud of Hindu-Bali. International Journal of Business, 27(2).
https://doi.org/10.55802/IJB.027(2).001

Saputra, K. A. K., Mu'ah, M., Jurana, J., Korompis, C. W. M., & Manurung, D. T. (2022). Fraud Prevention Determinants: A Balinese Cultural Overview. Australasian Accounting, Business and Finance Journal, 16(3), 167-181.
https://doi.org/10.14453/aabfj.v16i3.11

Schafer, B. A. and Schafer, J. K. (2018) 'Interpersonal Affect, Accountability and Experience in Auditor Fraud Risk Judgments and the Processing of Fraud Cues', Advances in Accounting Behavioural Research, 22, pp. 43-65.
https://doi.org/10.1108/S1475-148820190000022004

Schmutte, J. and Duncan, J. R. (2009) Professional judgment: A Model for Accounting and Auditing Decisions.
https://doi.org/10.18848/1447-9508/CGP/v09i09/43337

Seol, I. (2006) 'The effect of auditor interaction on decision making in the going-concern task', Managerial Auditing Journal, 21(6), pp. 582-597.
https://doi.org/10.1108/02686900610674870

Siddaway, A. P., Wood, A. M. and Hedges, L. V. (2019) 'How to Do a Systematic Review: A Best Practice Guide for Conducting and Reporting Narrative Reviews, Meta-Analyses, and Meta-Syntheses', Annual Review of Psychology, 70(1), pp. 747-770.
https://doi.org/10.1146/annurev-psych-010418-102803

Solomon, I. and Trotman, K. T. (2003) 'Experimental judgement and decision reseach in auditing: The first 25 years of AOS', Accounting, Organizations and Society, 28(4), pp. 395-412.
https://doi.org/10.1016/S0361-3682(02)00023-5

Susanto, D. S. et al. (2019) 'Judgment State Auditor on Audit Opinion for Government Financial Statement with Perspective Hermeneutic Phenomenology', The International Journal of Accounting and Business Society, 27(2), pp. 27-54.
https://doi.org/10.21776/ub.ijabs.2019.27.2.2

Tank, A. K. and Farrell, A. M. (2021) 'Is Neuroaccounting Taking a Place on the Stage? A Review of the Influence of Neuroscience on Accounting Research', European Accounting Review, 0(0), pp. 1-35.
https://doi.org/10.1080/09638180.2020.1866634

Trotman, K. T., Bauer, T. D. and Humphreys, K. A. (2015) 'Group judgment and decision making in auditing: Past and future research', Accounting, Organizations and Society, 47, pp. 56-72.
https://doi.org/10.1016/j.aos.2015.09.004

Tsunogaya, N., Sugahara, S. and Chand, P. (2016) 'Judgments of Auditors on "Principles" versus "Guidance" in Lease Accounting Standard: Evidence from Japan', Asian Review of Accounting, 24(3), pp. 83-105. Available at:
https://doi.org/10.1108/ARA-09-2014-0101

Waymire, G. B. (2014) 'Neuroscience and ultimate causation in accounting research', Accounting Review, 89(6), pp. 2011-2019.
https://doi.org/10.2308/accr-50881

Weber, E. U. and Johnson, E. J. (2009) 'Mindful judgment and decision making', Annual Review of Psychology, 60, pp. 53-85.
https://doi.org/10.1146/annurev.psych.60.110707.163633

Winkielman, P. et al. (2007) 'Affective Influence on Judgments and Decisions: Moving Towards Core Mechanisms', Review of General Psychology, 11(2), pp. 179-192.
https://doi.org/10.1037/1089-2680.11.2.179

Yang, L., Brink, A. G. and Wier, B. (2017) 'The impact of emotional intelligence on auditor judgment', International Journal of Auditing, 22(1), pp. 83-97.
https://doi.org/10.1111/ijau.12106

Zajonc, R. B. (1980) 'Feeling and thinking: Preferences need no inferences', American Psychologist, 35(2), pp. 151-175.
https://doi.org/10.1037/0003-066X.35.2.151